



Study supporting the final evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²)

Final Study



Written by:
CEPS
July 2021

EUROPEAN COMMISSION

Directorate-General for Informatics
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*European Commission
B-1049 Brussels*

**Study supporting the final evaluation of the
programme on interoperability solutions for
European public administrations, businesses
and citizens (ISA²)**

Final Study

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Luxembourg: Publications Office of the European Union, 2021

ISBN 978-92-76-38406-9

DOI 10.2799/94683

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List of acronyms, abbreviations and terms used in the report

ADMS	Asset Description Metadata Schema
AI	Artificial Intelligence
CEF	Connecting Europe Facility
CEPS	Centre for European Policy Studies
CPSV-AP	Core Public Service Vocabulary Application Profile
DCAT-AP	Data Catalogue Vocabulary Application Profile for Data Portals in Europe
DG	Directorate-General
DG DIGIT	Directorate-General for Informatics
DIGIT.D2	Directorate-General for Informatics, Directorate D Digital Services, Unit D2 Interoperability
DSM	Digital Single Market
EC	European Commission
EEA	European Economic Area
EIA	European Interoperability Architecture
EIC/EICart	European Interoperability Cartography
eIDAS	Electronic Identification and Trust Services
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture
EIS	European Interoperability Strategy
ELISE	European Location Interoperability Solutions for e-Government
ERDF	European Regional Development Fund
EU	European Union
EVM	Earned Value Management
GDPR	General Data Protection Regulation
HORIZON 2020	The EU funding programme for research and innovation
IAP	Interoperability Action Plan
ICT	Information communication technology
IDA	Interchange of data between administrations
IDABC	Interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens
IMAPS	Interoperability Maturity Assessment of a Public Service
ISA	Programme on interoperability solutions for European public administrations
ISA ²	Programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens
ISA ² Decision	L 318/1 Decision (EU) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA ² programme) as a means for modernising the public sector, Brussels 4.12.2015.
ISA ² Proposal	European Commission (2014), Proposal for a Decision of the European Parliament and of the Council establishing a programme on interoperability solutions for European public administrations, businesses and citizens (ISA ²) – Interoperability as a means for modernising the public sector, COM(2014) 357 final.
IT	Information Technology
NGOs	Non-governmental organisations
NIFs	National Interoperability Frameworks
NIFO	National Interoperability Framework Observatory
OECD	Organisation for Economic Co-operation and Development
PMKI	Public Multilingual Knowledge Management Infrastructure
REFIT	The Regulatory Fitness and Performance programme of the European Commission
SDG	Single Digital Gateway
SPI	Schedule Performance Index
SCM	Standard Cost Model
SRSP	Structural Reform Support Programme
sTESTA	Secure Trans European Services for Telematics between Administrations
Study	The Study supporting the final evaluation of the ISA ² programme
Study Team	Team of researchers led by CEPS
TSI	Technical Support Instrument

Executive summary

Background

ISA² (Interoperability Solution for public administrations, businesses and citizens) was a spending programme of the European Union (EU) that supported the development of digital solutions, which enable public administrations, businesses and citizens in Europe to benefit from **interoperable cross-border and cross-sector public services**. With a budget of €131 million, ISA² was one of the main instruments supporting and promoting **public sector interoperability between 2016 and 2020**.

This independent Study supports the final evaluation of the programme, thus helping fulfil the legal obligation of evaluating the performance of the programme, by 31 December 2021, stipulated in the ISA² Decision¹. In addition, the Study helps inform future measures in the field of interoperability, particularly the implementation of the [Digital Europe Programme](#) and the development of a new interoperability policy for the EU's public sector². The Study was performed between September 2020 and June 2021 and considered seven evaluation criteria: relevance, effectiveness, efficiency, coherence, EU added value, utility and sustainability. The analysis in this Study is based on primary data collected from 102 stakeholders who replied to the targeted or public consultation, as well as secondary data such as publicly available sources (e.g. the [ISA² website](#) and [Joinup](#)), operational documents of the programme, relevant policy documents and relevant literature in the field of interoperability. In addition, five independent expert assessments complemented the analysis.

Main results

Throughout its existence, the ISA² programme brought benefits across multiple areas, contributing to developing and supporting digital solutions, frameworks and specifications to enhance the interoperability of public services in the EU. While the evaluation is **generally positive, areas of improvement remain** to support the digitalisation and interoperability of the EU's public sector at all levels. Moreover, given the ambitions of the EU's digital agenda for the coming years, it is essential to build on the achievements of ISA² and improve on the shortcomings in order to ensure that the ambitions are met.

The programme, through its objectives, remained relevant in the context of evolving needs and problems. Several needs have become more relevant, particularly in the context of the COVID-19 pandemic, including the need for coordination when implementing digital solutions.

In terms of **effectiveness**, the ISA² programme achieved its objectives to some extent. The main achievements of ISA² consist in the support to the implementation of EU policies and actions through interoperability solutions, the facilitation of the re-use of interoperability solutions, and the contribution to the promotion of a holistic approach to interoperability in the EU. The programme responded to the need of public administrations for common interoperable tools, helping public administrations mitigate their budgetary constraints to a certain extent through the solutions provided. Conversely, the take-up of solutions could be further increased by ensuring clear dissemination, providing one-stop-shop solutions that allow users to clearly see and access available resources, and focusing on a smaller set of actions and solutions and bringing them to maturity.

¹ Article 13 of [Decision \(EU\) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens \(ISA² programme\) as a means for modernising the public sector, Brussels 4.12.2015](#).

² For further details please see: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12579-Interoperable-digital-public-services-European-Interoperability-Framework-evaluation-&-strategy_en

There are also **additional areas for future improvement**. First, there is a need for more metrics and methodologies to assess cost-savings stemming from the use of interoperable solutions, as well as their more qualitative impacts. A more comprehensive overview of the impacts of interoperable solutions could be gained by using a common methodological approach to identifying benefits in the form of cost-savings or benefits in the form of, for instance, improved quality of services and more user-friendliness. Second, with an ever-evolving legislative landscape, the recent work done under the ISA² programme to identify legislation gaps hampering cross-border and cross-sectoral interoperability should be continued in the future to keep up with changes and deliver more results.

From the point of view of **efficiency**, the **work across ISA² packages progressed within the planned time and budget**. Final work is being undertaken in 2021 to bring the activities of the programme to an end and facilitate the transition to the Digital Europe Programme. In terms of cost-effectiveness, an analysis of packages with comparable indicators for the sampled actions shows that the benefits are greater than the costs for the ultimate beneficiaries of the solutions developed. In addition, the **process of selecting actions** to be included in the rolling work programme is deemed to have been **relatively fit for purpose**.

In terms of the **internal coherence** of ISA², there were synergies between the actions of the programme to some extent and overlaps remained limited. Nevertheless, the fragmentation of the programme into multiple different actions may have impinged on fully tapping all potential synergies. When it comes to the **external coherence** with other policies, programmes, and initiatives, ISA² was particularly synergetic with the Connecting Europe Facility (CEF), the Single Digital Gateway (SDG), and European Regional Development Fund (ERDF). Overlaps remained relatively limited, but they could appear between ISA² and funding instruments for public sector modernisation and digitalisation.

The ISA² programme provided **clear EU added value**, as national or sub-national initiatives alone would have made only limited contributions towards most of the objectives. In addition, ISA² achieved its objectives at a **lower cost** than that of national or sub-national interventions.

Turning to the **utility** of the programme, ISA² solutions contributed to some extent to the main needs and problems experienced by stakeholders. **Areas of improvement concerning the utility of the programme include**: i) concentrating the efforts on critical priorities and user needs to **increase user satisfaction**; ii) developing fewer, but more mature tools; iii) **working more closely with the Member States** and iv) **better engaging users**.

Lastly, the **sustainability of the programme's results depends significantly on the type of outputs** and the required level of maintenance and updating. Solutions in the form of guidelines and specifications can remain as a reference point and may require updating to keep up with developments in the field, but software solutions will likely require more frequent maintenance and support for them to remain accessible and useful. **Cost recovery options** such as introducing a fee for accessing solutions are not expected to be feasible.

Final Study

Introduction

The ISA² programme - Interoperability solutions for public administration, businesses and citizens – aimed to **support the digital transformation of the public sector** by providing digital solutions that enable public administrations, citizens, and businesses across the EU to reap the benefits of interoperable cross-border and cross-sector public services. The programme was operational from 1 January 2016 until 31 December 2020 with a total budget of € 131 million distributed over the five-year period.

Digitalisation holds great promise for the future of public services and the public sector. However, its potential cannot be tapped without a **key enabler: interoperability**. ISA² has been part of the **wider picture of EU-level initiatives** to support public sector digitalisation across the Union, including initiatives such as the CEF, the SDG, the Structural Reform and Support Programme, and policy ambitions such as the Digital Single Market (DSM) Strategy and the eGovernment action plans. Importantly, looking towards the future, **interoperability is set to continue to play a key enabler role in the digital agenda**. The ambitions are high and enhanced interoperability will be necessary across policy areas, government levels and borders to support, for instance, the development of the common European data spaces,³ as well as to reach the targets set for the digital agenda over the next decade.⁴ Beyond the policy context, the **Covid-19 pandemic** put even more emphasis on the need to tap the opportunities of digital solutions for the public sector in order to tackle unexpected shocks with serious reverberations in our economy and society, while improving the interactions between stakeholders of public services. Against this background, **taking stock of the achievements of ISA² and drawing the right lessons** is crucial in order to define the right next steps.

This Study presents the **results of the independent assessment supporting the final evaluation of the programme**, having a twofold role. First, the Study helps fulfil the legal obligation of evaluating the performance of the programme by 31 December 2021, stipulated in the ISA² Decision.⁵ Second, it helps inform future measures in the field of interoperability, particularly the implementation of the [Digital Europe Programme](#) and the development of [a new interoperability policy](#) for the EU's public sector.

The independent assessment was carried out between September 2020 and June 2021 by a team of researchers led by the Centre for European Policy Studies (CEPS), in line with the requirements comprised in the Request for Services issued by the European Commission – DG DIGIT – DIGIT.D2 - Interoperability (DIGIT.D2).

The analysis presented in this Study is based **on a set of evaluation criteria and evaluation questions** forming the **Evaluation Framework**, which has served as the basis for the process. The evaluation criteria and questions applied in this Study are (the full Evaluation Framework can be consulted in Annex F):

³ The common European data spaces include a data space for public administrations, alongside eight other data spaces, as described in the 2020 Communication "A European Strategy for Data" (see COM(2020) 66 final, European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A European strategy for data).

⁴ COM(2021) 118 final Communication from the Commission To The European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions "2030 Digital Compass: the European way for the Digital Decade"

⁵ Article 13 of Decision (EU) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA² programme) as a means for modernising the public sector, Brussels 4.12.2015.

- **The relevance criterion** checks whether the rationales underlying the programme are still appropriate or require revisions to take into account changing needs and problems. The connected evaluation question is:
 - **Evaluation question 1:** To what extent are the objectives of the ISA² programme still pertinent in relation to the evolving needs and problems at both national and EU levels?
- **The effectiveness criterion** indicates the extent to which the ISA² programme has met the objectives that it was intended to achieve and generated the benefits that it was intended to produce. The connected evaluation questions are:
 - Evaluation question 2: To what extent has the ISA² programme achieved its objectives – with special focus on the re-use of interoperability solutions across the Union and paying particular attention to the needs expressed by the European public administrations?
 - Evaluation question 3: Are there aspects (e.g., objectives, actions) that are more or less effective than others, and if so, what lessons can be drawn from this?
- **The efficiency criterion** looks into costs borne by various stakeholders to achieve the objectives/benefits discussed under the effectiveness criterion. The connected evaluation questions are:
 - Evaluation question 4: To what extent has the programme been cost-effective? How is the programme performing relative to the planned work and budget?
 - Evaluation question 5: Which aspects of the programme are the most efficient or inefficient, especially in terms of resources mobilised?
- **The coherence criterion** is a measure of the degree to which the ISA² programme and interventions supported by such programme are consistent among each other (so-called 'internal coherence') and with the EU policy framework at large (so-called 'external coherence'), in particular with EU interventions with similar objectives and global initiatives in the field. The connected evaluation questions are:
 - Evaluation question 6: To what extent do the ISA² actions form part of a "holistic" approach within the framework of the programme? (internal coherence)
 - Evaluation question 7: To what extent is the ISA² programme coherent with other EU interventions which have similar objectives and with global initiatives in the same field? (external coherence)
- **The EU added value criterion** refers to an assessment of the additional impacts generated by the ISA² programme at the EU level, as opposed to leaving the subject matter in the hands of Member States (including regional or local entities where relevant). The connected evaluation question is:
 - Evaluation question 8: What is the additional value resulting from the ISA² programme, compared to what could reasonably have been expected from Member States acting at national, regional and/or local levels?

In addition, as requested by Article 13(4) of the ISA² Decision, two additional criteria are included in the Evaluation Framework:

- **The utility criterion**, measuring the extent to which the results generated by ISA² satisfy stakeholders' needs and the differing levels of satisfaction among different stakeholder groups (e.g., public administrations, businesses, citizens). The connected evaluation question is:
 - Evaluation question 9: How do the ISA² programme's actions and results, achieved and anticipated, compare with the needs they are supposed to address?

- **The sustainability criterion**, measuring the likelihood of the results of ISA² lasting beyond the completion of the programme. The connected evaluation question is:
 - o Evaluation question 10: To what extent is the financial, technical and operational sustainability of the developed solutions – maintained and operated through the ISA² Programme –ensured?

This Study is organised as follows:

- Chapter 1 introduces the policy context in which the ISA² programme and its evaluation must be considered, presents the ISA² programme and discusses the intervention logic, which is further detailed in Annex E;
- Chapter 2 provides an overview of the main elements of the programme and its implementation;
- Chapter 3 describes the different data sources and the methodology followed to carry out the evaluation, as well as the main limitations of the analysis;
- Chapter 4 to 10 present the main evidence and results supporting the final evaluation of the programme based on the seven evaluation criteria:
 - i) Relevance (Chapter 4);
 - ii) Effectiveness (Chapter 5);
 - iii) Efficiency (Chapter 6);
 - iv) Coherence (Chapter 7);
 - v) EU added value (Chapter 8);
 - vi) Utility (Chapter 9);
 - vii) Sustainability (Chapter 10).

Each chapter presents the key findings, an introduction to the evaluation approach utilised based on the evaluation framework and an in-depth analysis of the results for the specific criterion.

- Chapter 11 provides concluding remarks.

To further support the analysis, the report contains the following seven annexes:

- Annex A presents the Synopsis report of the consultation activities, detailing the key elements of the consultations conducted and key feedback from the consulted stakeholders;
- Annex B explains the differences in stakeholders' groupings between the interim and the final evaluation of the ISA² programme;
- Annex C visualises the stakeholders' feedback by type of consultation;
- Annex D offers a factual summary of the public consultation;
- Annex E discusses the intervention logic of the programme;
- Annex F details the evaluation framework utilised to perform the evaluation; and
- Annex G provides supporting evidence for the final evaluation of the ISA² programme.

1 Background of the intervention

This Chapter first presents an overview of the evolving policy context in which ISA² was implemented between 2016 and 2020 and provides a forward-looking perspective on the key developments in the digital agenda of the EU in which interoperability will play an important role over the next several years. Against this background, the Chapter then introduces the main features of the ISA² programme and how they relate to the policy context. Finally, this Chapter outlines the intervention logic of ISA², which serves as the methodological guideline throughout the evaluation.

1.1 Policy context

Over the last decade, the European Commission has invested heavily in **eGovernment and interoperability** through several funding programmes, policies and political communications. The political commitment to successfully **bring Europe into the so-called 'digital age'** was already clear in 2010 in the Europe 2020 economic strategy which set out three interconnected and mutually reinforcing priority areas: Smart Growth, Sustainable Growth and Inclusive Growth. In this context, seven main flagship initiatives were launched, beginning in 2010 with the [Digital Agenda for Europe](#) as the first initiative contributing to the Smart Growth priority area, from which the ISA² programme and its predecessor, ISA, stemmed. In the same year, the Communication ['Towards interoperability for European public services'](#) led to the second version of the European Interoperability Framework (EIF), updating and integrating into the Digital Agenda the initial framework adopted in 2004.

In 2015, the DSM was launched under the Digital Agenda for Europe to ensure the access of businesses and citizens to online services under conditions of fair competition (pillar I), better conditions for digital networks and services to grow and thrive (pillar II), and the overall growth of the digital economy (pillar III). It is the third pillar of the DSM, the European Digital Economy, which is of particular relevance to the field of **eGovernment and interoperability**, since it called for an **enhanced EIF** for public services and proposed that the **new eGovernment action plan** include an initiative on the 'Once-Only' principle and an initiative on mandatory interconnection of business registers. In 2016, the new [eGovernment action plan](#) was adopted for the period from 2016 to 2020, contributing to increasing the efficiency, openness, user-friendliness and cross-border provision of digital public services across the EU. A [new EIF](#) was adopted in 2017 to respond to the evolving needs and technological developments. The EIF has provided guidance under the form of a non-binding approach rooted in principles, models and recommendations for developing digital and interoperable public services.

The [2017 DSM mid-term review](#) noted that good progress had been made in achieving the DSM in Europe. However, it pointed out that additional efforts needed to be made in the fields of data economy, cybersecurity and European public services to respond to the increasing demands of citizens and businesses.

The role of digitalisation and interoperability of public administrations and services was acknowledged beyond Commission initiatives. In a 2017 resolution, the European Parliament [affirmed](#) that the **digitisation of public administrations** shall aim to "promote better exercise of citizenship, improve the quality of life for citizens and the social and economic development of the regions, enhance citizens' understanding of and involvement in public services", while improving their efficiency and cost-effectiveness. Moreover, the resolution also emphasised that citizens should also benefit from **enhanced communication channels with public authorities and increased transparency**, which shall eventually contribute to increasing participation levels in the democratic process and in public policy development.

In a key step confirming the commitment of the Member States to interoperability, the [2017 Tallinn Declaration](#) reinforced the role of interoperability as a strategic component

for ensuring the effective delivery of public services in the Union. Furthermore, the Tallinn Declaration emphasised Member States' commitment to implementing the EIF, endorsed the re-use of open source software and open standards produced under the ISA² and CEF Programmes and encouraged the re-use of solutions developed under the programme. In this context of reaffirmed commitment to interoperability, further policy actions were taken. The **SDG Regulation** was adopted in 2018. The Regulation aims to facilitate the online access to information, administrative procedures and assistance services to citizens and businesses through a central point of access to public administration in the EU, fostering cross-border interoperability.

Acknowledging the crucial role of the digital transformation for the goals of the Union and for the EU's post-pandemic recovery, the Berlin Declaration on Digital Society and Value-Based Digital Government⁶ was adopted in December 2020. The Berlin Declaration shows the commitment of the Member States, alongside EU institutions, to tap the potential of digital public services and take a value-based approach to the digital transformation of the public sector. Importantly, such an approach needs to be built around key concepts such as digital sovereignty and interoperability, with a strengthened interoperability framework for the EU's public sector playing a central role. Looking towards the future, interoperability is set to continue to play a key role in the digital policy of the EU, as emphasised also by the Council in 2019 in its **conclusions** on the Future of a highly digitised Europe beyond 2020. The Von der Leyen Commission has ambitious goals for the Digital Agenda of the EU, as spelled out in a series of Communications published in 2020 and 2021:

- **Shaping Europe's digital future**, which lays out the vision of the Commission on harnessing the potential of the digital transformation for the EU and its citizens, underpinned by European values, for the next five years; one of the key actions in the Communication is the development of a **"reinforced EU governments interoperability strategy"** to foster coordination and the adoption of common standards for public services and data flows by 2021.
- A **European Strategy for Data**, which proposes nine European data spaces that rely on interoperability for seamless data exchanges to be possible.
- The **White Paper on AI**, which outlines actions on different levels to support the deployment of AI-based solutions in the EU, including the need to secure access to and the re-usability of data.
- A **New Industrial Strategy for Europe**, for innovation and a greener and more digital industry, for which it is essential to build EU leadership in key areas including data applications.
- The **SME Strategy for a sustainable and digital Europe**, which identifies, inter alia, the opportunities that digitalisation holds for SMEs in the EU; wider access to and the re-usability of data can support the development of innovative SMEs, another strong argument for the work on interoperability.
- The **Long-term action plan for better implementation and enforcement of Single Market rules**, focusing, inter alia, on better use of digital tools to improve access to information, fostering cooperation between Member States, and testing and applying advanced digital tools for public services.
- The **2030 Digital Compass: the European way for the Digital Decade**, laying out the goals of the Commission for the next decade of digital transformation, with key targets for the digitalisation of public services: "100% online provision of key public services available for European citizens and businesses", "100% of European citizens have access to medical records (e-records)", "80% of citizens will use a

⁶ Berlin Declaration on Digital Society and Value-Based Digital Government at the ministerial meeting during the German Presidency of the Council of the European Union on 8 December 2020

digital ID solution”⁷. To achieve these targets, the European Union and the Member States need to, inter alia, “ensure interoperability across all levels of government and across public services”⁸.

Against this background of ambitious initiatives and targets laid out for the next years, enhanced interoperability is expected to play a key enabling role. To date, no binding policy on public sector interoperability exists, however, guidance has been provided through the EIF and different legislative initiatives have taken shape over time in specific sectors or policy areas.

1.2 The ISA² Programme

While digitalisation holds great promise for the future of public services and the public sector, its potential cannot be tapped without a key enabler: interoperability. The European Commission has aimed to enhance the delivery of interoperable public services across different sectors through dedicated programmes. The ISA² programme (Interoperability solutions for public administration, businesses and citizens) has been the latest iteration in a series of programmes meant to support interoperability in the EU starting from the 1990s.

The programme for the **Interchange of data between administrations (IDA)** was effective from 1995 – 1999. **IDA** aimed to promote the development of the pan-European telematic networks for data exchange⁹. The successor of the first programme, **IDA II**, was effective from 1999-2004¹⁰, supporting the implementation of interoperable trans-European telematic networks to enable the exchange of information in an effective and secure manner. The programme for **interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens** (the ‘IDABC programme’)¹¹, rolled out between 2005 and 2009, more clearly emphasised the role interoperability plays in establishing pan-European eGovernment services for businesses and citizens. Following the success of the above-mentioned programmes on digitalising public services and interoperability of eGovernment, the European Commission developed **the interoperability solutions for European public administrations** (ISA programme)¹² in 2010 which was effective until 2015. In its resolution of 20 April 2012, “A competitive digital single market, eGovernment as a spearhead”, the European Parliament specifically recognised the contribution of the ISA programme and its overarching role in defining, promoting and supporting the implementation of interoperability solutions and frameworks for European public administrations, achieving synergies, promoting the re-use of solutions and translating their interoperability requirements into specifications and standards for digital services.

As the ISA programme’s successor, ISA² (Interoperability Solution for public administrations, businesses and citizens) was one of the main instruments supporting and promoting **public sector interoperability between 2016 and 2020**. ISA² is a spending programme of the European Union (EU) that supports the development of digital solutions that enable public administrations, businesses and citizens in Europe to benefit from **interoperable cross-border and cross-sector public services**. By identifying,

⁷ COM(2021) 118 final Communication from the Commission To The European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions “2030 Digital Compass: the European way for the Digital Decade”

⁸ Ibid., p. 11.

⁹ Council decision of 6 November 1995 on a Community contribution for telematic interchange of data between administrations in the Community (IDA) (95/468/EC)

¹⁰ Decision no 1719/1999/EC of The European Parliament and of the Council of 12 July 1999 on a series of guidelines, including the identification of projects of common interest, for transEuropean networks for the electronic interchange of data between administrations (IDA)

¹¹ ‘Decision 2004/387/EC of the European Parliament and of the council of 21 April 2004 ‘on interoperable delivery of pan-European eGovernment services to public administrations, businesses and citizens (IDABC)

¹² Decision no 922/2009/EC of the European Parliament and of the Council of 16 September 2009 on interoperability solutions for European public administrations (ISA) (Text with EEA relevance)

creating and facilitating the re-use of interoperability solutions, ISA² aims to promote a holistic approach to interoperability in the EU and thus – as a key enabler – it supports the implementation of various Union policies and activities. ISA² is also the principal instrument for implementing the [revised EIF](#) and its annex, the [Interoperability Action Plan \(IAP\)](#). The ISA² Programme had a budget of €131 million and ran for five years from 1 January 2016 until 31 December 2020. It was established by the ISA² Decision¹³.

The European Union has been supporting the digital transformation of the public administrations and interoperability through other relevant Commission-supported programmes such as:

- The **CEF** ('CEF programme')¹⁴, operating from 2014 to 2020, has been a key programme that supports the development of the infrastructures in the fields of transport, energy and digital services.
- The **Structural Reform Support Programme (SRSP)**, implemented from 2017 to 2020 (succeeded by the Technical Support Instrument (TSI) for the period 2021 to 2027)¹⁵, provided technical support to the Member States for designing and implementing reforms in various areas, including the modernisation of public administrations. Support continues in the next multi-annual financial framework through the TSI.
- The **Horizon 2020**¹⁶ programme, established for the period 2014-2020, provided support to research through grants offered in a number of areas including public sector digitalisation. It is now succeeded by the new Horizon Europe programme for 2021-2027.
- The **ERDF** ('ERDF programme')¹⁷, aims to support regional development and strengthen economic cohesion among regions in the EU. The funding available through the ERDF supports, inter alia, innovation and research as well as the digital transition.

Looking ahead, a new funding programme will play a crucial role in supporting digitalisation and interoperability, building on the achievements and lessons from the past years, including the experience of the ISA² programme. The 2021 – 2027 Multi-annual Financial Framework includes a new programme meant to bolster the digital agenda in the EU, namely the [Digital Europe Programme](#). With a planned budget of €7.5 billion (in current prices) from 2021 to 2027, this new financial instrument will support five key areas of the digital transition:

- **Supercomputing**, aiming to strengthen the EU's supercomputing and data-processing capacities and to increase the use of supercomputing in areas of public interest;
- **Artificial intelligence (AI)**, investing in AI applications for businesses and public administrations, fostering the creation of a European data space, and supporting AI testing and experimentation facilities;

¹³ Decision (EU) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA² programme) as a means for modernising the public sector, Brussels 4.12.2015.

¹⁴ Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010

¹⁵ Regulation (EU) No 2021/240 of the European Parliament and of the Council of 10 February 2021 establishing a Technical Support Instrument

¹⁶ Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC

¹⁷ Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006

- **Cybersecurity**, strengthening cybersecurity capacities and coordination across the EU.
- **Advanced digital skills**, supporting both specialised programmes designed to prepare future experts in the digital realm as well as upskilling programmes.
- **European Digital Innovation Hubs**, ensuring that European public administrations and industry alike take full advantage of the opportunities presented by digitalisation and new technologies.

Particularly within this last area, the Digital Europe Programme will ensure the **continuation of funding for actions to increase interoperability in the EU** with the goal of maximising the potential of digital technologies for the Single Market and for enhancing the provision of digital public services EU-wide.

In this context, the next years will be crucial in defining **the digital leadership of the EU**. Enhanced interoperability will be necessary to unlock the potential of data use and re-use for improved European public services, to enable cross-border collaboration, and to support the sector-specific policy goals set by the Commission for the next decade. The evaluation of the ISA² programme thus serves not only to provide an overview of the performance of the programme between 2016 and 2020 but also to inform future initiatives for public sector interoperability in the EU.

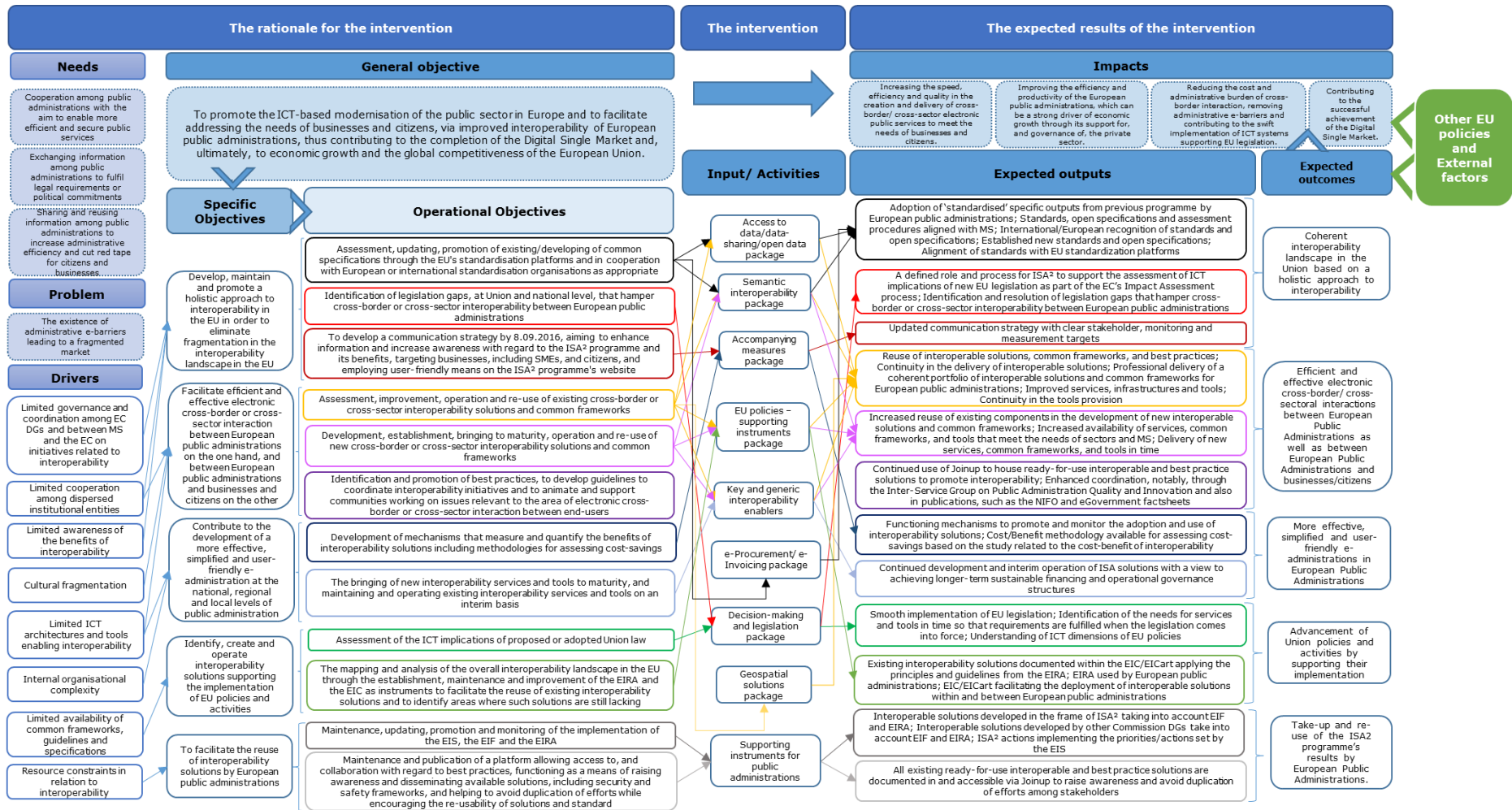
1.3 Intervention logic

The ISA² programme was based on a comprehensive framework of **needs and problems** to be addressed in the field of interoperability. The intervention was shaped by defining **general, specific and operational objectives** in addressing the main challenges in the field and by designing corresponding **activities** to reach these objectives– in this case, the activities are represented by the ISA² actions, grouped into nine packages. As the programme was set up, **expected results** (outputs, outcomes and impacts) were defined. These elements form the intervention logic of the programme, offering the full overview of the rationale behind the implementation of ISA² (see Figure 1).

The Final Evaluation of ISA² follows the same intervention logic discussed in the Interim Evaluation of the programme.¹⁸ This approach ensures full comparability between the findings of the Final Evaluation and the Interim Evaluation of ISA². In addition, this is the best approach from a methodological standpoint, as the intervention logic aims to clarify the logic followed by EU decision-makers back in 2015, when establishing the ISA² programme, and this ex-post perspective does not allow modifying the intervention logic used for the Interim Evaluation of ISA².

¹⁸ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

Figure 1 Intervention logic of the ISA² programme



Source: ISA² Interim Evaluation (CEPS, 2019).

2 State of play

Up to the end of 2020, the ISA² programme supported a total of 54 actions grouped in nine packages, which were defined on a yearly basis through an annual rolling work programme. The nine packages include the following:

- Key and generic interoperability enablers;
- Semantic interoperability¹⁹;
- Access to data / data sharing / open data;
- Geospatial solutions;
- eProcurement / eInvoicing;
- Decision-making and legislation;
- EU policies — supporting instruments;
- Supporting instruments for public administrations;
- Accompanying measures.

In its first year of operation, ISA² managed 39 actions, increasing to 43 actions in 2017, 53 actions in 2018, and 54 actions under both the 2019 and 2020 rolling work programmes. Table 1 and Table 2 provide a breakdown of the allocated budget and the number of actions per package and per year, respectively. While the interim evaluation covered the first three rolling work programmes, the final evaluation takes into account all rolling work programmes.

Table 1 Overview of allocated budget per package from 2016 to 2020 (in thousands of euros)

	2016	2017	2018	2019	2020	Total
1. Key and generic interoperability enablers	4,900	5,407	4,250	4,634	4,688	23,879
2. Semantic interoperability	2,008	1,831	1,503	1,989	1,928	9,259
3. Access to data/data sharing/open data	2,800	3,548	3,925	1,710	1,150	13,133
4. Geospatial solutions	983	2,240	1,900	2,200	2,300	9,623
5. e-Procurement/e-invoicing	2,400	1,445	1,063	807	1,000	6,715
6. Decision making and legislation	2,260	2,608	2,235	2,735	3,090	12,928
7. EU Policies - Supporting instruments	2,935	3,580	4,820	4,990	4,100	20,425
8. Supporting instruments for public administrations	4,425	3,533	5,315	6,030	7,585	26,888
9. Accompanying measures	1,280	730	1,290	1,370	1,530	6,200
Total	23,991	24,922	26,301	26,465	27,371	129,050

Note: This table presents the allocated budget per package as presented in the ISA² Rolling Work Programmes. The Rolling Work Programmes also list non-allocated budget, which includes reserves.

Source: ISA² Rolling Work Programmes (2016, 2017, 2018, 2019, 2020), Indicative Planning and Financial Overview.

¹⁹ In the 2016 and 2017 rolling work programmes, the semantic interoperability package is referred to as the "Information interoperability" package.

Table 2 Overview of the number of actions per package from 2016 to 2020

	2016	2017	2018	2019	2020
1. Key and generic interoperability enablers	6	6	7	7	7
2. Semantic interoperability	3	3	4	4	4
3. Access to data/data sharing/open data	5	5	7	7	7
4. Geospatial solutions	1	1	1	1	1
5. e-Procurement/e-invoicing	1	1	1	1	1
6. Decision making and legislation	6	9	10	10	10
7. EU Policies - Supporting instruments	3	3	5	5	5
8. Supporting instruments for public administrations	12	13	16	17	17
9. Accompanying measures	2	2	2	2	2
Total	39	43	53	54	54

Source: ISA² Rolling Work Programmes (2016, 2017, 2018, 2019, 2020).

The entire programme is coordinated by the **Interoperability Unit of DG DIGIT** (DIGIT.D2), while individual actions are implemented by different Commission services, depending on the thematic scope. The EU Member States were also involved in the programme governance through two channels: the **ISA² Committee**, the high-level governing body of the programme, and the **ISA² Coordination Group**, a technical body ensuring the horizontal coherence between the actions of the programme. Since the completion of the interim evaluation in 2019, which reported that three additional countries had joined the programme (Iceland, Montenegro and Norway) and that a cooperation agreement had been in place with Uruguay since March 2018, ISA² has gained an additional member – North Macedonia – since April 2020.

ISA² actions were selected and implemented through a process consisting of four steps performed each year:

1. **Submission:** Commission services, Member States, and other countries participating in ISA² were invited to submit proposals for actions to be included in the rolling work programme via a call for proposals.
2. **Evaluation:** The submitted proposals were analysed by DIGIT.D2, which compiled a list of proposals that qualified to be included in the rolling work programme, based on the selection and prioritisation criteria as defined in the ISA² Decision. At this stage, the ISA² Committee gave an opinion on the proposed action list.
3. **Adoption:** The rolling work programme was adopted by the Commission and the budget was released.
4. **Implementation:** The actions in the adopted rolling work programme were implemented by the Commission services in charge.

The progress with implementing the programme was monitored on a quarterly and annual basis through monitoring and evaluation reports, which fed into the [ISA² Dashboard](#). The Dashboard is an online interactive tool that facilitates the dissemination of information about the activities and achievements of actions with respect to efficiency, effectiveness

and coherence. The efficiency of actions is measured using the earned value management analysis (for further details, please see Chapter 6 Efficiency), effectiveness is presented in terms of performance indicators (for further details, please see Chapter 5 Effectiveness), and the coherence of actions is mapped using the number of links between the sampled actions and between the sampled actions and other EU programmes, policies, and initiatives (for further details, please see Chapter 7 Coherence).

3 Methodology of the evaluation

3.1 Overview of data sources

Throughout the Data Collection Phase supporting the final evaluation of the ISA² programme, a mix of data collection methods was employed to gather both primary and secondary data as follows (a schematic overview is provided in Annex G.13):

- **Primary data** were collected via the following consultation activities:
 - Targeted in-depth interviews;
 - Targeted online survey;
 - Public consultation;
 - Two workshops, which aimed to raise awareness of the ongoing evaluation and discuss preliminary findings with stakeholders.
- **Secondary data** were collected by reviewing:
 - Publicly available documents and data sources about the actions and solutions of the programme:
 - The ISA² website, with a particular focus on the ISA² Dashboard and the webpages dedicated to ISA² solutions and actions;
 - The Joinup platform, in particular the webpages dedicated to ISA² actions and solutions;
 - The ISA² Rolling Work Programmes;
 - Additional materials such as presentations, workshop summaries and brochures related to the ISA² actions and solutions;
 - Operational documents including monitoring and evaluation reports, reports on the perceived quality and utility of selected actions and solutions, information concerning the communication activities carried out in the context of the programme, and the participation in the ISA² Coordination Group and Committee meetings;
 - Studies and reports carried out as part of ISA² actions;
 - Relevant policy documents;
 - Relevant literature in the field of interoperability.

The above-mentioned sources were complemented by expert assessments conducted by the **five independent experts** who were part of the Study Team, in accordance with the Proposal²⁰. The independent experts were tasked to complete the questionnaire that serves as a basis for the in-depth interviews.

Sampling

To better guide the data collection activities, a sample of 21 ISA² actions was selected out of the total of 54 actions included in the 2020 Rolling Work Programme²¹ (see Annex G.1). To ensure comparability with the interim evaluation, the same sample of actions was used as for the interim evaluation²². One additional action was included in the sample in order to account for new developments in the programme, namely the new action that started after the interim evaluation of the programme was conducted (the action [Interoperability Academy](#)).

As explained in Box 1, the analysis of the sampled actions also contributed to the assessment of the achievements linked to the IAP.

²⁰ The Study Team includes five technical experts in the field of interoperability. Four of them have already performed an expert assessment of the ISA² programme, as they were part of the team working on the Interim Evaluation of the Programme.

²¹ The 2020 ISA² Rolling Work Programme is available on the ISA² website: https://ec.europa.eu/isa2/sites/isa/files/wp_2020_detailed_description_of_actions_part_1.pdf and https://ec.europa.eu/isa2/sites/isa/files/wp_2020_detailed_description_of_actions_part_2.pdf

²² CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²)

The desk research and review of the operational documents of the programme as well as the targeted in-depth interviews focused on the sampled actions. However, the targeted online survey was open to stakeholders related to all actions. The public consultation was also open to any interested stakeholders.

Box 1 ISA² contribution to the implementation of the IAP

The new EIF adopted in 2017 was accompanied by an IAP (annexed to the 2017 EIF Communication) listing key actions to be undertaken between 2017 and 2020. The EIF Communication acknowledged the ISA² programme as one of the main implementing instruments of the IAP and the EIF in general. Against this background, the evaluation of ISA² also considered how the programme contributed to the implementation of the IAP and thus to the implementation of the EIF in more broader terms. There is a clear direct relationship between several ISA² actions and the actions listed in the IAP, while other ISA² actions provide broader contributions across several areas of the IAP, as described in Annex G.8. Thus, the sample of ISA² actions contributes to assessing not only the performance of the programme across the evaluation criteria, but also to understanding how the programme has contributed to implementing the EIF through the IAP.

Primary data

The consultation activities started in December 2020 (with a kick-off workshop to raise awareness about the evaluation process) and lasted until the end of April 2021 (with the conclusion of the public consultation). The duration of each consultation activity was planned to ensure that stakeholders had enough time to provide their inputs (see Table 3).

Table 3 Timeframe and description of the consultation activities

Consultation activity	Timeframe
Online kick-off workshop: “How interoperability can achieve seamless data flows and services for the EU’s public sector”. The workshop aimed at raising awareness about the Evaluation of ISA ² , the Evaluation of the EIF and the Impact Assessment of for a Future Interoperability Strategy for the EU’s public sector and engaging stakeholders in the process.	3 December 2020
Targeted online survey: A targeted online survey was administered via EUSurvey and was conducted jointly with two other online surveys dedicated to the Evaluation of the EIF and the Impact Assessment of a Future Interoperability Policy for the EU’s public sector.	19 January 2021 – 7 March 2021 (the surveys remained open after the initial deadline set on 15 February 2021 to accommodate some last-minute requests from stakeholders)
In-depth interviews: Interviews were conducted with selected key stakeholders to collect detailed data and information contributing to the Evaluation of ISA ² . The interviews were complemented by expert assessments conducted by the five independent experts who were tasked with completing the questionnaire that served as the basis for the in-depth interviews.	1 February 2021 – 8 March 2021
Internet-based public consultation: This activity covered the Impact Assessment for a Future Interoperability Strategy for the EU’s public sector, with the option for stakeholders to contribute to the evaluations of the EIF and ISA ² as well. The questionnaire dedicated	1 February 2021 – 26 April 2021 (12 weeks)

to the ISA ² evaluation was available in English, German, and French, as was the case for the entire public consultation.	
Validation workshop: "What are the key achievements and lessons from ISA ² for the future of interoperability in the EU's public sector?". This workshop was organised as part of the DigitALL Public Conference marking the end of the ISA ² programme and CEF. The aim of the workshop was to discuss and validate the preliminary findings of the Final Evaluation of the ISA ² programme, collect further information and additional feedback on the different aspects of the programme, and engage stakeholders in the public consultation.	22 April 2021

Source: Authors' own elaboration

The three main consultation activities (i.e., the targeted online survey, the in-depth interviews and the public consultation) **engaged a total of 102 respondents**, which can be divided into seven stakeholder groups as presented in Table 4. The consultation activities reached out to different types of stakeholders, ranging from actors involved in the governance of the programme to indirect beneficiaries of the ISA² programme (i.e., citizens and businesses). Primary data provided inputs for the assessment of all evaluation criteria set out in this Evaluation. In particular, the in-depth interviews as well as the targeted online surveys, which were tailored to targeted stakeholders, allowed for the collection of in-depth information for the evaluation process. The feedback to the consultation activities is analysed according to the roles of stakeholders in the ISA² programme which include:

- Experts and academia (including the independent expert assessments and feedback from two stakeholders from the group of standardisation organisations);
- ISA² action owners (Commission representatives in charge of specific actions defined under ISA²);
- ISA² solution users (both at EU and national level);
- National and sub-national interoperability actors (national and sub-national public authorities with good knowledge of the programme);
- Programme governance (Commission and Member States representatives who are directly involved in the governance of the EIF and ISA²);
- Stakeholders involved in the implementation of linked EU policies (Commission representatives who are responsible for expert groups linked to ISA²/EIF or are in charge of EU initiatives potentially linked to ISA²/EIF);
- Wider public (including citizens, businesses, NGOs, and respondents from public authorities with a more limited knowledge of the ISA² programme).²³

Table 4 Overview of respondents engaged by the consultation activities by stakeholder group

Stakeholders \ Consultation	In-depth interview	Online survey	Public consultation	TOTAL
Experts and academia	5*	8	-	13
ISA ² action owners	3	12	-	15
ISA ² solution users	1	4	-	5

²³ Apart from the wider public, the stakeholder groups listed were specifically targeted through interviews and online survey. The wider public category encapsulates the input coming from the respondents to the public consultation. Two caveats apply in this regard: considering that there were five national and sub-national public authorities with very good knowledge of the programme, this feedback was taken into account as part of the group "national and sub-national public authorities". Furthermore, two respondents to the public consultation from EU institutions also indicated a great extent of familiarity with the programme. Hence their answers were considered in the category "stakeholders responsible for linked policies".

Stakeholders \ Consultation	In-depth interview	Online survey	Public consultation	TOTAL
National/sub-national public authorities	-	10	5	15
Programme governance	2**	7		9
Stakeholders involved in the implementation of linked EU policies/initiatives	3	4	2	9
Wider public	- (invited to participate in the public consultation only)	- (invited to participate in the public consultation only)	36	36
TOTAL	14	45	43	102

*The five in-depth interviews conducted with the group of experts and academia correspond to the five expert assessments.

**One follow-up interview to the targeted online survey was conducted.

Source: Authors' elaboration based on the answers received to the consultation activities

In order to facilitate the comparison of stakeholders' responses, the questionnaire of each consultation activity relied on Likert scales. Respondents were thus asked to provide their feedback by referring to a scale from (1) to (5) or (1) to (4), depending on the type of question²⁴:

- 1 – not at all; 2 – to a limited extent; 3 – to some extent; 4 – to a great extent; or 5 – completely;
- 1 – definitely would not; 2 – probably would not; 3 – probably would; 4 – definitely would.

Against this background, this Study presents the aggregate results of the consultation activities using bar charts showing the average scores of responses from each stakeholder group. The average scores do not account for "don't know/no opinion" answers. The data labels of the bar charts display the average score first, then the corresponding number of respondents in brackets.

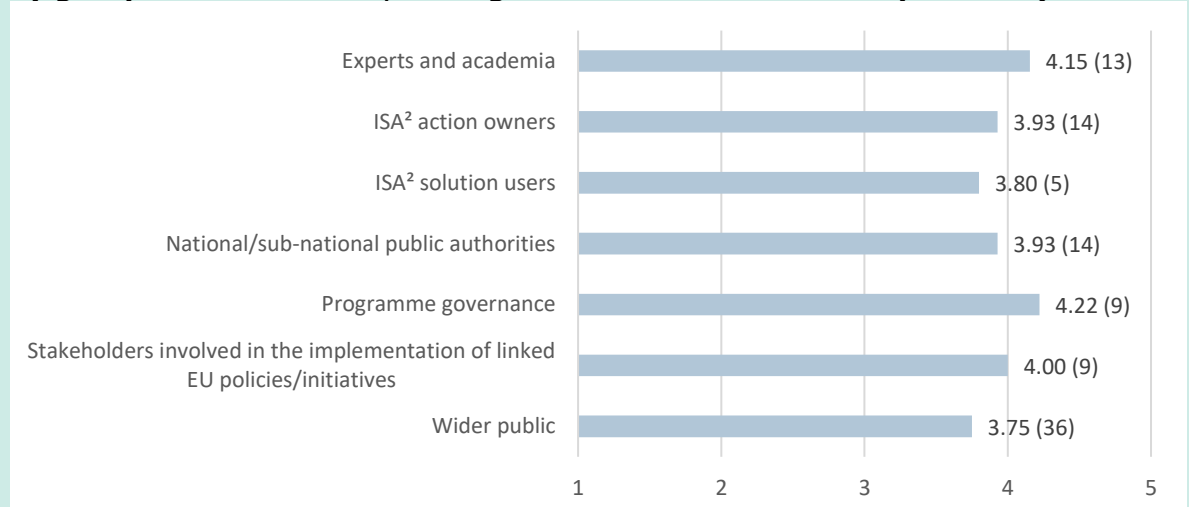
Finally, Box 2 provides a snapshot of the level of knowledge in the field of digital public services as well as the knowledge of the ISA² programme of participants in the consultation activities. Overall, the respondents exhibit a high level of knowledge, reinforcing the quality and the reliability of primary data.

Box 2 Overview of the level of knowledge of respondents

The majority of respondents have a very good level of knowledge in the field of digital public services and interoperability (with an average score of 3.9 out of 5 based on the answers received to both the targeted and public consultations). Comparatively, ISA² solution users and the wider public have a slightly lower level of knowledge of the field, while experts and academia have the greatest level of knowledge among the stakeholder groups (see Figure 2).

²⁴ For each question, the respondent had also the possibility to select the answer "don't know/no opinion".

Figure 2 Knowledge of digital public services and interoperability (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 100.

Similarly, the majority of respondents are generally familiar to some extent or to a great extent with the ISA² programme (average score of 3.5 out of 5 based on the answers received to both the targeted and the public consultations), with the wider public scoring lowest among the stakeholders (see Figure 3).

Figure 3 Knowledge of ISA² (breakdown by group of stakeholders; average score and number of respondents)

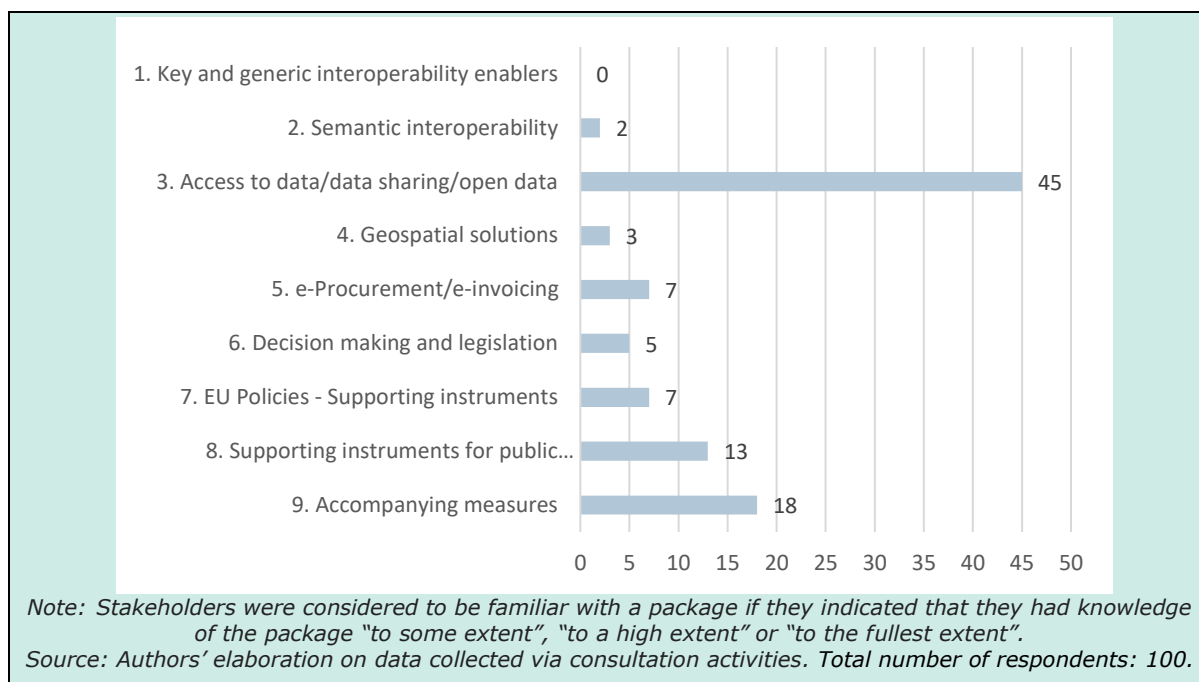


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 102.

Finally, almost half of the total respondents (45) are familiar with at least three packages of ISA² (see Figure 4). Considering the breadth of actions and the variety of stakeholders of the programme, it is natural that some of the consulted stakeholders may be less familiar with some areas of the programme and more familiar with those with which they have interacted more closely.

Figure 4 Knowledge of ISA² action packages (number of respondents familiar with a given number of packages)



Secondary data

This Evaluation Study relies on an extensive review of available secondary data.

Publicly available documents and data about the implementation of ISA² actions and solutions make up one of the main categories of secondary data analysed throughout this Evaluation Study.

One of the main sources of data was the ISA² website, which provides a comprehensive overview of the actions and solutions supported by the programme. The **ISA² Dashboard** provides information across a range of criteria. It details the budget allocated to the ISA² actions and the costs as well as earned value management data, used to keep track of the progress in implementing the programme. Such data feed into the analysis of the efficiency of the programme. In addition, the Dashboard features an overview of the existing links between ISA² actions and links between actions and other EU programmes, policies and initiatives, which contributes to the analysis of the coherence of the programme. Besides the Dashboard, the ISA² website features **dedicated webpages for the ISA² solutions and actions**, containing information about the outputs of the programme and related performance indicators. These webpages are complemented by the information made available on the **Joinup** platform on the actions and solutions developed under ISA². The data available contribute primarily to the assessment of the effectiveness, efficiency, EU added value, and utility of the programme. Finally, the **ISA² rolling work programme**, published annually during the implementation of the programme, provided further details on the ISA² actions, allowing the Study Team to gain a comprehensive understanding of the coherence and sustainability of the programme and the way the actions have contributed to the principles spelled out in Article 4 of the ISA² Decision.²⁵ Additional materials such as presentations, workshop summaries and brochures related to the ISA² actions and solutions were also used to complete the overview of the outputs of the programme.

Further **operational documents** were shared with the Study Team by DIGIT.D2. First, the Monitoring and Evaluation reports prepared as part of the regular monitoring of the

²⁵ The assessment of how the programme contributed to the principles listed under Art. 4(b) of the ISA² Decision is an obligation included in the ISA² Decision, in Article 13 (5).

programme were made available, completing the information and data provided through the ISA² Dashboard for assessing the programme's effectiveness and efficiency. In addition, the Study Team also reviewed three reports on the perceived quality and utility of selected actions and solutions that were published in the first half of 2021 and contributed to the evaluation of the utility of the programme. Data on communication activities were also reviewed, including details on the events organised as part of the ISA² programme throughout its existence and events in which the programme was represented, in order to gain a comprehensive understanding of the awareness-raising activities implemented. Finally, the information on participation in the ISA² Coordination Group and Committee meetings was also considered in the assessment of the EU added value of the programme.

Studies and reports carried out as part of ISA² actions were considered throughout the evaluation, contributing additional evidence and examples of the programme's implementation. **Relevant policy documents** were reviewed to develop a comprehensive overview of the policy context and to assess the programme's coherence and EU added value in particular. Finally, the **relevant literature** in the field of interoperability was reviewed throughout the evaluation, with key findings feeding primarily into the assessment of the relevance of the programme.

3.2 Data validation

The collected data were **validated via triangulation** to ensure the robustness of evidence. Prior to analysis of all evaluation criteria and questions, relevant data and information were **collected from multiple sources and using different methods**, in order to ensure that all the findings of the Evaluation Study are based on well-grounded evidence. This approach allows for increasing confidence in collected data, comparing and contrasting findings, and providing a clearer understanding of the issues at stake. Tool #4 of the Better Regulation Toolbox on evidence-based better regulation defines triangulation as "the application and combination of several research methodologies in the study of the same phenomenon"²⁶. Validity requires checking "whether the findings of a study are true and certain: "true" in the sense that research findings accurately reflect the situation; and "certain" in the sense that research findings are supported by evidence"²⁷. In this respect, the Study Team relied on three different types of triangulation to provide a solid basis for drawing robust conclusions:

- **Triangulation of data.** For each evaluation question, data are collected from multiple sources and stakeholders.
- **Triangulation of methods.** For each evaluation question, data are collected via at least two different data collection methods (e.g., interview, targeted questionnaire, public consultation, desk research).
- **Triangulation of evaluators.** Several members of the Core Study Team and Support Team are involved in data collection activities; in addition, each evaluation question is addressed by at least two members of the Core Team. Hence, conclusions must be agreed upon by at least two evaluators.

3.3 Quantitative methods for data analysis

As this Study relies on evidence of both quantitative and qualitative nature, a range of methods and tools were employed for data analysis. Descriptive statistics have been used to analyse the results of the consultation activities (as outlined in section 3.1 concerning primary data) together with a qualitative analysis of the open responses of the consulted stakeholders. The qualitative information gathered (as outlined in section 3.1 concerning

²⁶ European Commission (2017), Tool #4 Evidence-based better regulation in the Better Regulation Toolbox, available at https://ec.europa.eu/info/files/better-regulation-toolbox-4_en. Last accessed: 7 June 2021.

²⁷ Triangulation: Establishing the Validity of Qualitative Studies, Lisa A. Guion, David C. Diehl, and Debra McDonald, 2011.

secondary data) was aggregated compared and summarised to support the analysis of the evaluation criteria. Together with these methods, the Study Team has applied three specific quantitative methods in order to evaluate the efficiency of the programme:

- The **standard cost model** (SCM)²⁸ is a method for assessing administrative costs imposed by rules or policies inter alia on businesses and public administrations. It is based on the identification of the basic components of a rule, the information obligations, whose costs for the addressees can be measured and quantified. An information obligation is a specific duty to gather, process or submit information to the public authority or a third party. The SCM was used to measure the costs borne in terms of days spent by action owners to prepare and submit proposals for ISA² actions.
- The **cost-effectiveness analysis** (CEA)²⁹ is a method for assessing the merits of a policy in an interim and ex post evaluation setting. In a nutshell, CEA measures the value-for-money of past policies, i.e. the amount of benefit generated by unitary costs. Costs are measured in monetary terms, whereas effectiveness is measured in "natural units", and the unit of account varies depending on the nature of the problem addressed (e.g., number of users of Key and Generic Interoperability Enablers). The heterogeneity of performance indicators available for ISA² actions makes it difficult to draw conclusions about the overall cost-effectiveness of the programme and thus allowed using CEA only for certain action packages and indicators, as described in Chapter 6 of this report.
- In line with the PM2 methodology developed by the Commission³⁰, the **earned value management** (EVM) and **earned schedule** (ES) methods are currently used to monitor and assess the efficiency of the ISA² programme. EVM is a project management technique that helps determine work progress against a given baseline, so that costs, time, and scope of a certain activity are constantly tracked. In the context of the ISA² programme, efficiency is assessed at action and programme levels. The implementation of EVM requires managers to calculate the earned value, i.e. a quantification of the 'worth' of the work done to date, and the actual costs, i.e. the executed budget for achieving the work, and to compare them with the planned value of such activity. This allows for a better understanding of the performance of the programme. The ES is an extension of the EVM method that deepens the level of analysis to a 'unit of time' layer. In the framework of the ISA² programme, tailored versions of the EVM and ES approaches are adopted³¹. The Study Team relied on secondary data to apply this method and show the progress made with implementing the programme.

3.4 Main limitations

The availability of a mix of primary and secondary data, gained through the consultation activities and the full implementation of the data collection plan put forward in the Evaluation Framework (see Annex D) allowed the Study Team to draw robust conclusions for each evaluation question. However, it is necessary to point out that existing caveats

²⁸ European Commission (2017), "Tool #60. The standard cost model for estimating administrative costs", in the Better Regulation Toolbox, available at https://ec.europa.eu/info/sites/info/files/better-regulation-toolbox_2.pdf. Last accessed: 7 June 2021. SCM Network (2005), "The International SCM Manual; Measuring and Reducing Administrative Burdens for Businesses", available at:

http://www.administrativeburdens.com/filesystem/2005/11/international_scm_manual_final_178.doc

²⁹ European Commission (2017), "Tool #57. Analytical methods to compare options or assess performance", in the Better Regulation Toolbox, available at https://ec.europa.eu/info/sites/info/files/better-regulation-toolbox_57.pdf. Last accessed: 7 June 2021.

³⁰ European Commission (2018), PM² project management methodology, available at: <https://publications.europa.eu/en/publication-detail/-/publication/ac3e118a-cb6e-11e8-9424-01aa75ed71a1/language-en/format-PDF/source-83307127>

³¹ More specifically, the tailored version is based on the Earned Value Management Tutorial, Module 1: Introduction to Earned Value Management, prepared by Booz, Allen and Hamilton, Department of Energy, the United States of America, and on the guidelines on Earned Schedule in Action, developed by Kim Henderson, from the Project Management Institute (PMI) Oklahoma, 13.07.2007.

may have affected the main findings. Compared to the interim evaluation of the ISA² programme, while the constraint of having only a very short timeframe for the evaluation of some actions has been overcome for the most part, other limitations have remained or have emerged.

One constraint consisted in the lack of direct contact with solution users. The **contact details for solution users** were not shared with the Study Team in order to preserve confidentiality and respect the data protection regulation. In this respect, the Study Team followed a two-step approach. As for the interim evaluation, action owners were requested to: i) invite solution users to participate in the consultation activities; and ii) share the contact details of solution users who gave their consent with the Study Team. To facilitate action owner engagement in this process, the Study Team drafted e-mail requests that could be forwarded to action owners. However, this indirect approach with intermediate steps may have limited the number of answers received from solution users.

Another limitation may be the potential '**consultation fatigue**' of respondents and complexity of consultations. With the programme having come to an end, stakeholders may have been confronted with multiple requests for feedback (for instance, feedback on the overall evaluation of ISA², feedback on specific ISA² actions as part of the continual monitoring and evaluation of the programme, feedback feeding into the design of a future interoperability policy for the EU's public sector). Given the technical nature of the field of interoperability, the fact that several consultations with various degrees of complexity occurred at similar times might have resulted in some stakeholders being more selective about the consultations they wished to engage in.

Compared to the interim evaluation, however, a higher number of respondents contributed to the public consultation (43 respondents in the final evaluation and 14 respondents in the interim evaluation). This result may be due to the fact that the consultation activities were run jointly with the consultations contributing to the evaluation of the EIF and the impact assessment for a future interoperability policy for the EU's policy. The joint consultations may have attracted more respondents to the ISA² consultation. This outcome, in turn, counterbalances the low rate of responses from solution users (5 respondents in the final evaluation compared to 43 solution users in the interim evaluation).

4 Relevance

Key findings

Evaluation question 1: To what extent are the objectives of the ISA² programme still pertinent in relation to the evolving needs and problems at both national and EU levels?

- The **main needs** addressed by the programme **remain highly relevant**: the need for cooperation among public administrations for more efficient and secure public services, the need to exchange information between public administrations to fulfil legal requirements, the need to share and re-use information to improve administrative efficiency. In addition, administrative e-barriers are still posing issues and leading to fragmentation. While some of the original needs and problems are still not entirely resolved, new priorities and issues emerged. The objectives of the ISA² programme are still relevant but do not entirely cover the emerging challenges.
- The **COVID-19 pandemic** has had an important impact on the relevance of the programme and of interoperability initiatives more generally. The pandemic has exacerbated existing needs, including the need for coordination when implementing digital solutions. In this context, the ISA² programme reacted by facilitating the exchange of best practices and the re-use of solutions through a common repository, the “Digital Response to COVID-19” collection on Joinup.
- Beyond the pandemic, the relevance of interoperability has been clearly reiterated through the **December 2020 Berlin Declaration**, which shows the commitment of Member States to enhancing interoperability and supporting digital sovereignty. What is evident is that the achievements of ISA², having an operational focus, need to be complemented with a more consistent governance of interoperability in the EU.
- Several additional needs were emphasised during the consultation activities (but ISA² could only play a partial role in addressing these needs, as they go beyond the scope of what the programme was meant to achieve):
 - The need for **digital literacy and skills**;
 - The need to **exchange best practices** between Member States and public administrations in a structured and proactive way;
 - The need to ensure a **feedback loop with citizens** in order to improve the functioning of digital tools and solutions.
- Looking towards the future, the wider framework of tools and policies needs to be taken into account to effectively address the existing challenges. The following measures could be taken to ensure that a future initiative carrying forward the achievements of ISA² remains fully relevant:
 - **Building a holistic, multi-dimensional approach to interoperability** as part of the Digital Europe Programme to respond to challenges that cut across multiple domains.
 - **Supporting collaboration and exchanges of best practices** between Member States in a structured and proactive manner, engaging especially regional and local administrations.
 - **Ensuring a feedback loop with the users of digital tools** in order to improve the functioning of digital tools and solutions;
 - **Developing an enhanced governance of interoperability in the EU** that, among others, would allow for the benefits stemming from the ISA² programme, at the more operational level, to be fully realised. The planned “reinforced EU governments interoperability strategy” should thus provide a more binding framework for interoperability, building on the commitment of the Member States to this issue.
 - **Ensuring the take up of digital tools and solutions at regional and local levels** with the support of Member States.

4.1 Introduction

As digitalisation and emerging technologies bring **new opportunities for the development of public services**, it is essential to understand whether the objectives of ISA², five years after the programme was put in place, are still responding to the evolving needs and problems experienced by stakeholders. Moreover, the turn of the decade marked by the **COVID-19 pandemic** shed a more prominent light on the role of digitalisation in the public sector. The pandemic brought forward the urgent need for cross-country cooperation through specific digital solutions that require a solid interoperability foundation in order to work as desired. In this context, this chapter outlines the specific needs and problems that ISA² has been seeking to address, taking into account both existing and new challenges in the field of interoperability. The evidence presented feeds into the following **evaluation question**:

- To what extent are the objectives of the ISA² programme still pertinent in relation to the evolving needs and problems at both national and EU levels?

The analysis focuses on two main **judgment criteria** (see Annex F):

- Alignment between needs and problems originally addressed by the programme and stakeholders' perception of needs and problems, i.e., the evolution of the needs and problems;
- Alignment between stakeholders' perception of needs and problems at the EU, national and sub-national levels and the objectives of the programme.

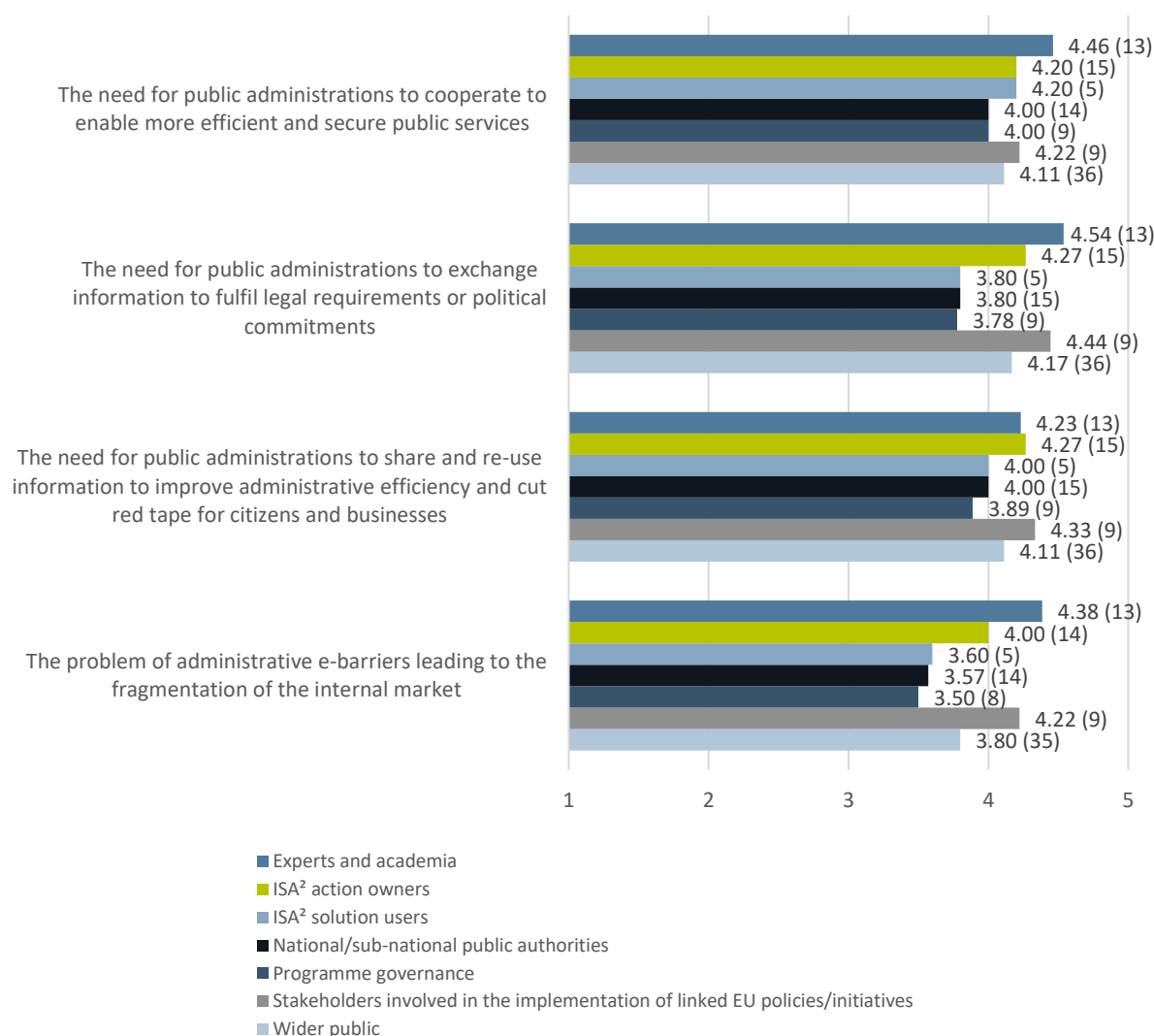
4.2 Analysis

Evolution of the needs and problems

The digital transformation of the public sector brings with it not only benefits, but also challenges. Programmes such as ISA² need to take stock of the problems and needs experienced by stakeholders to ensure that the measures and activities implemented (in this case, the interoperability solutions and supporting activities of ISA²) keep up with the evolving challenges.

In this regard, Figure 5 shows the extent to which the needs and problems that ISA² set out to address are still experienced by consulted stakeholders. The feedback confirms that **such needs and problems are still an issue for interoperability in the EU's public sector** (see Figure 5). Almost all respondents across the stakeholder groups indicated that the needs originally addressed by ISA² are still present to a great extent or completely (based on average scores of 4.2 out of 5 for the need for the need for public administrations to cooperate to enable more secure and efficient public services, and 4.1 out of 5 for the other two needs). In addition, the problem of administrative e-barriers leading to the fragmentation of the internal market is also considered highly relevant (based on an average score of 3.9 out of 5).

Figure 5 Extent to which needs and problems originally addressed by ISA² are currently experienced by European public administrations, businesses and/or citizens (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents for each need and problem from top to bottom: 101, 102, 102, 98.

Recent academic sources and reports further substantiate the existing needs and problems in the field of interoperability that ISA² sought to address over the course of its existence³². The need for coordination and cooperation, *inter alia*, is considered as an important requirement for efficient and secure public services. A 2013 study on the need for the cross-border digital public services emphasised that **limited cooperation** among the public administrations is the most crucial barrier for improving the delivery digital public services (Tinholt et al., 2013). The importance of the **cooperation and governance of interoperability initiatives among Member States** is reiterated as a key element by De Abreu (2017). The paper acknowledged that cooperation among Member States improves the efficiency of public services, contributing to cost savings. Similarly, but focusing on a specific sector, Kourabali and Katehakis (2019) concluded that

³² The full overview of relevant literature is presented in Annex G.10.

there is a need for better cooperation among public administrations to improve the sharing and re-use of data in the healthcare domain and thus enhance the provision of healthcare services. A focus on increased cooperation and enhanced governance of interoperability thus appears to be essential, based on key findings from consulted stakeholders and relevant literature in the field of interoperability.

The limited sharing of information and re-use of data is another recurring problem. The research by Kalvet et. al. (2018) on the once-only principle shed more light on the main barriers to the development of cross-border services. The barriers include existing heterogeneity of technological infrastructures, the limited legal interoperability and low awareness of the benefits stemming from the implementation of the once-only principle. An additional challenge, as reported by Krimmer et. al. (2018), is the relatively more limited willingness of public administrations to undertake major organisational and technological changes to enable the implementation of the once-only principle at the cross-border level compared to implementing the once-only principle at the national level.

Based on the findings from the consultation activities and further substantiated through the review of relevant literature, there are **additional needs and problems** in the field of interoperability, including:

- Needs deriving from or exacerbated by the **COVID-19 pandemic**, including the need for coordination when implementing digital solutions, the need for interoperability in particular fields such as healthcare and mobility and the need to create joint solutions to support contact-tracing efforts and the vaccination campaigns (e.g., vaccine certification schemes.);
- The need for **digital literacy and skills** to ensure that the tools developed can also be used effectively and thus improve take-up;
- Extended diffusion of **digital identity**;
- The need to **exchange best practices** between Member States and public administrations at all levels in a structured and proactive way;
- The need to ensure a **feedback loop with citizens** in order to improve the functioning of digital tools and solutions;
- The need for **consistent governance** of the different initiatives in the field of interoperability at the EU level.

Looking at **the takeaways from the Interim Evaluation** of the programme³³, it is clear that some of the above-mentioned needs have been persistent:

- In terms of governance of interoperability, the Interim Evaluation noted the need for a more binding legal framework for interoperability and for a more prescriptive approach to the design of interoperable public services;
- In terms of cooperation, the need to exchange best practices was also noted in the Interim Evaluation, together with the need to improve the communication between administrations in view of the diverse landscape of organisations and functioning of administrations in the Member States.
- The need for skilled staffed was also echoed in the Interim Evaluation, in particular the shortage of qualified IT staff in the national and subnational public administrations.

The additional needs and problems are **further substantiated by existing studies and reports**³⁴. For interoperability to work, digital skills play a crucial role. The 2020 report by Misuraca et. al. ("Exploring Digital Transformation in the EU") acknowledged the urgent need for public servants with **relevant skills** as one of the main challenges that the EU is currently facing, and new roles and career paths should be designed to attract highly skilled professionals. An exercise in estimating the size of this problem reveals a **shortage**

³³ CEPS (2019), Study supporting the Interim Evaluation of the ISA² programme.

³⁴ The full overview of relevant literature is presented in Annex G.10.

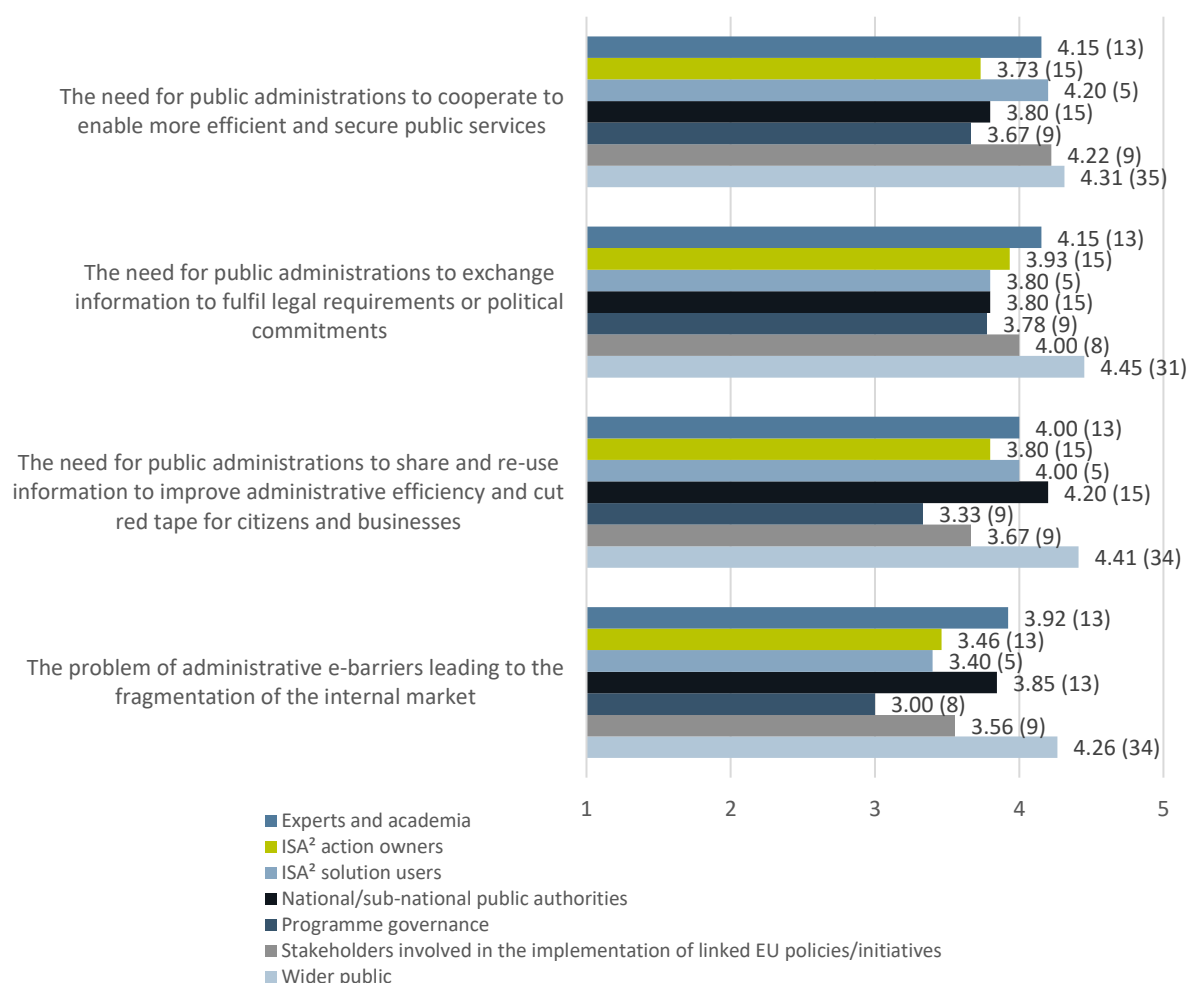
of key digital and technological skills in the public sector that are essential for the successful and timely implementation of the EU's initiatives supporting the digital government transformation (Chin et. al., 2020). Estimates show that the EU public sector faces a shortage of 8.6 million workers with relevant skills in three areas: technological skills (for instance, data analysis), digital citizenship skills (for example, digital literacy), and classical skills (including, based on the methodology of the study, skills such problem solving). In particular, it is estimated that up to 1.7 million workers with technological skills and nearly 3.2 million workers with digital citizenship skills will be needed in the EU's public sector by 2023 in order to effectively support the digital transition agenda of the EU.

Alignment between needs and problems (current and evolving) and the objectives of the programme

The analysis in the previous section shows that the needs and problems that ISA² set out to address are still relevant. This section analyses the extent to which the objectives of the programme are still fit to respond to the original needs and problems as well as to any additional challenges that have emerged during the existence of the programme.

While the needs and problems are still experienced in the field, **achieving the objectives of the ISA² programme can contribute to addressing them** (see Figure 6). On average, consulted stakeholders confirm that the programme is contributing to a great extent to addressing public administrations' needs to cooperate and enable more efficient and secure public service, to exchange information in order to fulfil legal requirements or political commitments, as well as to share and re-use information to improve administrative efficiency and cut red tape. It is particularly interesting to note that respondents among experts and academia, as well as the wider public tend to have a more positive view of the programme compared to the other stakeholder groups. By contrast, programme governance stakeholders point to a more limited alignment. With an overarching perspective of the programme, this stakeholder group emphasised in particular the fact that the needs cannot be tackled only through ISA² and thus other initiatives are important in the field to fully address the needs and problems.

Figure 6 Extent to which achieving ISA² objectives contribute to addressing the needs and problems originally addressed by the programme (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents for each need and problem from top to bottom: 101, 96, 100, 95.

In addition, 38 respondents (out of the 59 stakeholders who participated in the targeted consultations) indicated that there are other needs and problems related to the interoperability of public services, keeping in mind that the needs and problems targeted by the ISA² programme are already quite comprehensive.

The additional needs and problems mentioned by stakeholders are cross-cutting, cross-border and cross-sectoral, and they are experienced by public administrations at all levels. A majority of the 38 respondents who indicated that there were additional needs also emphasised that achieving the ISA² objectives can contribute to addressing these needs at least to some extent. Nevertheless, these needs and problems go beyond the scope of what the ISA² programme is meant to achieve. The wider framework of tools and policies needs to be taken into account to effectively address the challenges experienced by stakeholders.

Figure 7 Extent to which achieving the ISA² objectives contributes to addressing additional (current) needs and problems identified by consulted stakeholders (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 38.

Box 3 The COVID-19 pandemic and the role of digitalisation in the public sector

To gain a comprehensive understanding of the relevance of the ISA² programme and the ongoing work on interoperability, it is crucial to examine the situation that has emerged during the **COVID-19 pandemic**. Newly published studies show how interoperability or lack thereof has played a role in the management of the crisis. The COVID-19 pandemic accelerated the need to switch from the in-person provision of public services to more digitalised solutions. Emerging research shows that Member States with **higher levels of digitalisation and interoperability** in the public sector faced **fewer challenges** and reported less disruptions in the provision of public services during the pandemic ([Charay et. al., 2021](#)). In addition, principles such **re-usability and once-only** have played an important part as well. One example is seen in the case of Croatia, where public authorities introduced digital solutions as tools for managing the pandemic (e.g., an ePass to certify valid exemptions from the strict lockdown rules), building on existing ICT (Information Communication Technology) solutions and using data effectively based on interconnections between registries which were enabled through the implementation of the once-only principle ([Charay et.al., 2021](#)). From the experience in the early stages of the pandemic, **the urgent need for better governance and better coordination of measures at the EU level** became clear. For this to be possible, the exchange of information and quality data between public administrations has played a crucial role and shortcomings in this area had a negative impact on the ability of the EU to react jointly to the pandemic (Renda and Castro 2020). The need for coordination became evident in the development of solutions to manage the pandemic, such as the COVID-19 tracking apps and vaccination passports. Ciucci and Gouardères (2020) discuss the different approaches taken by Member States to design and implement contact tracing apps, noting that the diversity in approaches has had a negative impact on the cross-border functions of the app, which proved that **interoperability by design** is necessary (Ciucci and Gouardères, 2020). Besides the COVID-19 tracing apps, signs of divergent approaches among several Member States could also be seen with regard to the digital certificates for vaccination, testing and recovery in the first part of 2021 (Mithani et. al., 2021). A common solution has nevertheless been seen as critical in enabling a better

management of the pandemic as the EU entered its second year of the COVID-19 public health crisis (Gstrein et. al., 2021), paving the way to the Commission proposal for a Regulation to introduce “Digital Green Certificates” as a common digitally-enabled EU solution.

The last year of the functioning of the ISA² programme was also marked by the COVID-19 pandemic. In response to some of the disruptions experienced as a result of the pandemic, and to facilitate cooperation, the exchange of best practices and solution re-use, the [“Digital Response to COVID-19” collection](#) was set up on the Joinup platform as part of the ISA² programme. This collection has brought together a variety of resources including tools and data (such as open source software, open data, websites, platforms and events) to support public administrations, citizens and businesses in managing the pandemic. There is a key finding from the pandemic experience: ongoing work on interoperability can help build resilience in systems and equip the public sector to respond more effectively to the general needs of citizens, businesses and public administrations, but it can also become a key component in times of an unexpected crisis. In this context, ISA² has supported and promoted the importance of enhancing the interoperability landscape in the EU, supporting the continuing work on improving the provision of digital and interoperable public services.

Beyond the pandemic experience, several **recent developments** have reinforced the relevance of the programme and have also responded to **recommendations formulated as part of the Interim Evaluation** of the programme³⁵. In particular, with respect to the relevance of the programme the Interim Evaluation recommended:

- “Ascertaining that interoperability of digital public services becomes a priority for EU Member States.” The adoption of the [Berlin Declaration](#) in December 2020 clearly states the commitment of Member States to interoperability, which is seen as essential for the EU to be able “to develop and deploy our own key digital capacities” thus contributing to digital sovereignty. With ISA² having come to an end, it is essential that future initiatives, in particular those undertaken as part of the Digital Europe Programme, but not only, provide timely actions to support this commitment.
- “Performing more studies to assess the opportunities or challenges brought by new ICT developments with regard to interoperability.” An overview of the studies published as part of the ISA² programme shows that recent work takes an active look at key ICT developments and what these could mean for interoperability in the public sector. Examples include:
 - “Exploring Digital Government Transformation: understanding public sector innovation in a data-driven society” (2020);
 - “Artificial Intelligence in the public sector. Use, impact and governance of AI in the public sector of the EU” (2020);
 - “Blockchain for Digital Government” Final Report (2019);
 - “Architecture for public service chatbots” (2019).

Several areas for improvement that were pointed out in the Interim Evaluation still remain. In light of the insights presented throughout this Chapter, and building on the findings from the Interim Evaluation, the following measures could be taken to ensure that a future initiative carrying forward the achievements of ISA² remains fully relevant:

- **Supporting collaboration and exchanges of best practices** between Member States in a structured and proactive manner. A special emphasis is put on engaging

³⁵ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

regional and local administrations, where more awareness of interoperability and take-up of interoperable solutions is deemed to be important.

- **Ensuring a feedback loop with the users of digital tools** in order to improve the functioning of digital tools and solutions;
- **Developing an enhanced governance of interoperability in the EU** that, among others, would allow for the benefits stemming from the ISA² programme to be fully realised at the more operational level. The planned “reinforced EU governments interoperability strategy” should thus provide a more binding framework for interoperability, building on the commitment of the Member States to this issue. This is an opportunity to reinforce the need for re-use of common interoperability solutions and ensure that stakeholders at both the EU and Member State levels cooperate effectively against the background of a common framework of principles and guidelines actively enforced throughout the EU.
- **Building a holistic, multi-dimensional approach to interoperability** to respond to challenges that cut across multiple domains which should include enhanced governance, increased exchange of best practices, and a focus on nurturing digital skills for the digital transition in the public sector. In this, the Digital Europe Programme will play a central role over the next years.

5 Effectiveness

Key findings

Evaluation question 2: To what extent has the ISA² programme achieved its objectives - with special focus on the re-use of interoperability solutions across the Union and paying particular attention to the needs expressed by the European public administrations?

- The ISA² programme **achieved its objectives** to some extent. The **main achievements of ISA²** consist in the support to the implementation of EU policies and actions through interoperability solutions, the facilitation of the re-use of interoperability solutions, and the contribution to the promotion of a holistic approach to interoperability in the EU.
- Several factors contribute to the performance of the programme, including the need for public administrations to increase their efficiency due to budget constraints. The programme responded to the **need for common interoperable tools** of public administrations and helped mitigate budgetary concerns to a certain extent through the solutions provided.
- More could be done in the future to fully achieve the objectives that were pursued by the programme. The **take-up of solutions** could be further increased under the Digital Europe Programme by ensuring **clear dissemination and providing one-stop-shop solutions** that allow users to clearly see and access available resources. In addition, future actions could focus on bringing solutions to maturity. In this regard, the Digital Europe Programme and the future strategy for interoperability in the EU's public sector could **focus the efforts on developing a smaller set of key mature solutions**, continually developing them and nurturing their take-up.
- The evaluation also considered how effective ISA² was in contributing to the **principles listed in Art. 4(b) of the ISA² Decision**, in line with the requirements set in the ISA² Decision. The different solutions and outputs of ISA² were found to have contributed to the principles listed in the Decision.

Evaluation question 3: Are there aspects (e.g., objectives, actions) that are more or less effective than others, and if so, what lessons can be drawn from this?

- In the case of several objectives and expected results, the programme was relatively less effective: the identification of legislation gaps hampering interoperability, the assessment of ICT implications of EU law, and the development of methods to quantify the benefits of interoperability solutions.
- Future initiatives, building on the experience with the ISA² programme, could consider developing **metrics and methodologies to assess cost-savings stemming from the use of interoperable solutions as well as more qualitative impacts**, for instance enhanced user-friendliness and simpler processes in e-administrations at different levels (EU, national, sub-national).
- Another area of improvement is the **identification of legislation gaps**, both at the EU and national levels, that hamper cross-border and cross-sectoral interoperability and **the assessment of ICT implications of Union law**. With an ever-evolving legislative landscape, the recent work done under the ISA² programme should be continued in the future to keep up with changes and deliver more results.
- In addition, considering the importance of **standardisation for interoperability**, a stronger and more systematic link with standards developing organisations could further improve the results achieved so far. Future EU initiatives could put more emphasis on raising awareness of the key role of standards in supporting the twin green and digital transitions,

engaging standardisation organisations and national trade associations in the process.

5.1 Introduction

Over its five-year duration, the ISA² programme was **expected to achieve a series of objectives and results**, such as supporting the re-use of interoperable digital solutions in the public sector and promoting a coherent interoperability landscape in the EU. To understand how far the programme has been effective, this chapter lays out an analysis of the expected and actual results of ISA², how the benefits realised relate to the objectives of the programme, and what other factors have played an important role in its performance. More specifically, this chapter provides evidence supporting the following **evaluation questions**:

- To what extent has the ISA² programme achieved its objectives - with special focus on the re-use of interoperability solutions across the Union and paying particular attention to the needs expressed by the European public administrations?
- Are there aspects (e.g., objectives, actions) that are more or less effective than others, and if so, what lessons can be drawn from this?

Throughout the chapter, the analysis focuses on several **judgment criteria** linked to the evaluation questions (see also Annex F):

- Measurement of the indicators summarising the outputs of the programme (performance indicators);
- Alignment between actual and expected results and objectives of the programme;
- Impact of external factors on the performance of the programme;
- Degree of alignment with principles spelled out in Article 4 of the ISA² Decision;
- Awareness of the programme.

5.2 Analysis

This section first looks at the main outputs of the programme and outlines the indicators to assess their performance. The overview of outputs – which are mainly consisting of the solutions developed as part of ISA²– provides one part of the picture of the results of the programme. In the remainder of the section, the actual results are discussed in relation to the objectives of the programme and the expected results, taking into account the role of positive and negative external factors and the overall awareness of the programme.

Performance indicators for the solutions of the sampled actions

The ISA² dashboard and the webpages dedicated to ISA² actions and solutions provide a variety of information and data that can be used to assess the performance of outputs of the ISA² programme. In line with the evaluation framework (see Annex F), **data were collected on several performance indicators** to assess the achievement of the operational objectives of the programme.

The different stages of development of the actions need to be taken into account when analysing the achievement of objectives and expected results. In this regard, it is important to distinguish between actions continued from the previous programme (ISA) and actions initiated during ISA². One additional observation is that following the completion of the Interim Evaluation of ISA²³⁶ one new ISA² action was implemented, namely the “Interoperability Academy” (this new action has been included in the sample of actions analysed as part of the desk research).

³⁶ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

For the 21 sampled actions, 72 outputs can be identified, including 34 solutions in the form of common tools/services, common frameworks, and common specifications or standards (see Annex G.1), **as well as 38 publications**. The outputs in the form of publications include studies, reports, and academic papers. Based on the information available on the ISA² website, particularly the webpages dedicated to ISA² actions and solutions, the sampled actions contributed to 38 publications, with the majority having been published in the second half of the programme (for a full overview please see Annex G.4). Out of the 34 solutions developed, nine have been newly developed as part of actions initiated under the ISA² programme (see Table 5 below).

Table 5 Types of ISA² solutions developed as part of the sampled actions

Type of solution	Number of solutions	New solutions developed by ISA ²
Common tools/services	22	6
Common frameworks	9	2
Common specifications/standards	3	1
Publications	38	
TOTAL	34 (72 considering the publications made available)	9 (47 considering the publications made available)

Source: Authors' elaboration based on the ISA² Work Programmes and the information available on the ISA² website, particularly the webpages dedicated to ISA² actions and solutions.

In addition, for the action Raising Interoperability Awareness – Communication Activities, which is part of the Accompanying measures package, the action outputs are represented by events organised as part of the ISA² programme or events to which ISA² representatives actively contributed (see Box 4 and Annex G.5).

Box 4 Overview of communication activities

Through the events organised as part of the ISA² programme, including conferences, workshops, and webinars, the programme reached diverse stakeholders from different countries, helping to promote interoperability among them. Throughout the duration of the programme, a total of 50 ISA² funded events have been organised across the EU, both online and in several countries: Belgium, Bulgaria, Finland, Greece, Italy, Luxembourg, Malta and Romania. With the outbreak of the COVID-19 pandemic, most of the events organised in 2020 were exclusively online. In addition, ISA² representatives actively participated in events that took place in 20 EU countries and two non-EU countries, namely Montenegro and Serbia.

When it comes to performance indicators, an array of metrics can be used to assess the effectiveness of solutions, for example, the number of users, the instances of use, the number of downloads, or the number of page views. **The performance of ISA² solutions can thus be characterised in multiple ways, depending on the type of output.** Examples of the outputs include³⁷:

- 16,092 professionals working in the field of e-Government are registered on Joinup in order to access interoperability solutions and collaborate with each other;
- Over 29,200 surveys have been created so far using the ISA² EUSurvey solution;
- The European Single Procurement Document (ESPD) solution has been downloaded over 35,000 times from Joinup;
- 36 educational and training resources have been published in the Interoperability Academy Catalogue of Educational and Training Resources, designed to enhance digital skills and support the delivery of digital and interoperable public services;

³⁷ The data presented below reflects the state of play as of 14 January 2021.

- 141 assessments of digital public services were performed using the Interoperability Maturity Assessment of a Public Service (IMAPS) solution between 2018 and 2020.

Additional performance indicators, collected as part of the desk review of secondary data, are presented throughout the chapter. A full overview is included in Annex G.2.

Alignment between actual and expected results and objectives

At the time of its adoption, the ISA² programme, through its solutions, set out to contribute to a set of general, specific, and operational objectives. After five years, the programme and its solutions have contributed to the achievement of these objectives at least to some extent, according to the consulted stakeholders (see Figure 8). At the level of the **general and specific objectives**, the majority of respondents confirm that the following objectives were achieved to some extent or to a great extent:

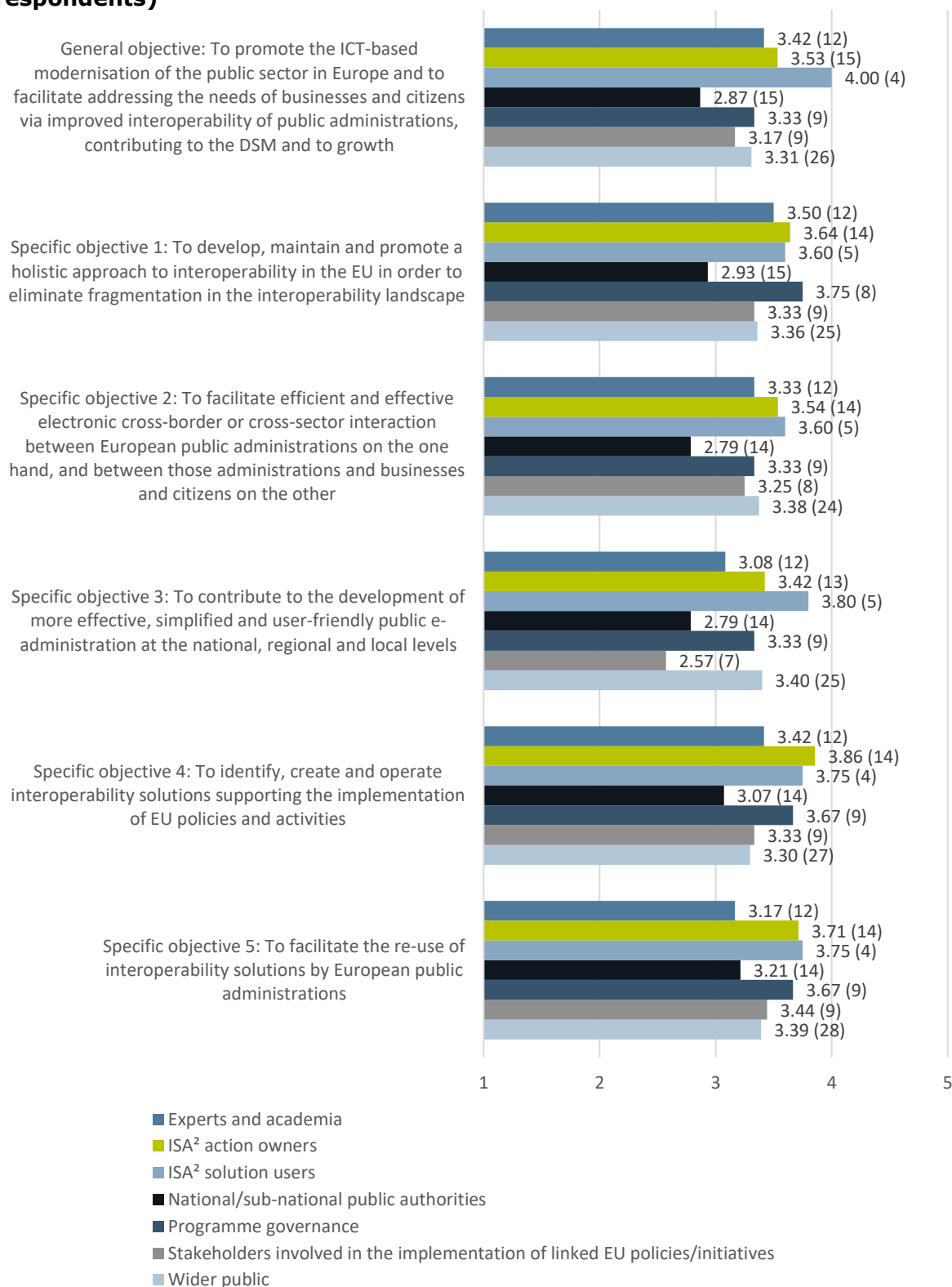
- **“Identifying, creating, and operating interoperability solutions supporting the implementation of EU policies and actions”** (specific objective 4; overall average score of 3.43 out of 5). In this regard, an example of ISA² action that has contributed to the implementation of EU policies and actions is the [EIF implementation and governance models](#), having supported the implementation of the EIF;
- **“Facilitating the re-use of interoperability solutions”** (specific objective 5; overall average score of 3.43 out of 5); the [Joinup](#) action, for instance, through the platform with the same name that it supports, provides a comprehensive overview of existing interoperable solutions, thus contributing to raising awareness and encouraging re-use;
- **“Developing, maintaining and promoting a holistic approach to interoperability in the EU”** (specific objective 1; overall average score of 3.39 out of 5), with ISA² playing an important part in raising awareness about interoperability, having set up structures for cooperation with the Member States (the ISA² Committee), and supporting the promotion and monitoring of the implementation of the EIF.

Limited contributions are seen, especially by stakeholders involved in the implementation of linked EU policies/initiatives, when it comes to “developing more effective, simplified and user-friendly public e-administration at the national, regional and local levels” (specific objective 3; overall average score of 3.20 out of 5). In addition, the interim evaluation of the programme also identified more limited contributions in this sense³⁸.

Out of all consulted stakeholder groups, respondents among national and sub-national public authorities gave the relatively lowest scores to the achievement of objectives. Nevertheless, it must also be noted that this stakeholder group also reported a relatively lower level of knowledge of the ISA² programme, in comparison to other stakeholder groups (see the discussion of the reported expertise of stakeholders based on Figure 3 in Chapter 3). At the opposite end, consulted ISA² solution users and action owners, who are decidedly more knowledgeable about the programme, generally consider that ISA² has contributed to a greater extent to the objectives.

³⁸ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission, p. 41.

Figure 8 Extent to which ISA² solutions contributed to achieving the programme's objectives (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 90 (General objective), 88 (Specific objective 1), 86 (Specific objective 2), 85 (Specific objective 3), 89 (Specific objective 4), 90 (Specific objective 5).

At the level of **operational objectives**, the majority of respondents indicated **significant contributions of the ISA² programme** to the following objectives (see Figure 9):

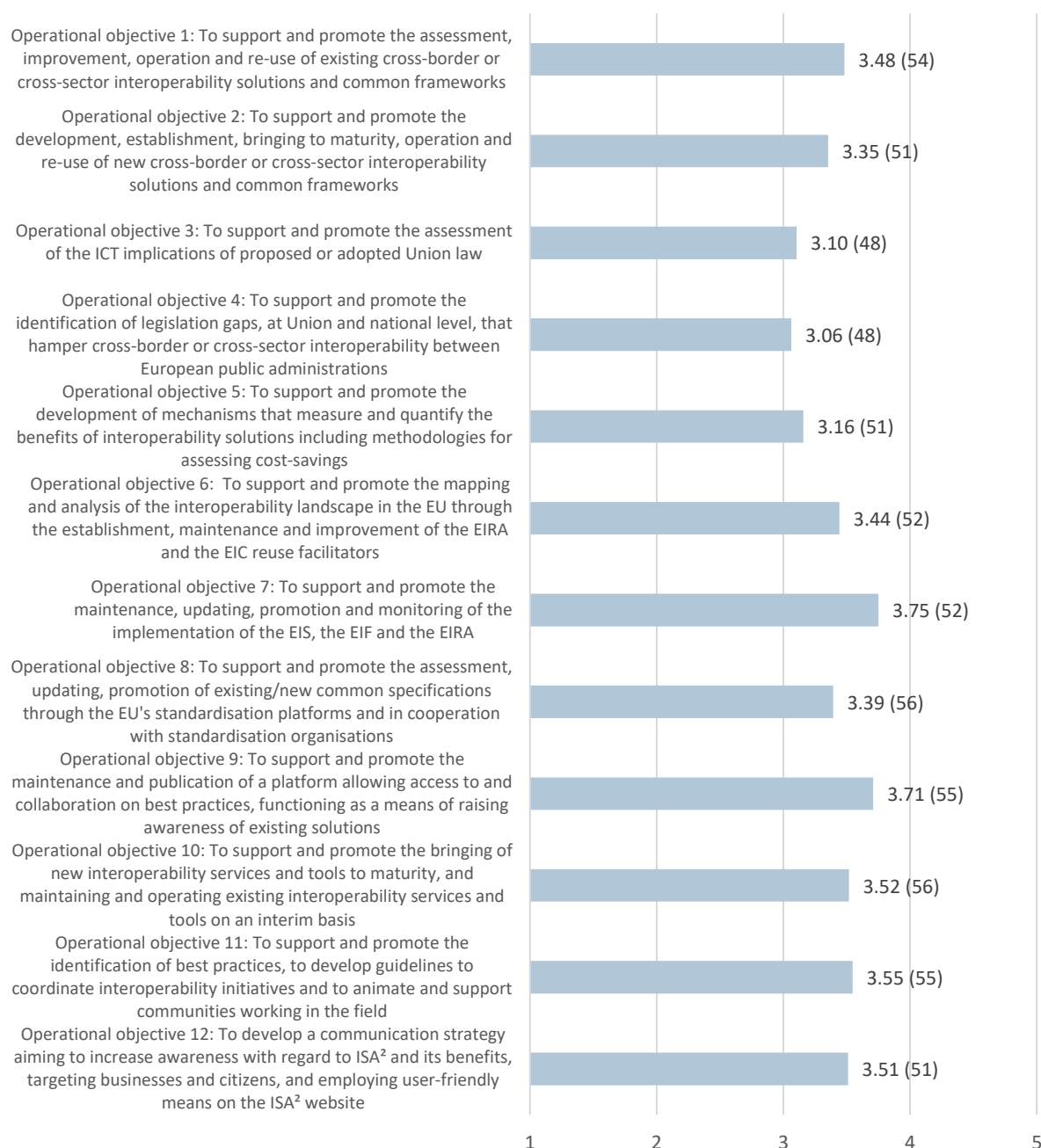
- “the maintenance, updating, promotion and monitoring of the implementation of the EIS, the EIF and the EIRA” (operational objective 7) and
- supporting and promoting “a platform allowing access to and collaboration on best practices, functioning as a means of raising awareness of existing solutions” (operational objective 9).

In this regard, **the following actions play a particularly important role: NIFO**, through its monitoring of national interoperability frameworks (NIFs) and the setting up of the EIF monitoring mechanism; the **European Interoperability Architecture (EIA)** action by contributing relevant building blocks for interoperability and supporting re-use through the **EIRA solution** and **Joinup**, a platform facilitating the sharing of interoperability solutions and contributing to the creation of a community on interoperability across the EU.

Several **areas for improvement** still remain. More limited contributions from ISA² are seen when it comes to the “identification of legislation gaps at the Union and national level that hamper cross-border and cross-sectoral interoperability” and the assessment of ICT implications of Union law (operational objectives 3 and 4) as well as the “development of mechanisms to measure and quantify the benefits of interoperability solutions including methodologies for assessing cost-savings” (operational objective 5).

One of the recurrent issues pointed out by consulted stakeholders is the effect of the wideness of the range of actions supported by the programme on the overall effectiveness of the programme. While the programme is relatively small in terms of budget, ISA² aims to achieve a long list of detailed objectives focused in multiple areas. **Concentrating the efforts on a more limited set of actions and solutions may be more effective** and it may give more room for selected solutions to be scaled up more quickly and ultimately enhance take-up of the outputs, beyond what has been achieved so far, as emphasised by several representatives of public authorities at the EU and the national levels (who contributed to the targeted consultations). The selection of actions to focus on could be done by taking into account the achieved objectives, the need for further action in particular areas and the extent to which synergies with relevant programmes can be fostered to support the continual maintenance of mature solutions and provide support to scale up solutions in areas in which action is deemed necessary.

Figure 9 Extent to which ISA² solutions contributed to achieving the programme’s operational objectives (average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: The average score is based on the answers received through targeted consultations. Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents for each objective from top to bottom: 54, 51, 48, 48, 51, 52, 52, 56, 55, 56, 55, 51.

Box 5 In detail: the contributions of actions to key ISA² objectives

Evidence from desk research shows the specific contributions of different ISA² solutions to the following key objectives to which ISA² solutions contributed in particular (as emphasised by the feedback from stakeholders to both the targeted and public consultations):

- "Identifying, creating, and operating interoperability solutions supporting the implementation of EU policies and actions" (specific objective 4);

- “Facilitating the re-use of interoperability solutions” (specific objective 5);
- “Developing, maintaining and promoting a holistic approach to interoperability in the EU” (specific objective 1).

Supporting the implementation of EU policies and actions

Interoperability, as a key enabler of digitalisation, plays an important role in various initiatives and policies of the EU. ISA² actions and solutions have provided support and inputs for the development, implementation and monitoring of several initiatives.

To support the implementation of the **SDG Regulation**, a dedicated ISA² action was set up in 2018 (“Interoperability requirements for the Single Digital Gateway implementation”). The action provided technical support by identifying specific interoperability challenges for this initiative and outlining the IT architecture of the SDG. The work resulted in a study published in 2018, comprising the common architecture for the Gateway, as well as functional, technical and business-process related requirements informing the implementation of the Regulation³⁹.

In the field of **open data**, the “Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification” action has contributed to improving the processing, sharing, and visualisation of data by developing the “Catalogue of data visualisation tools (part of the EU Open Data portal)”. The catalogue contains over 30 visualisation tools, trainings, examples and re-usable visualisations openly accessible to a variety of users.

When it comes to **stakeholder collaboration in the policymaking process**, the “REFIT Platform” action has contributed to the implementation of the 2015 Communication “Better regulation for better results - An EU agenda”⁴⁰. As part of the Communication the implementation of an IT solution in the form of a collaborative platform was seen as necessary to support “an invaluable source of suggestions to improve EU laws”. The ISA² programme contributed with the development of the IT tool between 2017 and 2018. The mandate of the REFIT Platform ended in October 2019.

In the field of **spatial data**, the [European Location Interoperability Solutions for e-Government \(ELISE\)](#) action has been supporting the implementation of the **INSPIRE Directive**. The action has developed several solutions in this regard, including the [open source ETF testing framework](#) and the INSPIRE Reference Validator (an implementation of the former), the open source Re3gistry software and the INSPIRE Registry (an implementation of the former) and supporting studies. The INSPIRE Reference Validator is a reusable open source tool which allows users to check whether metadata, data sets and network services are in line with the requirements defined in the INSPIRE Implementing Rules and the Technical Guidelines. The INSPIRE registry acts as a central access point for several INSPIRE registers. Finally, several studies have supported the implementation of the INSPIRE Directive: “INSPIRE-MMTIS, overlap in standards related to the Delegated Regulation (EU) 2017/1926”, published in 2019; and the “Study of the terms of use applied in the INSPIRE resources and their usability barriers”, published in 2018 (see Annex G.4).

Facilitating the re-use of interoperability solutions

When it comes to the re-use of solutions, several ISA² actions are working on **disseminating information** about existing interoperability solutions and encouraging

³⁹ Everis (2018), “Study on functional, technical and semantic interoperability requirements for the single digital gateway (SDG) implementation”, available at: https://ec.europa.eu/isa2/sites/default/files/dlv06.01-final_report.pdf

⁴⁰ COM/2015/0215 final, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions, Better regulation for better results - An EU agenda

users to take advantage of available resources. The **Joinup platform** houses 2,934 Solutions created within 147 Collections (thematic collaborative spaces), with ISA² solutions counting among these. The **Interoperability Academy**, an ISA² action launched in 2019, fosters not only the dissemination of information around ISA² solutions, but also contributes to advancing digital skills in the public sector. As part of this action, a "[Catalogue of Educational Training Resources](#)" has been developed, bringing together learning resources generated as part of the ISA² programme and the CEF programme, making them jointly accessible to interested stakeholders and thus contributing to a more comprehensive and cohesive overview of available resources. By January 2021, 35 packages of resources had been made available (see Annex G.2).

Developing a holistic approach to interoperability in the EU

At the more **horizontal level**, cutting across policy areas, ISA² has supported the development, monitoring and evaluation of the EIF and the IAP, as one of the main implementing instruments of the EIF. The ISA² actions contribute to the 22 key actions outlined by the IAP (for a comprehensive overview, see Annex G.8).

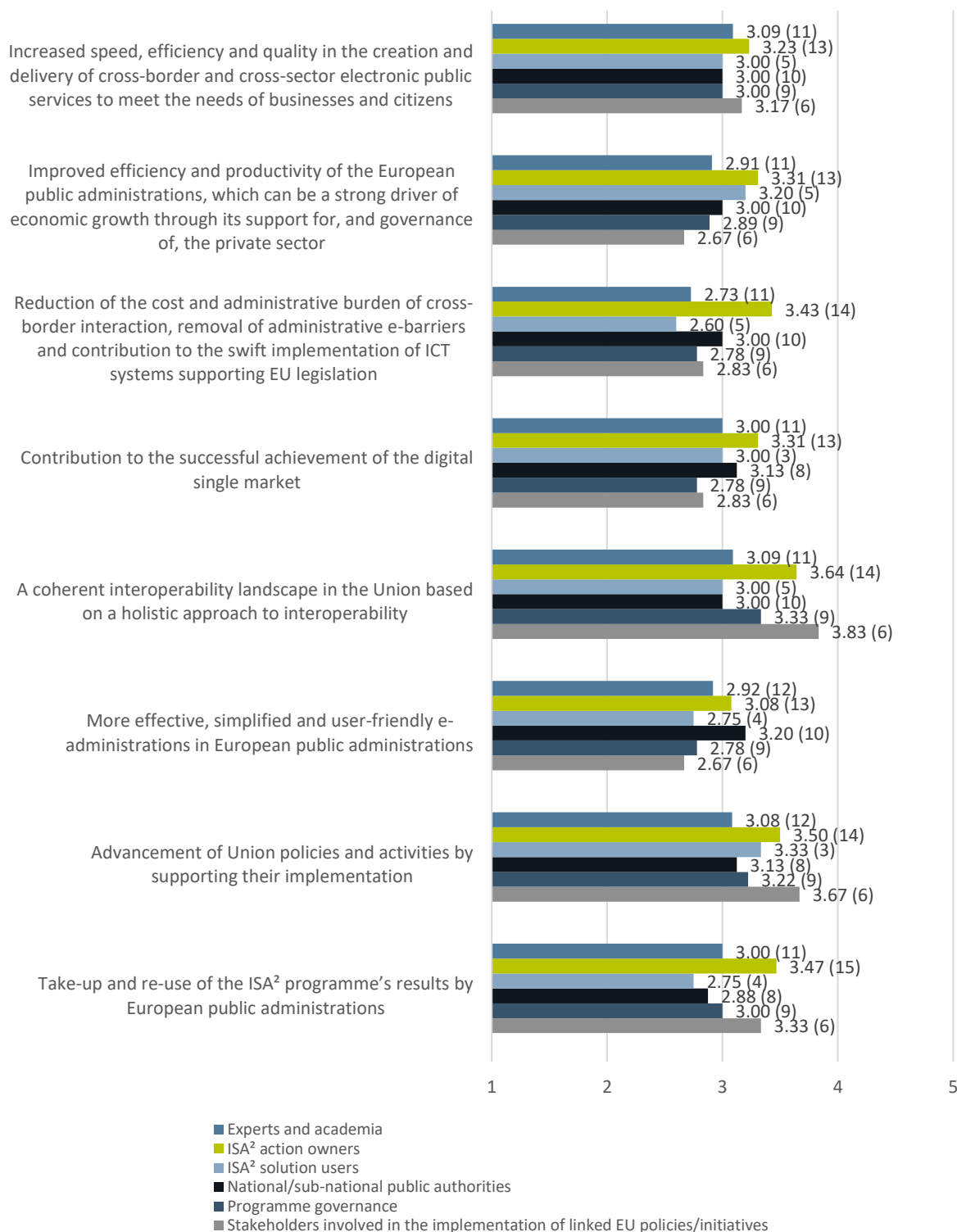
By comparing the **expected and actual results** of the ISA² programme (see Figure 10) a similar picture emerges to the alignment between the achievements of ISA² in relation to its objectives. To some extent, the actual results reflect the expected results, but more work remains to be done to fully achieve the expected results in the field. **ISA² has contributed particularly to:**

- "A coherent interoperability landscape in the Union based on a holistic approach to interoperability" by facilitating cooperation between Member States as part of the ISA² Committee and contributing to raising awareness of the benefits of interoperability through communication activities;
- "The advancement of Union policies and activities by supporting their implementation" with the solutions of the [ELISE](#) action supporting, among others, the implementation of the INSPIRE Directive and the EIF⁴¹, and actions such as [NIFO](#) and the [EIF implementation and governance models](#) action the implementation of the EIF.

Conversely, according to the majority of respondents across stakeholder groups, results have been **achieved only to a limited extent** or to some extent when it comes to reducing the cost and administrative burden of cross-border interaction, removing the administrative e-barriers and contributing to the swift implementation of ICT systems supporting EU legislation. Similarly, only limited results are observed by the stakeholders when it comes to contributing to more effective, simplified and user-friendly e-administrations in European public administrations. The limitations identified reflect the feedback on the achievement of the objectives by emphasising that more could be done to develop methodologies for assessing cost-savings derived from the implementation of interoperability solutions. Without the proper tools for measuring efficiency, it is difficult to assess improvements in the efficiency of public administrations resulting from enhanced interoperability. A generally lower confidence can be noted for respondents among experts and academia, with an average score of 2.89/5 for 11 respondents (Figure 10).

⁴¹ ELISE has also provided direct support to several other sector policies, including the Energy Performance and Buildings Directive (EPBD), the Energy Efficiency Directive (EED), and Intelligent Transport Systems. For more details please see: https://ec.europa.eu/isa2/actions/elise_en

Figure 10 Extent to which ISA² solutions achieved the expected results of the programme (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents for each result from top to bottom: 54, 54, 55, 50, 55, 54, 52, 53.

Box 6 Areas of more limited effectiveness: expected and actual results

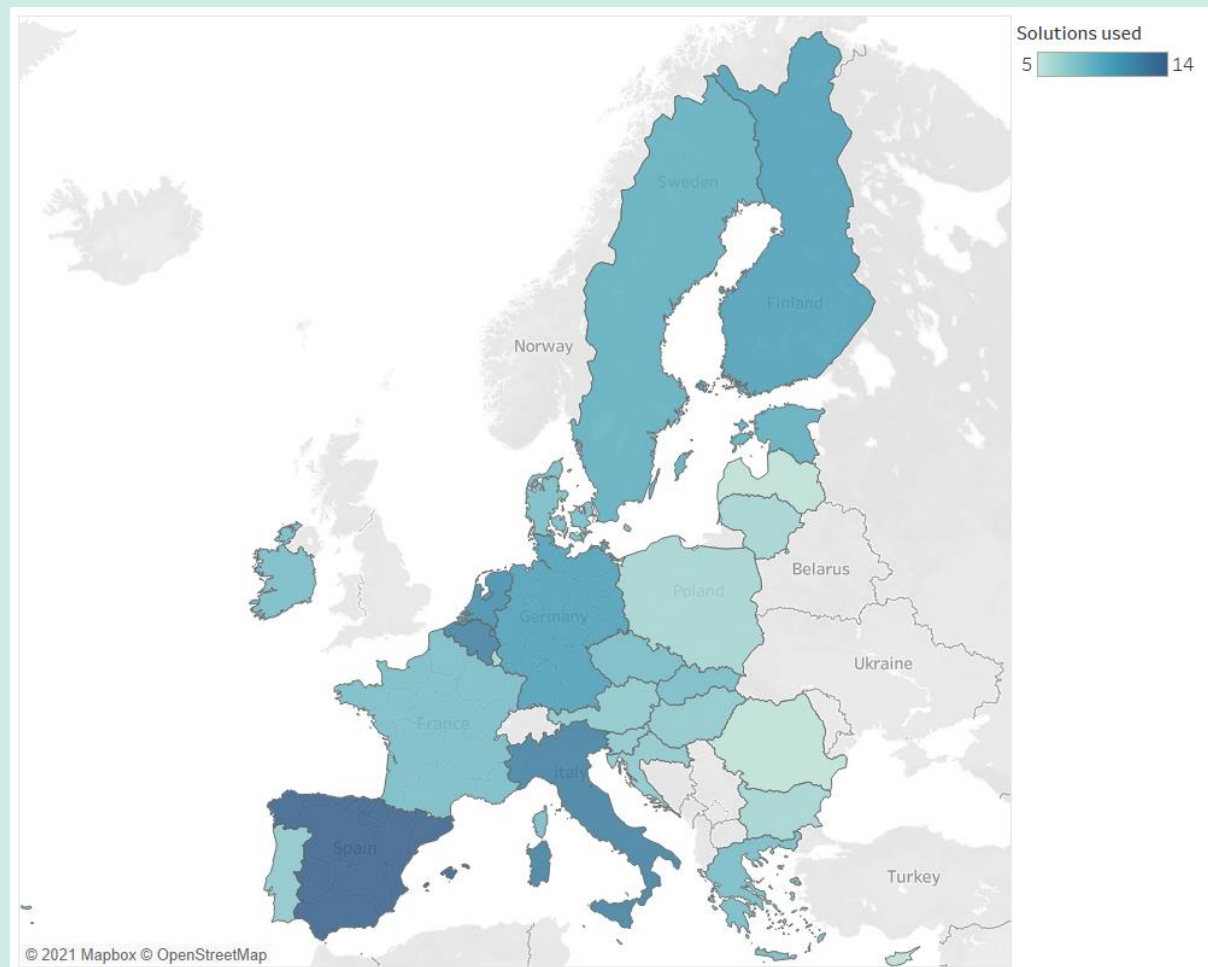
Comparing the expected results to what has been achieved during the lifetime of the programme, more could be done in the future to develop **metrics and methodologies to assess cost-savings stemming from the use of interoperable solutions as well as their more qualitative impacts**, for instance enhanced user-friendliness and simpler processes in e-administrations at different levels (EU, national, sub-national).

Some studies and reports provide an overview of potential benefits and discuss specific use cases. For instance, the study "Use cases and benefits of ISA² specifications", developed as part of the SEMIC action and published in 2019 lays out some of the specific expected benefits deriving from the implementation of semantic specifications (including the Core Vocabularies and Data Catalogue Vocabulary Application Profile for Data Portals in Europe, i.e. DCAT-AP) by relying on practical examples. The purpose of the study is, among others, to promote the benefits arising from the semantic specifications developed as part of ISA² and encourage further take-up. Such a study contributes to a greater awareness of potential cost-savings and qualitative benefits and could be used to help build a concrete and comprehensive picture of achieved benefits. When looking at the general overall progress in enhancing interoperability across the EU, the "[eGovernment Factsheets Anniversary Report](#)", developed as part of the NIFO action and published in 2019, outlined several examples of benefits in the form of cost-savings generated by the introduction of interoperable solutions adopted by Member States, but these are not necessarily ISA² solutions.

Building on such approaches, a **more comprehensive overview of the impacts of interoperable solutions** could be developed, based on a common methodological approach to identify benefits in the form of cost-savings or benefits in the form of improved quality of services, more user-friendliness, etc. Nevertheless, it is important to emphasise the complexity of assessing the costs and benefits of interoperability solutions. As part of the action "Legal Interoperability", the "[Decision supporting tool on interoperability](#)" has been developed in order to provide guidance to policymakers for in assessing the costs and benefits of interoperability. Such approaches could further support the future take-up of common interoperable solutions that have been developed so far under ISA².

The use and re-use of ISA² solutions varies between countries. Based on the sample of 21 actions covered by the evaluation, it is possible to gain relative overview of the use and re-use of ISA² solutions by public administrations across the EU (see Figure 11). Nevertheless, while it is clear that solutions are being re-used across the Member States, **more could be done to enhance their take-up and re-use, especially at regional and local levels**. In this regard, it is important for the work started through the Interoperability Academy to be continued; the catalogue of learning resources can serve as a good basis for public administrations to gain a comprehensive overview of available resources. Another example in this sense is the "[Better legislation for smoother implementation](#)" community on Joinup, which promoted the idea of [digital-ready policymaking](#) and the importance of considering digital aspects, including the use and reuse of existing solutions, already during the policy design phase. The take-up of solutions may be increased in the future by ensuring clear dissemination to public administration and providing one-stop-shop solutions that allow users to clearly see and access available resources. In addition, **channelling the efforts to fewer actions and solutions and bringing these to maturity** would also help increase the take-up of the programme's outputs.

Figure 11 Overview of the use and re-use of solutions by public administrations in the Member States, based on a sample of solutions



*Note: The colour gradient denotes the number of individual ISA² solutions used or re-used by public administrations in the Member States. The analysis counts only overall usage, not individual instances of solution re-use. This assessment is based on 17 solutions that are part of the sampled actions for this evaluation, building on available data on the ISA² solutions webpage.
Source: Authors' elaboration based on the data presented in Annex G.3.*

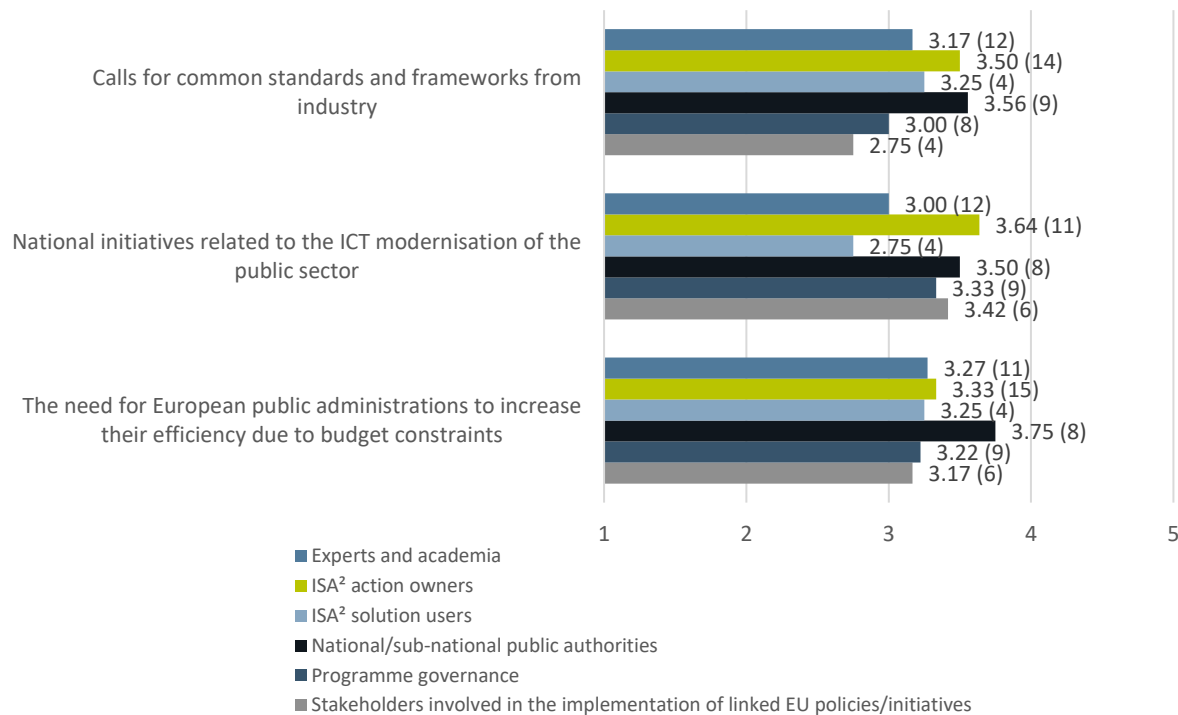
Finally, the independent expert assessments contributing to this evaluation emphasised the role of standards developing organisations. **A stronger and systematic link with standard developing organisations** could help improve the achievements of the programme in several areas such as: further enhancing the coherence of the interoperability initiatives in the EU, supporting the development and updating of common standards and specifications, and mapping the landscape of interoperability solutions and specifications. In this regard, future EU initiatives (i.e. the Digital Europe Programme, the development of the European Data Spaces), taking into account the work done under ISA², could put more emphasis on increasing the awareness about the **key role of standards in the digital transformation strategy and in supporting the twin green and digital transitions, engaging standardisation organisations and national trade associations in the process.** The **importance of bringing solutions to maturity** to enhance their take-up is relevant from the perspective of standards as well. A 2020 report prepared by the **High-Level Expert Group on Business-to-Government Data Sharing** emphasised the need to invest in mature solutions and common standards⁴². In addition, the report of the High-Level Expert Group called for **the Digital Europe Programme to invest in common standards to facilitate data sharing**, taking into consideration the results already achieved as part of the initiatives including the ISA² programme. Importantly, **“the expert group recommends prioritising those standards that are**

most generally used over creating new ones⁴³ and working together with European standardisation bodies in this regard. Moving forward, it will be crucial to agree upon and promote the use of a common set of standards to facilitate data exchanges in the public sector. The role of standardisation is further discussed in Chapter 7 on the coherence of the ISA² programme.

Impact of external factors on the performance of the programme

The effectiveness of the way in which ISA² delivers results has been influenced by a variety of external factors that have either bolstered the programme and its outputs or, on the contrary, hindered them. Respondents from all stakeholder groups confirm that **several factors contribute to the performance of the programme** (Figure 12). Particularly important is the need for public administrations to increase their efficiency due to budget constraints, as was emphasised by public authorities who consider that this factor has contributed to a great extent to the performance of ISA². In fact, the solutions provided by the programme respond to a need for common interoperable tools among public administrations and help mitigate budgetary concerns to a certain extent. Besides, ISA² action owners emphasised that national initiatives aimed at the ICT modernisation of the public sector are also contributing to a great extent to the performance of ISA².

Figure 12 Extent to which the following external factors are contributing to the performance of ISA² (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents for each external factor from top to bottom: 51, 50, 53.

⁴² High-Level Expert Group on Business-to-Government Data Sharing (2020), Report: Towards a European strategy on business-to-government data sharing for the public interest, European Commission. Available at: <https://digital-strategy.ec.europa.eu/en/news/experts-say-privately-held-data-available-european-union-should-be-used-better-and-more>

⁴³ Ibid. p 72.

When it comes to standardisation, experts emphasised its importance based on several trends. Addressing needs such as improved **security** and the introduction of new technologies could lead to wider calls for standardisation and common frameworks. Developing an **infrastructure facilitating end-to-end secure information sharing** in which all aspects are covered is a challenge for public administrations. Ensuring information security is likely to be one of the most important areas for the application of standards, but there is much work to be done in this field. In a similar vein, the use of **blockchain for public service execution** will need to rely on further developments in **standardisation**. A further relevant trend is the increasing role of open source in standardisation, which is likely to drive developments in the field of public sector interoperable solutions.

During the consultation activities, respondents to the targeted consultations identified further external factors having an impact on the performance of the programme. **The COVID-19 pandemic stands out as a unique factor**, a shock that has prompted discussions about the urgent need for digital and interoperable solutions to manage the ensuing public health crisis. The pandemic has thus been an **important factor in bringing the issues of interoperability into the spotlight**, underlining the importance of the ISA² programme. As part of ISA², the "[Digital Response to COVID-19](#)" collection was set up on Joinup to bring together a variety of resources including tools and data (such as open source software, open data, websites, platforms and events) that could be useful for public administrations, citizens and businesses in managing the pandemic.

Other positive factors include:

- Supporting policies at the EU level such as the SDG Regulation⁴⁴, the SRSP⁴⁵, digital and data strategies (e.g., the Open Data Directive⁴⁶, the eIDAS Regulation⁴⁷, the [Data Strategy](#), the [AI Strategy](#)) that play an important part, either by addressing the needs for interoperable data and processes or by providing support through for the digital transformation of the public sector;
- Ministerial declarations that reinforce the political support for interoperability initiatives, such as was the case with the [Tallinn Declaration](#) in 2017 and more recently with the [Berlin Declaration](#) in December 2020; and
- Technological advancements and the general digital transformation of the society that play an important role as well, as individuals have higher expectations for public sector services based on technological developments in the private sector.

Nevertheless, there are also **factors that can have a negative effect** on performance of the programme (Figure 13). **Legal and institutional complexity stand out** as factors having a negative impact to a great extent on how the programme delivers its results (across all stakeholder groups, the legal complexity scored an average of 3.73 out of 5 and the institutional complexities scored an average of 3.64 out of 5). Experts and academia have been the most vocal in expressing their concerns about the impact of these factors. On the one hand, legal complexities arise from **different rules and legal requirements that may limit the flexibility of public administrations to adopt**

⁴⁴ Regulation (EU) 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1724&from=EN>

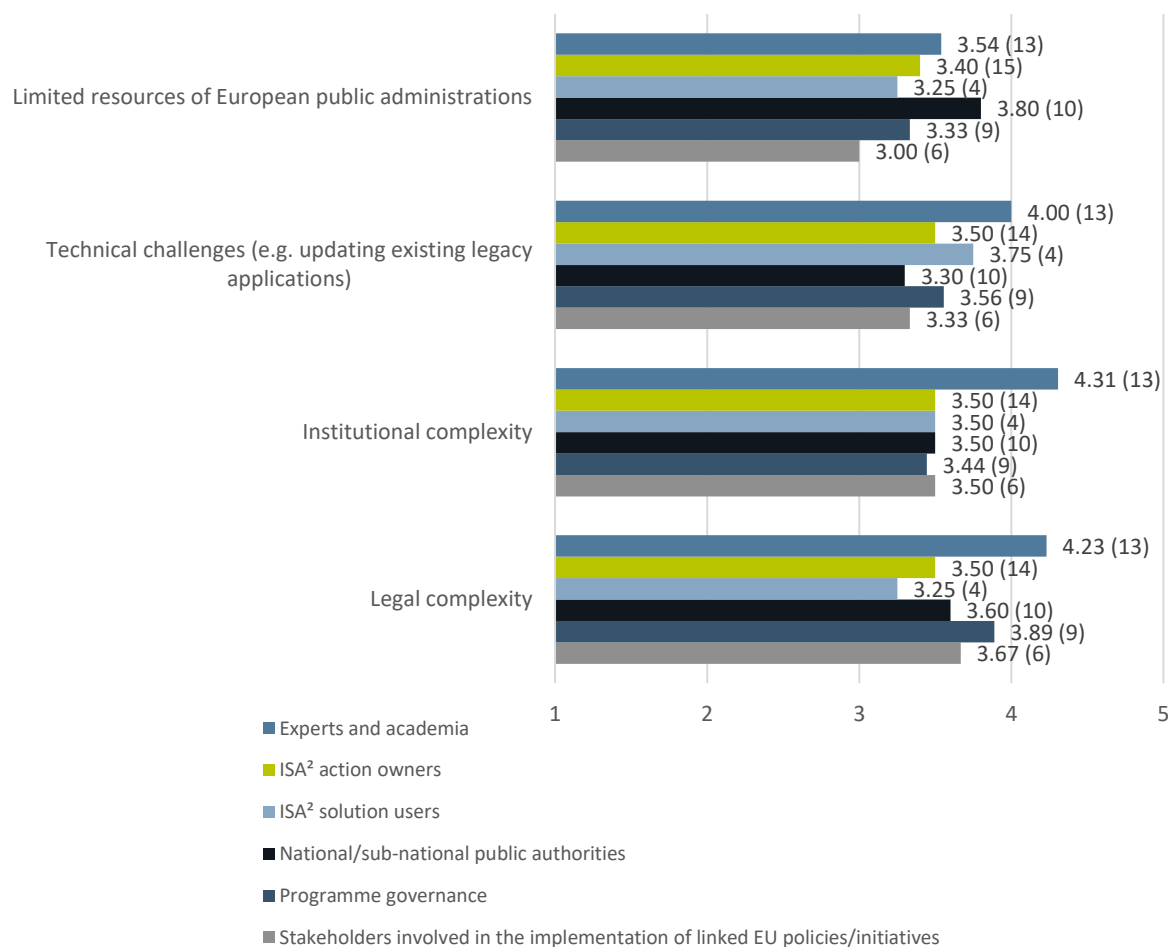
⁴⁵ The SRSP was active between 2017 and 2020, having been replaced by the Technical Support Instrument (TSI) for the period 2021 to 2027. For further details please see: https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/technical-support-instrument-tsi_en

⁴⁶ Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561563110433&uri=CELEX:32019L1024>

⁴⁷ Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L.2014.257.01.0073.01.ENG>

flexible and interoperable solutions for the delivery of (digital) public services. Institutional complexity, on the other hand, derives from the **different levels of governance in the EU and the different organisational setups of public administrations at the national, regional, and local levels**. Among the consulted stakeholder groups, experts and academia in particular consider that institutional complexity can jeopardise the programme’s performance to a great extent (with average scores of 4.23 out of 5 based on 13 respondents). Institutional complexity is exacerbated by the presence of silos in institutions.

Figure 13 Extent to which the following external factors are jeopardising the performance of ISA² (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents for each external factor from top to bottom: 57, 56, 56, 56.

The independent expert assessments further emphasise that **institutional complexity** manifests itself in several different ways: the multilevel governance in the EU, the complex public administration systems at the national and sub-national levels, and decentralisation in some Member States. On top of this, as cooperation between the public and private sectors becomes more central in the provision of quality services, this interplay introduces an additional level of complexity.

Legal and institutional complexities are addressed by the ISA² programme. While such factors are difficult to resolve and fully address, **several ISA² actions have focused on improving legal interoperability** (such as is the case of the [Legal interoperability](#)

action⁴⁸ which has focused on enhancing legal interoperability within the EU by developing a methodology for the legal screening of EU legal acts and developing guidelines for ICT impact assessment among others) **and organisational interoperability** (e.g., the action “EIF implementation and governance models”⁴⁹, supporting the implementation of the EIF, providing guidance on governance structures and describing good practices to enhance coordination for more interoperability).

Stakeholders consulted via the targeted consultation activities also indicate that technical challenges have a negative impact on the performance of the programme. The **independent expert assessments** reinforce this point. When it comes to **technical challenges**, the updating of existing legacy applications does not only concern intrinsic efforts and costs, but also the **strategic decisions** to be made when updating existing applications. In particular, the question of which provider to choose becomes central – whether this means private companies, EU-based or not, or public sector solutions. Key questions need to be considered in the future roll out of interoperability programmes and frameworks at the EU level: **what strategic decisions to make regarding the technical transition** and **how to ensure that the public and private sectors cooperate effectively** to deliver digital interoperable services in the public sector. In fact, this question is well reflected in the drive towards digital sovereignty which was expressed clearly in the [Berlin Declaration](#), for instance.

The feedback from stakeholders pointed out **additional negative factors** for the performance of the programme and needs that should be addressed:

- The way that activities of the programme are communicated to stakeholders may have an impact on their awareness. As the programme is fairly technical in nature the **communication needs to be as clear as possible and not too technical** in order to reach a broader audience and lead to better results. Interoperability should be promoted as a means to an end, not as an end in itself.
- Another factor linked to organisational interoperability is the need **for stronger connections between ISA² and the DGs of the Commission**, through enhanced communication and synergies.
- Finally, there continues to be a certain **“natural” resistance of public organisations to the disclosure of their data**, as documented in an analysis by Ruijter, Détienne, Baker, Groff, Meijer (2020)⁵⁰.

Awareness of the programme

To gain a comprehensive overview of the programme’s results, it is important to take into account the level of knowledge of consulted stakeholders both generally in the field of digital public services and interoperability, as well as more specifically when it comes to the ISA² programme (see Figure 14). On average, consulted stakeholders across stakeholder groups have a very good knowledge of the field of digital public services and interoperability (with an overall average of 3.9 out of 5 for the 100 respondents who completed this question). As would be expected, stakeholders involved in the governance of the ISA² programme report the highest level of familiarity with this field (with an average response score of 4.22 out of 5, based on nine respondents), followed by consulted experts and academic stakeholders (with an average response score of 4.15 out of 5, based on 13 respondents). In contrast, and once again as would be expected, the wider public reported a relatively lower level of knowledge compared to the other consulted

⁴⁸ For further details please see: ISA² - Interoperability solutions for public administrations, businesses and citizens, “Contributing to efficient implementation of EU law”, https://ec.europa.eu/isa2/actions/legal-interoperability_en

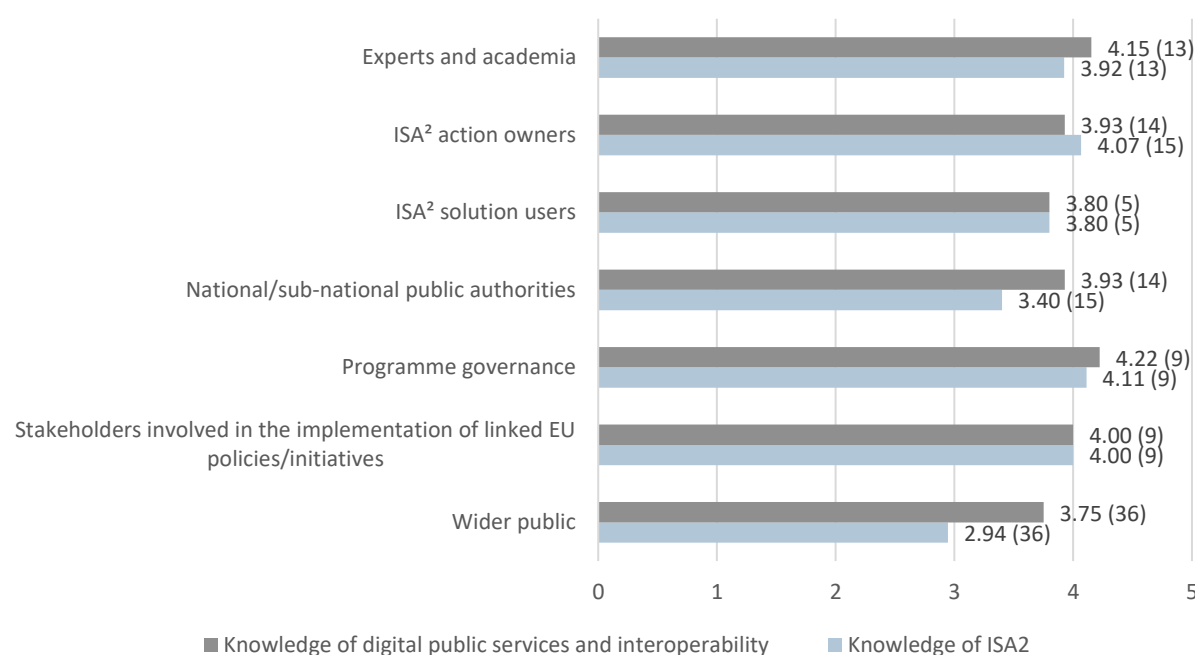
⁴⁹ For further details please see: ISA² - Interoperability solutions for public administrations, businesses and citizens, “The role of interoperability in organisations”, https://ec.europa.eu/isa2/actions/continuously-updating-european-interoperability-strategy_en

⁵⁰ Ruijter, E., Détienne, F., Baker, M., Groff, J., & Meijer, A. J. (2020). The Politics of Open Government Data: Understanding Organizational Responses to Pressure for More Transparency. The American Review of Public Administration, 50(3), 260–274. <https://doi.org/10.1177/0275074019888065>

stakeholders, but still indicated a good knowledge of the field (with an average score of 3.75 out of 5, based on 36 respondents).

Regarding the familiarity of consulted stakeholders with the ISA² programme, there are two main observations to be discussed. First, it is evident and would be expected that stakeholders involved in the implementation and overall governance of the programme would indicate the highest level of familiarity with ISA². Indeed, on average the respondents involved in the governance of ISA² are most familiar with the programme (with an average score of 4.11 out of 5, based on 9 responses), followed by ISA² action owners (average score of 4.07 out of 5 based on 15 responses). At the opposite end of the scale, the wider public is least knowledgeable compared to the other stakeholder groups (average score of 2.94 out of 5, based on 36 responses). Given the breadth of topics covered by ISA², such a distribution makes sense, especially as some consulted stakeholders also mentioned that they are familiar with some aspects of the programme, but not with all. In fact, looking at the familiarity of consulted stakeholders with specific action packages, this becomes evident (refer to Figure 4 in Chapter 3): most consulted stakeholders have a good knowledge of three packages; consulted stakeholders who are more actively engaged with the programme have a better grasp of more packages out of the nine packages supported by ISA².

Figure 14 Consulted stakeholders’ familiarity with digital public services and interoperability and the ISA² programme



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

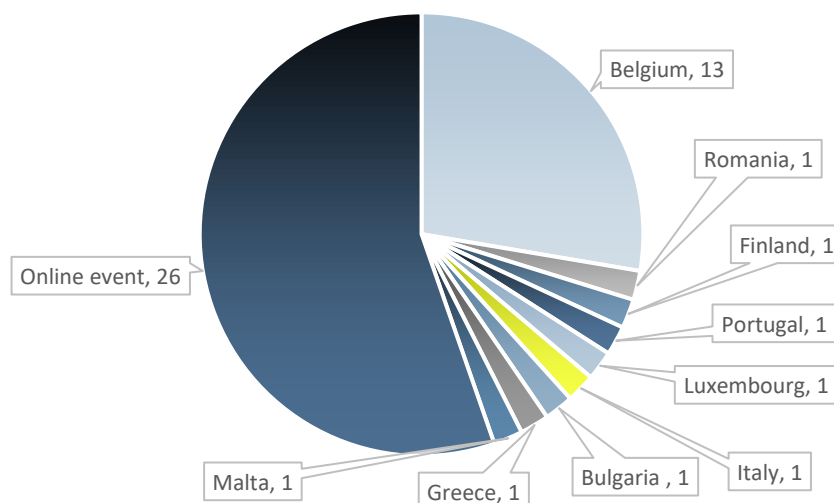
Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents: 100 (Knowledge of digital public services and interoperability) and 102 (Knowledge of ISA²).

In this context, it is important to look at the activities undertaken during the ISA² programme in order to increase awareness about the programme and the benefits deriving from a more coherent interoperable landscape in the EU.

The overview of ISA² funded events shows the added value of an EU-level programme for the interoperability of public services. Through the events organised as part of the ISA² programme, including conferences, workshops, and webinars, the programme reached diverse stakeholders from different countries, helping to promote interoperability among

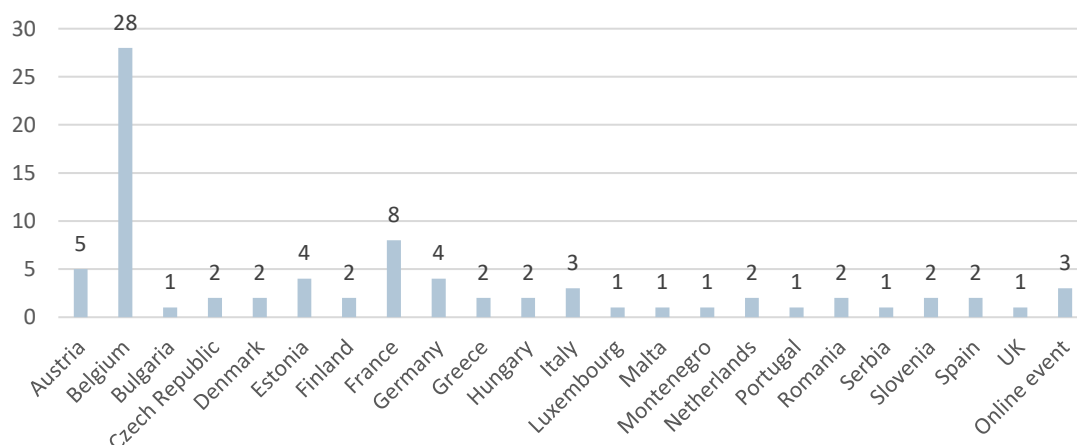
them. Throughout the duration of the programme, ISA² funded events have been organised across the EU, with a majority concentrated in Belgium, but also including countries from the different regions of the EU (see Figure 15). With the outbreak of the COVID-19 pandemic, most of the events organised in 2020 were exclusively online, a fact that is reflected in the overall share of online events in the overview of activities organised. In addition, ISA² representatives actively participated in non-ISA² events that took place in 20 EU countries and two non-EU countries, namely Montenegro and Serbia (Figure 16).

Figure 15 Overview of the number of events funded by ISA² between 2016 and 2020



Source: Authors' elaboration on the list of events funded by ISA² (see Annex G.5).

Figure 16 Overview of the number of non-ISA² funded events in which ISA² representatives played an active role (2016 - 2020)



Source: Authors' elaboration on the list of events funded by ISA² (see Annex G.5).

Contribution to the principles listed in Art. 4(b) of the ISA² Decision

Finally, the different solutions and outputs of the ISA² programme contribute to the **principles listed in Art. 4(b) of the ISA² Decision**. According to Article 13 (5) of the Decision, the evaluation of the programme must include an assessment of the contribution of the ISA² actions to the principles mentioned in the Decisions, namely: subsidiarity and

proportionality; user-centricity; inclusion and accessibility; preventing digital divide in the delivery of public services; security and respect for privacy and data protection; multilingualism; administrative simplification and modernisation; transparency; preservation of information; openness; re-usability and avoidance of duplication; technological neutrality, future-proof solutions, and adaptability; effectiveness and efficiency. Examples of ISA² actions contributing to the principles include:

- To ensure **transparency**, the ISA² programme has taken several measures: i) the rolling work programme provides an overview of the objectives of the actions, the planned and developed solutions, the expected impacts, and the budget allocated to each action; ii) the ISA² Dashboard provides quarterly updates regarding the efficiency and effectiveness of actions in terms of costs, earned value management, effectiveness indicators and targets; iii) information on the level of take-up of solutions is made available via the ISA² webpage dedicated to solutions; and iv) the solutions developed can be accessed via the Joinup platform.
- Concerning **reusability and avoiding duplications**, the process of submitting proposals for actions played an important part throughout the programme. As part of the proposal process for actions to be included in the rolling work programme, the descriptions of proposed actions specify (i) the extent to which the action re-uses other readily available solutions and (ii) the re-usability of the action outputs.

Further details on all principles listed in Art. 4(b) of the ISA² Decision can be consulted in Annex G.6.

6 Efficiency

Key findings

Evaluation question 4: To what extent has the programme been cost-effective? How is the programme performing relative to the planned work and budget?

- The **work across ISA² packages has progressed within time and budget.** Final work is being undertaken in 2021 to bring the activities of the programme to an end and facilitate the transition to the Digital Europe Programme.
- Given the diversity of ISA² actions and types of outputs, a full-scale analysis and comparison of the cost-effectiveness of ISA² actions and solutions is difficult to carry out. **One possible avenue for assessing the costs per output is by focusing on packages that use the same performance indicators** to measure the effectiveness of sampled actions and solutions. In this case and taking into consideration the wide base of end-users (i.e., citizens and businesses), the costs are estimated as low and thus the benefits are greater than the costs for the ultimate beneficiaries of the solutions developed.
- To improve the assessment of cost-effectiveness, future programmes could consider on developing common **metrics to measure the performance of interoperability solutions.**

Evaluation question 5: Which aspects of the programme are the most efficient or inefficient, especially in terms of resources mobilised?

- In terms of efficient aspects of the programme implementation, the **annual process of selection of actions to be included in the Rolling Work Programme** was relatively fit for purpose and efficient with respect to the time invested in preparing proposals. The costs of preparing and submitting proposals as part of the selection process were very small relative to the average budget of an ISA² action. On average, the updating of an existing proposal to be submitted for the Rolling Work Programmes took between two to six person-days. By contrast, developing a new proposal took between 10 to 30 working days. The associated **costs, however, are relatively small compared to the average budget allocated to an ISA² action** throughout the duration of the programme. Considering the preparation of a new proposal at the beginning of the programme and its updating for every annual iteration of the Rolling Work Programme, the administrative costs of preparing and updating the proposal over five years would amount to only 0.5% of the total average budget allocated to accepted proposals.
- In terms of less efficient aspects, the **template used to describe ISA² actions** could be further improved to reduce the level of granularity and to provide more flexibility and ease in modifying the planned activities.
- Finally, **one of the positive aspects was that Member States could submit proposals, alongside European Commission services.** Nevertheless, only a limited number of proposals were received from the Member States, therefore future initiatives could also consider additional avenues for engaging Member States in a co-creative process.

6.1 Introduction

Building on the assessment of the benefits brought by ISA² throughout its existence (see the previous Chapter 5), in the evaluation process it is important to discuss the benefits against the costs incurred in the implementation of the programme. The analysis laid out in this chapter thus looks at the efficiency of the programme in terms of the costs borne by various stakeholders to achieve the objectives/benefits discussed under the

effectiveness criterion. In particular, this chapter provides evidence to assess the following **evaluation questions**:

- To what extent has the programme been cost-effective?
 - How is the programme performing relative to the planned work and budget?
- Which aspects of the programme are the most efficient or inefficient, especially in terms of resources mobilised?

More in detail, there are particular aspects to be assessed to understand how efficient the programme has been. In answering the evaluation questions, the following **judgment criteria** are referred to:

- Efficiency of the implementation of the programme based on the earned value management analysis;
- Cost-effectiveness based on the ratio between the allocated funds and the actual results of the programme;
- Efficiency of the selection process of the actions to be included in the Rolling Work Programme.

6.2 Analysis

Earned value management

Throughout the duration of the ISA² programme, its efficiency has been tracked using the **Earned Value Management (EVM) methodology**. In this context, calculation of the EVM helps in monitoring the work progress compared to planning, taking into account the costs, time needed, and scope of the ISA² actions.

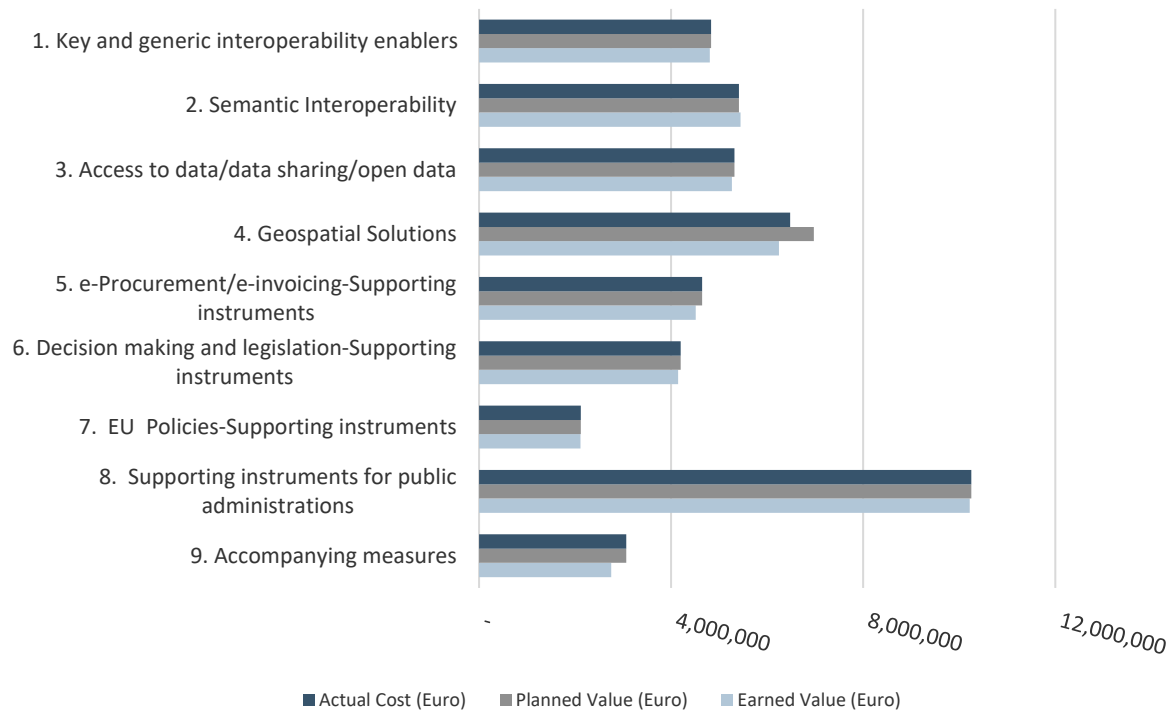
Based on data available on the ISA² Dashboard, which covers the timeframe between June 2016 and October 2020 (the latest available data point at the time of data collection), the progress made in implementing the programme between 2016 and 2020 can be analysed. The **key indicators for this analysis** are the following:

- **Earned value**, namely the value of actual progress made compared to the budget;
- **Planned value**, i.e. the benchmark against which the value of the actual progress is measured in terms of time and costs; and
- **Actual cost**, representing the budget spent.

In the analysis that follows, the data collected from the ISA² Dashboard for each of the 21 sampled actions were aggregated at the package level to provide a comparative view of how the planned work for each work package progressed throughout the duration of the programme.

Figure 17 provides an overview of the main indicators for the third quarter of 2020. The earned value is nearly equal to the planned value for all sampled actions, showing that **the work has progressed as expected. Final activities are being undertaken during 2021 to finalise the activities of the programme and transition to the Digital Europe Programme.**

Figure 17 Earned Value, Actual Costs and Planned Value of sampled actions, by package (Q4 2020)

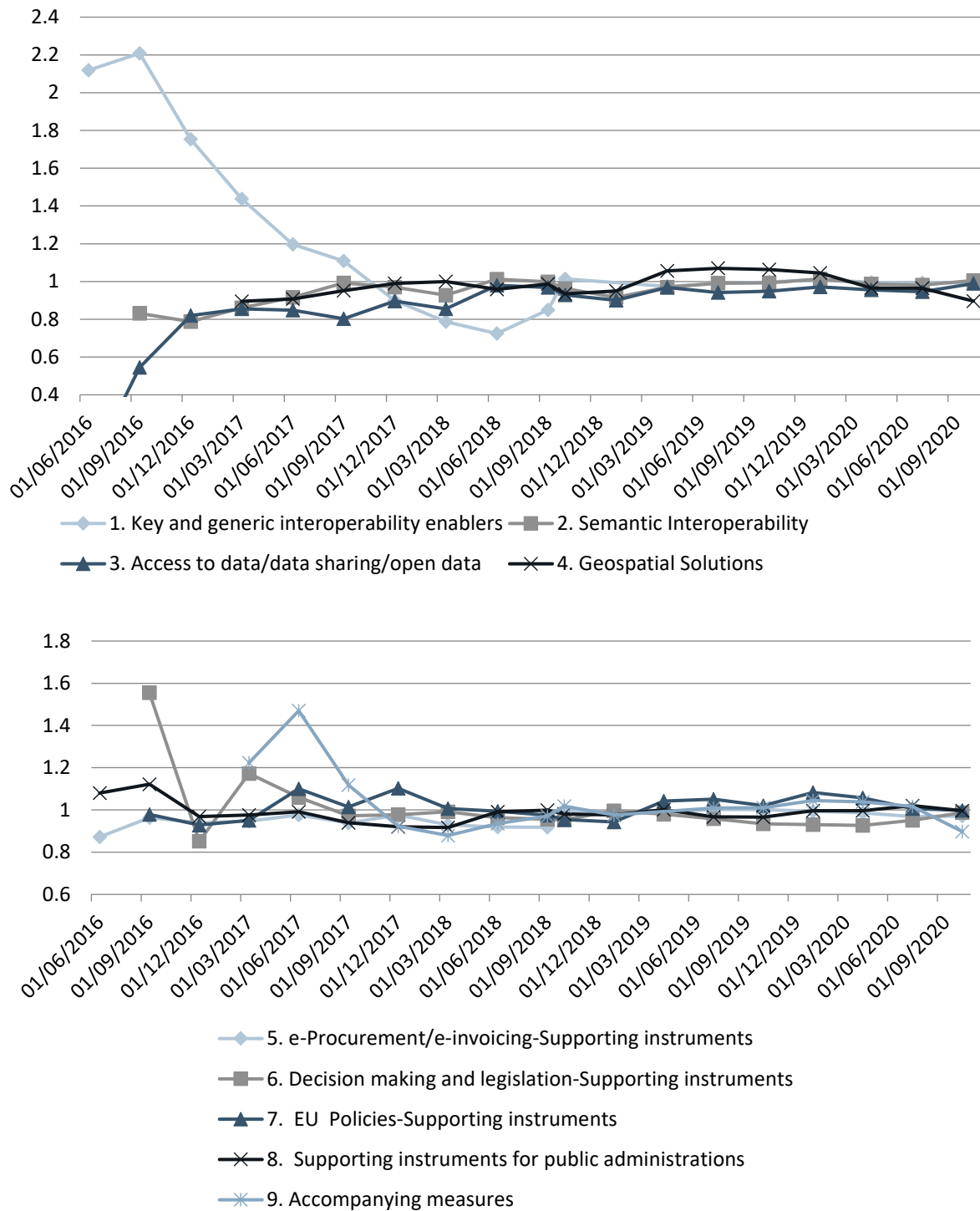


Source: Authors' elaboration on information from the ISA² Dashboard for the sample of 21 actions selected for this evaluation, grouped in their respective packages.

To track how the implementation of the programme has evolved over its lifetime, computing the **Schedule Performance Index (SPI)**, which represents the ratio of earned value to planned value, provides further insights (Figure 18). An SPI value higher than one indicates that a given ISA² package is ahead of schedule, while an SPI value below one suggests that the analysed package is behind schedule. From the start of the programme in 2016 until the fourth quarter of 2020, the SPIs of the sampled actions grouped by packages have shown fluctuations but have been converging on one. In Q4 2020, the computed indices for most packages were almost equal to one.

The more striking fluctuations, as in the cases of the "1.Key and generic interoperability enablers" and "6.Decision making and legislation – Supporting instruments" packages, during the first two years of the programme can be explained by the fact that some of the actions rolled out under ISA² are continuations of actions from the previous edition of the programme. The 'continuity' factor can play an important role in the implementation of actions and contribute in the beginning to faster progress than expected. Given that some actions were started later on in the programme, as is the case of the "4.Geospatial solutions" package, data for the EVM analysis are not always available from Q2 of 2016, but only from a later point in time.

Figure 18 Schedule Performance Indices of the sampled actions grouped by packages

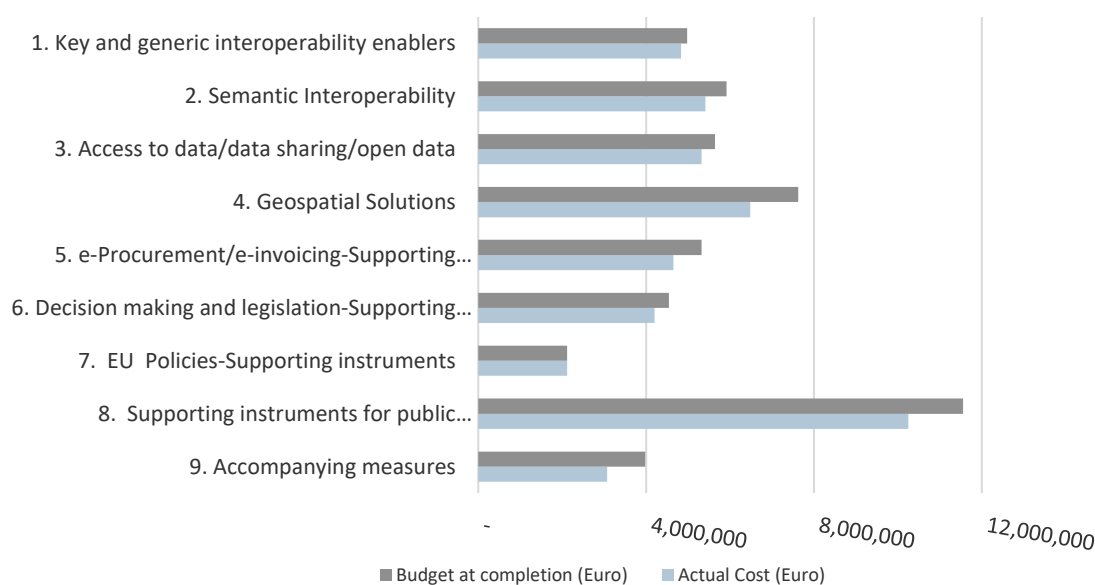


Source: Authors' elaboration on information from ISA² Dashboard for the sample of 21 actions selected for this evaluation, grouped in their respective packages.

Cost-effectiveness

The ISA² Dashboard provides an overview of the **budget at completion for the ISA² actions**⁵¹ as well as the **actual costs incurred for implementing the actions**. Figure 19 presents the breakdown of the budget at completion compared to the actual costs for the sample of actions grouped by their respective packages for the period 2016 – 2020 (the latest data point available being October 2020). The actual costs of the packages shown tend to be close to their foreseen budgets. The average budget for an ISA² action between 2016 and 2020 was of € 2,025,193⁵².

Figure 19 Budget at completion and actual costs of the sampled actions grouped by packages



Source: Authors' elaboration on information from ISA² Dashboard.

The assessment of the cost-effectiveness of the programme relies on the analysis of the costs per output. However, the application of this method in the case of the ISA² programme has an important limitation. Given the diversity of ISA² actions and types of outputs, a full-scale analysis and comparison of the cost-effectiveness of ISA² actions and solutions is difficult to carry out.

One possible avenue for assessing the costs per output is by focusing on packages that use the same performance indicators to measure the effectiveness of sampled actions and solutions. In this regard, the sampled actions in two packages rely on the same indicator, namely the number of public administrations using the solutions that were developed: the "5. e-Procurement/e-invoicing-Supporting instruments" and "1. Key and generic interoperability enablers" packages. By taking the actual costs of the sampled actions in the two packages and the total number of public administrations using the solutions of the packages (the full overview of performance indicators can be consulted in Annex G.2), the **average actual cost per public administration using the solutions** can be calculated (see Table 6). The average costs per public administration are estimated at €33,917 for the "e-Procurement/e-invoicing-Supporting instruments" package and €23,470 for the "Key and generic interoperability enablers" package.

⁵¹ The Budget At Completion (BAC) is the sum of all undergoing and completed specific contracts financed by the ISA² budget allocated to ISA² actions. The analysis is based on the data available on the ISA² Dashboard: <https://ec.europa.eu/isa2/dashboard/programme/efficiency>.

⁵² Based on the data available on the ISA² Dashboard. Last retrieved on 19 April 2021.

This analysis, however, does not capture the effectiveness of the actions in terms of end-users. **The services of public administrations are used by thousands of citizens and businesses**, meaning that **ultimately the costs are much lower relative to the number of end-users**, and thus the benefits greater than the costs.⁵³

Building on the key conclusions of the Interim Evaluation of the programme⁵⁴, future programmes should focus on **developing common metrics to measure the performance of interoperability solutions**. This in turn would allow gaining a more comprehensive picture of cost-effectiveness, permitting comparisons and providing a better understanding of the efficiency of the activities undertaken (see also the key findings of Chapter 5, discussing the need to develop metrics to quantify and qualify the impacts of interoperability solutions).

Table 6 Costs per user (public administrations) for ISA² solutions

Package	Actual costs of sampled actions in the package (€)	Number of public administrations using the solutions of the package	Average actual cost (€)
e-Procurement/e-invoicing-Supporting instruments	4,646,617	170	27,333
Key and generic interoperability enablers	4,975,794	212	23,470

Note: The calculations are based on the sampled actions of the indicated ISA² packages over the period 2016 - 2020. The total number of public administrations using the solutions of the "Key and generic interoperability enablers" package consists of approximately 200 public administrations using "e-TrustEx" and 12 public administrations using "Core Public Service Vocabulary Application Profile (CPSV-AP)". The total number of public administrations using the solutions of the "eProcurement / eInvoicing - Supporting instruments" package includes 70 public administrations using Open e-Prior, roughly 75 solutions either using the ESPD data model or the open source version of the ESPD service developed under ISA², and 25 connections from Member State solutions to eCertis. The full overview of the number of users and other performance indicators is presented in Annex G.2. The overview of costs per package is presented in Figure 19.

Source: Authors' elaboration on the Interim Evaluation, data collected via desk research and additional input received from the action owners.

Efficiency of the selection process of actions

The **annual process of selection of actions to be included in the Rolling Work Programme** was a central part of the functioning of ISA², with the last iteration ending with the 2020 Rolling Work Programme. The preparation and submission of a proposal to be included in the ISA² Rolling Work Programme required the applicant to perform several activities such as: i) finding out about the call for proposals; ii) studying the documents of the call for proposals and understanding the rules and procedures; iii) preparing a concise description of the proposed action in compliance with the "work programme entry template"; iv) collecting the required internal authorisations to submit the proposal; and v) submitting the proposal by e-mail.

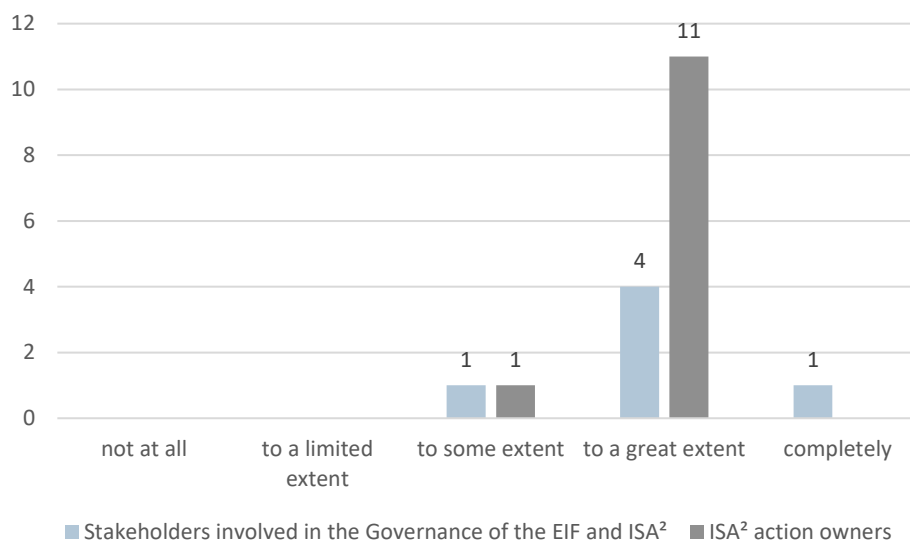
Figure 20 shows that consulted action owners and stakeholders involved in the governance of the programme consider the programme was to a great extent fit for purpose (the

⁵³ For instance, in the case of the "e-Procurement/e-invoicing-Supporting instruments" package, the eCertis solution recorded 3000 unique visitors (June 2021) from a wide range of users, the ESPD solutions was downloaded over 35,000 times, and the Open e-Prior solutions counts over 300 suppliers connected via the portals. When taking into account the wide base of users, beyond public administrations themselves, the costs per end user are estimated to be much lower. Similarly, for the "Key and generic interoperability enablers", approximately 16.7 million documents have been exchanged between connected EU institutions, as well as public and private entities in the Member States using the e-TrustEx solution, and the CPSV-AP solution has been downloaded over 700 times from Joinup (Annex G.2).

⁵⁴ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

assessment is based on the responses received from 12 action owners and six stakeholders involved in the governance of the programme). **Respondents emphasised that one of the positive aspects was that Member States could submit proposals, alongside European Commission services.** Nevertheless, only a limited number of proposals were received from the Member States.

Figure 20 Extent to which the selection process of the actions is fit-for-purpose (number of respondents by stakeholder category)



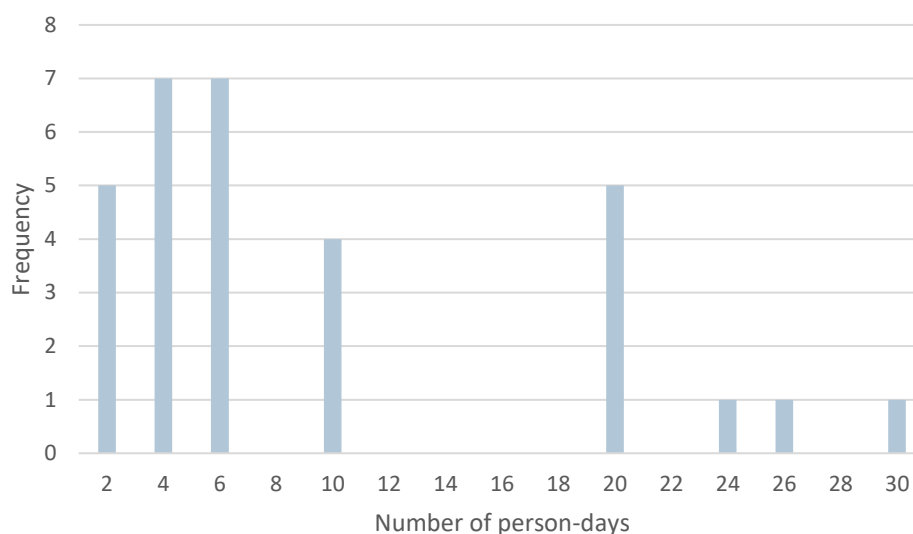
Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 18.

In addition, twelve respondents (action owners and stakeholders involved in the governance of the programme) provided further details based on their experience in having submitted proposals and the proposals having been accepted and included in the Rolling Work Programmes of ISA². The time spent on preparing the proposals varied from two to three person-days up to 25 person-days to complete the proposal (see Figure 21). The differences in the reported time required to prepare a proposal reflect the types of actions put forward such as new actions or previous actions for which one can rely on previously accumulated experience. Further information from the Interim Evaluation of ISA² shows that the amount of time spent on preparing a new proposal – instead of updating an existing one – can be up to 30 person-days⁵⁵. This suggests that a greater effort may be expected at the beginning of the programme, as applicants get acquainted with the requirements of the selection process and draft initial proposals for actions. The subsequent applications would focus mainly on updating previously accepted proposals, reducing the time required.

⁵⁵ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

Figure 21 Number of person-days required for preparing a proposal for an ISA² action



Note: This chart presents the distribution of person-days needed to prepare an ISA² proposal grouped in intervals of two days to facilitate the overview of data. This chart combines the feedback from action owners and programme governance stakeholders consulted for the final evaluation of the programme as well as the interim evaluation of the programme.

Source: Authors' elaboration on the feedback from consulted ISA² action owners and stakeholders involved in the governance of the programme, together with data reported in the study supporting the Interim Evaluation of ISA² (CEPS, 2019).

To get an overview of the **administrative costs** associated with the preparation of proposals for ISA² actions, the **Standard Cost Model** can be applied. Applying this methodology based on the respective Better Regulation Tool⁵⁶, the estimates of person-days spent preparing proposals for ISA² actions are multiplied by a standard tariff, which in this case is represented by the hourly labour cost in the respective Member States⁵⁷, factoring in an average person-day composed of eight hours. Building on the feedback from consulted stakeholders and the findings of the Interim Evaluation study⁵⁸, the standard cost model analysis in this case can distinguish between the updating of a proposal for an existing action (with an estimated average time spent of up to 6 days) and the preparation of a proposal for a new action, for which the time spent increases significantly, from 10 person-days to 30 person-days.

Against this background, the time spent in the process of preparing proposals for ISA² actions can thus be translated into costs as follows (the underlying data can be consulted in Annex G.12):

- A **renewed proposal** has cost approximately € 1,126;
- A **new proposal** has cost approximately € 5,669.

To put these numbers into context, it is worth noting that the average budget for an ISA² action between 2016 and 2020 was € 2,025,193⁵⁹. The costs incurred in preparing a proposal are thus very small, as illustrated in the following scenario. Let us assume that a proposal for a new action was prepared and included in the 2016 Rolling Work Programme

⁵⁶ European Commission, Better Regulation "Toolbox", 7 July 2017, Tool #60. Available at: https://ec.europa.eu/info/sites/info/files/better-regulation-toolbox_2.pdf. Last accessed: 7 June 2021.

⁵⁷ The data on hourly labour cost were retrieved from Eurostat: Eurostat, Labour cost levels by NACE Rev. 2 activity (based on the available data for 2019), available at: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lc_lci_lev&lang=en

⁵⁸ CEPS (2019) Interim Evaluation.

⁵⁹ Based on the data available on the ISA² Dashboard. Last retrieved on 19 April 2021.

and then updated annually through 2020 (four updates in total). **The total administrative costs throughout the duration of the programme would thus amount to an average of € 10,173, which in relative terms would represent only 0.5% of the average total budget of the action.**

Future programmes seeking to implement a similar process could consider a more streamlined approach to application templates. In the case of ISA², one respondent pointed out that the part of the application form regarding the work programme was complicated. **The templates should be shorter, and the level of granularity should be reduced to provide more flexibility and ease in modifying the planned activities.**

7 Coherence

Key findings

Evaluation question 6: To what extent do the ISA² actions form part of a "holistic" approach within the framework of the programme? (internal coherence)

- **There are synergies between the actions of the programme to some extent** and overlaps remain limited, as confirmed in particular by respondents who own ISA² actions. Nevertheless, there is an important factor that affects the extent to which synergies have been tapped. The fragmentation of the programme into multiple different actions makes it difficult to fully benefit from all synergies. Importantly, this finding is reinforced through the analysis of the effectiveness of ISA² (see Chapter 5). Future initiatives could focus on a smaller set of actions and solutions in order to bring them to maturity, enhance their take-up and ensure that all potential synergies are fully explored.
- Further evidence from desk research completes the picture of internal coherence. Analysing **the links between sampled actions**, there are **multiple instances of re-use and contributions across ISA² actions**. Several actions play a central role, with their solutions and outputs being widely re-used by other actions, such as it is the case for the SEMIC and Joinup actions.

Evaluation question 7: To what extent is the ISA² programme coherent with other EU interventions which have similar objectives and with global initiatives in the same field? (external coherence)

- At the EU level, various programmes, policies and initiatives support the efforts to enhance interoperability and contribute to the modernisation and digitalisation of public administrations across the EU. ISA² was particularly synergetic with the **CEF, the SDG, ERDF, and the eGovernment Action plan**. Overlaps remain relatively limited, but they can appear between ISA² and funding instruments for public sector digitalisation. Future initiatives on interoperability could focus on fully tapping into potential synergies, particularly with funding instruments in the area of digitalising public services.
- Multiple links are observed between **ISA² actions and other relevant EU programmes, policies and initiatives**. The following actions play a particularly nodal role: Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System, e-TrustEx, Catalogue of Services, SEMIC, and Legal Interoperability.
- In the field of **standardisation**, it is worth assessing the coherence between the **Multi-Stakeholder Platform for ICT standardisation** and ISA². Actions could be taken to further strengthen the synergies between the Platform, the achievements of ISA² and the future of interoperability in the EU:
 - Make systematic the link between the different aspects of the work done under ISA² and the Multi-Stakeholder Platform for ICT Standardisation;
 - Increase the awareness in the public sector of the key role of standards in fully supporting the twin green and digital transitions;
 - Promote the implementation of the principle of standards by default and by design to enable interoperability by default and by design.
- Finally, looking at **international initiatives**, ISA² takes an approach that is consistent with recommendations on Digital Government put forward by the OECD. It is worth noting, however, that while the OECD provides guidance and a set of recommendations to help public authorities design the main orientations of their digital government strategies, such an approach does not ensure the development of a harmonised landscape of digital and interoperable public sectors. The ISA² programme went further in this respect by providing concrete interoperable solutions to help harmonise the interoperability in the public sector.

7.1 Introduction

The ISA² programme is part of a wider framework of programmes, policies and initiatives aimed at supporting digitalisation and interoperability in the public sector in the EU. To maximise the benefits for the public sector, it is essential to ensure that synergies between the activities undertaken in the field are tapped and overlaps remain limited, so as not to duplicate efforts. Against this background, the final evaluation of ISA² considers the coherence of the programme, both internally (looking at the degree to which the ISA² programme and interventions supported by such programme have been consistent among each other; the 'internal coherence') and externally (analysing the interplay between ISA² and the EU policy framework at large, in particular regarding EU interventions with similar objectives and global initiatives in the field; 'the external coherence').

The analysis presented throughout this chapter thus provides evidence in support of the following evaluation questions:

- To what extent do the ISA² actions form part of a "holistic" approach within the framework of the programme? (internal coherence)
- To what extent is the ISA² programme coherent with other EU interventions which have similar objectives and with global initiatives in the same field? (external coherence)

In the analysis, the evaluation questions are broken down into the following **judgment criteria**:

- Degree of coherence among actions funded by the ISA² programme (internal coherence).
- Level of re-use of results of a funded action by another action within the ISA² programme (internal coherence).
- Degree of coherence between the programme and other EU-supported programmes and EU policies (external coherence).
- Level of re-use of results delivered by ISA² actions by other EU programmes (external coherence).
- Degree of coherence between the programme and global initiatives in the field (external coherence).

7.2 Analysis

Internal coherence: Degree of coherence among actions funded by the ISA² programme

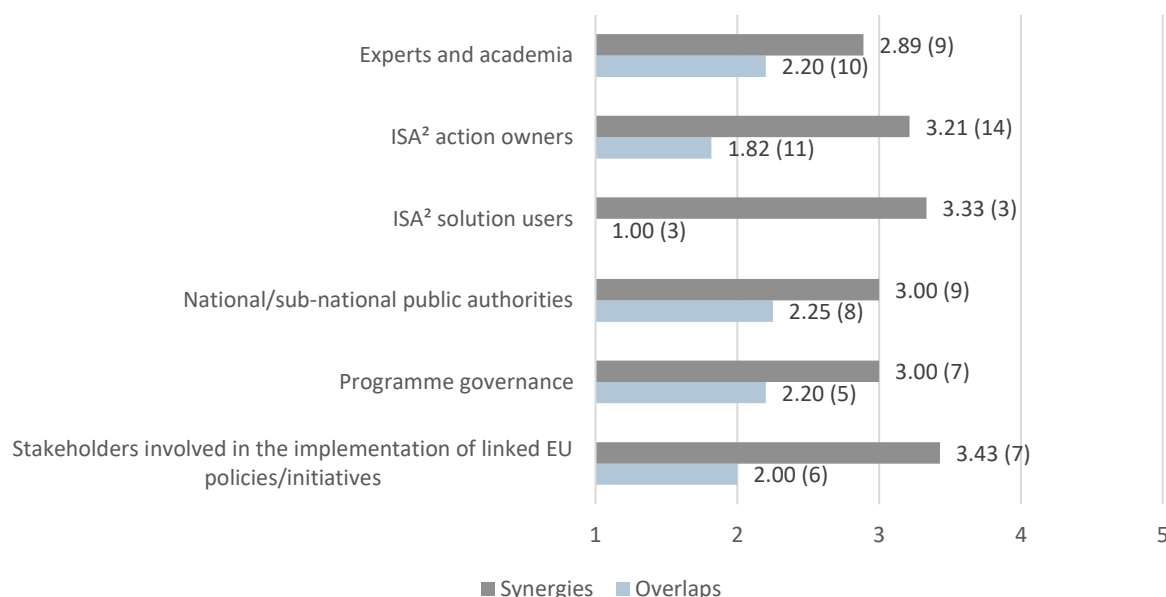
With 54 supported actions across nine work packages and multiple Commission services involved in the implementation of the actions⁶⁰, **coordination and coherence among the multiple activities rolled out was an essential part of the performance of the programme** (internal coherence). To this end, assessing the level of synergies or overlaps between ISA² actions is relevant.

There are synergies between the actions to some extent (Figure 22). This is confirmed in particular by respondents who own ISA² actions, consulted stakeholders who are involved in the implementation of linked EU initiatives, and solution users (with the caveat that only three solution users expressed their views on this matter). Interestingly, consulted stakeholders who are involved in the implementation of linked policies are most likely to see a great extent of synergies between ISA² actions. Yet respondents also

⁶⁰ Besides DG DIGIT, other Commission services and institutions include the JRC, which is involved in the ELISE action, and the Publications Office, which engages in the action "Development of an open data service, support and training package in the area of linked open data, data visualisation and persistent identification". For further details please see: https://ec.europa.eu/isa2/actions_en

emphasised that the fragmentation of the programme into multiple different actions makes it difficult to fully tap into all synergies.

Figure 22 Extent to which synergies and overlaps between ISA² actions exist (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 49 (Synergies) and 43 (Overlaps).

Based on the findings from consulted desk research and the review of desk evidence on ISA² actions and solutions, examples of synergies include:

- As part of the [ELISE](#) action, instances of synergies include the supply of indicators from Location Interoperability Framework Observatory (LIFO) to the [NIFO](#) and the re-use of [DCAT-AP](#), which is developed under the [SEMIC](#) action, for the Geo-DCAT, an extension of DCAT-AP which described geospatial datasets, dataset series and services.
- The [Innovative Public Services](#) action, exploring how new digital technologies can enhance the provision of public services, has synergies with actions including: the [Legal interoperability](#) action (which also experimented with potential applications of new technologies) and the [FISMA: Financial data standardisation](#) action (which explored the use of machine learning for reporting), as well as the [ELISE](#) action (which carried out studies on disruptive technological developments for linked-to-location data).
- The [Interoperability Academy](#) action is fostering re-use by increasing awareness of the solutions developed as part of other ISA² actions.
- The [European public procurement interoperability initiative](#) action re-uses the [Interoperability Test Bed](#) action and the Core Vocabularies developed as part of the [SEMIC action](#), and the [EIRA](#) solution developed as part of the [EIA](#) action.⁶¹
- There are synergies between the actions which deal with semantic and technical specification and the [Interoperability Test Bed](#).

⁶¹ In addition, the first case of EIRA and the Interoperability Test Bed solutions being used for public procurement applications was recorded for the municipality of Valencia, Spain, based on feedback from the action owners.

The assessment of internal coherence of the ISA² programme is complemented by an investigation of potential overlaps. The assessment based on the feedback from consulted stakeholders is positive in this regard: **any overlaps between the ISA² actions are limited** (see Figure 22) and tend to be mostly functional overlaps, which are needed for the cohesive functioning of the programme.

Internal coherence: Level of re-use of results of a funded action by another action within the ISA² programme

Additional evidence from the desk review of information available on the ISA² Dashboard allows gaining an **overview of the network of ISA² actions and the links between them**, i.e. actions being re-used or contributing to other actions. There are multiple instances of re-use and contributions, as shown in Table 7. Several actions play a central role, with their solutions and outputs being widely re-used by other actions, such as is the case for the SEMIC and Joinup actions.

Table 7 Number of links between the sampled actions

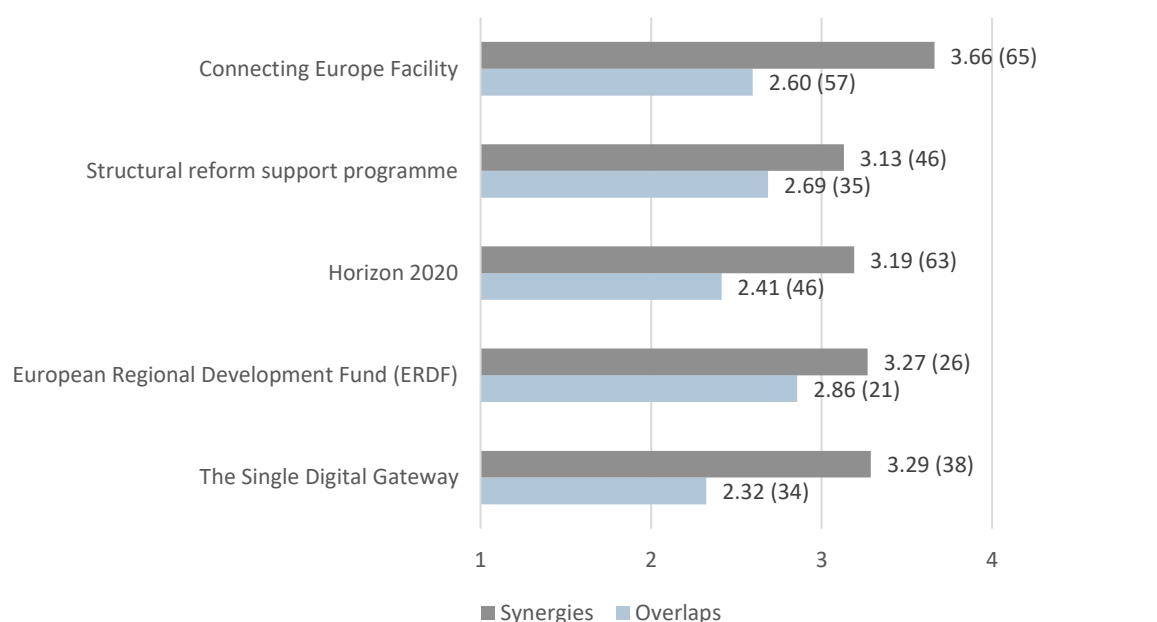
Actions	Number of other ISA ² solutions that are used by the action	Number of other ISA ² actions that use the solutions of the action
1. Key and generic interoperability enablers		
Trusted Exchange Platform (e-TrustEx)	5	9
Catalogue of Services	3	3
2. Semantic Interoperability		
Public Multilingual Knowledge Management Infrastructure for the DSM (PMKI)	2	0
SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	6	23
3. Access to data/data sharing/open data		
Big Data for Public Administrations	6	0
Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System	6	2
Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	2	0
4. Geospatial Solutions		
European Location Interoperability Solutions for e-Government (ELISE)	9	2
5. eProcurement/eInvoicing-Supporting instruments		
European Public Procurement Interoperability Initiative	8	4
6. Decision making and legislation-Supporting instruments		
Legal interoperability	9	0
REFIT Platform	0	3
Inter-Institutional Register of Delegated Acts	1	1
7. EU Policies-Supporting instruments		
European Citizens' Initiatives and European Parliament Elections	3	0
8. Supporting instruments for public administrations		
Joinup - European Collaborative Platform and Catalogue	7	14
NIFO	9	0
EIA	7	9
EUSurvey	2	0
Interoperability Maturity Model	11	4
Standard-Based Archival Data Management, Exchange and Publication	0	1
9. Accompanying measures		
Raising Interoperability Awareness - Communication Activities	1	0

Source: Authors' own elaboration on the ISA² Dashboard and additional feedback provided by the ELISE action owners (at least two other ISA² actions re-use the solutions of ELISE, including Joinup, where three ELISE solutions are published and NIFO which uses outputs of the Location Interoperability Framework Observatory).

External coherence: Degree of coherence between the programme and other EU supported programmes and EU policies

At the EU level, various programmes, policies and initiatives support the efforts towards enhancing interoperability and contribute to the modernisation and digitalisation of public administrations across the EU. The evaluation of how the ISA² programme delivered its results during its period of operation needs to consider the **interrelations between the programme and other relevant EU initiatives rolled out at the same time as ISA²**. The main initiatives to consider are: the **CEF**, the **Structural Reform and Support Programme (SRSP)**, **Horizon 2020**, the **ERDF**, and the **SDG**. This section of the report analyses the synergies and overlaps between ISA² and the aforementioned initiatives based on the stakeholders' view presented on Figure 23.

Figure 23 Extent to which synergies and overlaps between ISA² and other relevant EU programmes exist (average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).
 Source: Authors' elaboration on data collected via targeted and public consultation activities.

Consulted stakeholders noted that **ISA² is particularly synergetic with the CEF, the SDG** (with synergies existing to some extent or to a great extent), **and ERDF**. Indeed, the ISA² programme and the initiatives mentioned are closely linked. CEF, through its [building blocks](#), and ISA², through the solutions developed, both contributed to enhancing the interoperability landscape in the EU. An ISA² action rolled out and completed in 2018 supported the work towards the SDG, namely the [Interoperability requirements for the SDG implementation](#) action. Notably, while a great extent of synergies has been identified between ISA² and the ERDF, programme governance and ISA² action owners also pointed out that there are overlaps at least to some extent between the two programs that could create duplications. Future initiatives in the area of interoperability could focus on fully tapping into potential synergies and limiting overlaps particularly with initiatives designed to provide funding in the area of digitalising public services. Although generally expected

to be more limited, synergies between ISA² and the SRSP⁶² arose from the complementarities between the two initiatives: ISA² has developed interoperable digital solutions that are free for use and SRSP generally supports the process of modernisation and digitalisation of public administrations in the Member States through tailored support for reforms. ISA² and SRSP are also seen as overlapping to a limited extent compared with other programmes.

Respondents also pointed **to synergies between ISA² and the corporate IT governance of the Commission** (which contributes to the internal coordination in the Commission on the use and re-use of IT solutions, including ISA² solutions) and **the INSPIRE Directive** (with the ELISE action promoting the re-use of harmonised geospatial data under the INSPIRE Directive). With regard to recent policy developments, there are **strong synergies between ISA² and both the [European Digital Strategy](#) and the [European Data Strategy](#)**. Interoperability is a key element in effective open data re-use and in the success of the proposed European data spaces.

The ISA² programme also contributed to several actions listed in the [eGovernment Action Plan](#) for the period from 2016 to 2020. In particular, the following ISA² activities are relevant with respect to the specific scope of the eGovernment Action Plan:⁶³

- Through the activities undertaken as part of the [European public procurement interoperability initiative](#) action, ISA² supported the actions #1, #5, and #6 of the eGovernment Action Plan focusing on the development of eProcurement;
- Through its support for the implementation and monitoring of the EIF, the ISA² programme also contributed to actions #4 and #6 of the eGovernment Action Plan calling for support for the take-up of the new EIF;
- The role played by the "ELISE" action in implementing the INSPIRE Directive also fed into action #19 of the eGovernment Action Plan on the deployment and take-up of the INSPIRE Directive data infrastructure.

In addition, it is important to discuss the role played by standardisation in the field of interoperability. In this context, it is worth assessing the coherence between the [Multi-Stakeholder Platform for ICT standardisation](#) and ISA² to draw lessons for the future. The Platform brings together experts acting as an advisory group for the Commission on matters related to the implementation of ICT standardisation policies. Among their duties, the group members support the Commission in preparing the annual rolling plan for ICT standardisation which serves to outline those key EU policy areas for which ICT standards and specifications are necessary for the successful implementation of the policies. The 2021 rolling plan covers 37 domains of interest. With regard to the work conducted under ISA², the rolling plan puts the emphasis on further developing existing specifications and enhancing their take-up, for instance with regard to the Core Vocabularies and CPSV-AP, turning specifications into internationally accepted standards, such as is the case with the DCAT-AP specifications⁶⁴, and building on the existing work done in the field of e-Procurement solutions as part of ISA²⁶⁵. Actions could be taken to further strengthen the

⁶² The SRSP was active between 2017 and 2020, having been replaced by the Technical Support Instrument (TSI) for the period 2021 to 2027. For further details please see: https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/technical-support-instrument-tsi_en

⁶³ COM (2016) 0179 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU eGovernment Action Plan 2016-2020 Accelerating the digital transformation of government, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016DC0179>

⁶⁴ See the thematic group on "Big Data, Open Data and Public Sector Information" of the 2021 rolling plan on ICT standardisation, available at: <https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/big-data-open-data-and-public-sector-information>.

⁶⁵ See the thematic group on "e-Procurement, Pre- and Post-award" as part of the 2021 rolling plan on ICT standardisation, available at: <https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/e-procurement-pre-and-post-award-0>

synergies between the Platform, the achievements of ISA² and the future of interoperability in the EU:

- Improve and make systematic the link between the components of the Digital Europe Programme (which will carry forward different aspects of the work done in the past under ISA²) and the Multi-Stakeholder Platform for ICT Standardisation. This action would help ensure that the rolling plans for ICT standardisation clearly reflect with concrete actions all the requirements of public sector interoperability and that the achievements of ISA² and expected follow-up initiatives fully benefit from the outcome of standardisation.
- Increase the awareness in the public sector on the key role of standards in the digital transformation strategy and in fully supporting the twin green and digital transitions, engaging national standards organisations and national trade associations.

External coherence: Level of re-use of results delivered by ISA² actions by other EU programmes

Desk research based on the information available on the ISA² Dashboard provides further evidence for the assessment of the external coherence of ISA². In this regard, **the number of links between ISA² actions and other EU programmes, policies and/or initiatives can be analysed.** Table 8 shows an overview of the number of EU programmes, policies and/or initiatives that each of the sampled actions rely on as well as the number of other EU programmes, policies and/or initiatives that use the solutions provided by the sampled actions. Multiple links are observed for the following actions: [Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System](#), [e-TrustEx](#), [Catalogue of Services](#), [SEMIC](#), and [Legal interoperability](#).

Table 8 Number of links between the sampled actions and other EU programmes/policies/initiatives

Actions	Number of other EU programmes / policies / initiatives that the action relies on	Number of other EU programmes / policies / initiatives that use the solution(s) provided by the action
1. Key and generic interoperability enablers		
Trusted Exchange Platform (e-TrustEx)	4	1
Catalogue of Services	3	2
2. Semantic Interoperability		
Public Multilingual Knowledge Management Infrastructure for the DSM (PMKI)	1	1
SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	6	2
3. Access to data/data sharing/open data		
Big Data for Public Administrations	0	2
Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System	9	1
Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	3	1
4. Geospatial Solutions		
European Location Interoperability Solutions for e-Government (ELISE)	3	4
5. eProcurement/e-invoicing-Supporting instruments		
European Public Procurement Interoperability Initiative	7	0
6. Decision making and legislation-Supporting instruments		
Legal interoperability	3	2
REFIT Platform	0	1
Inter-Institutional Register of Delegated Acts	0	1
7. EU Policies-Supporting instruments		

Actions	Number of other EU programmes / policies / initiatives that the action relies on	Number of other EU programmes / policies / initiatives that use the solution(s) provided by the action
European Citizens' Initiatives and European Parliament Elections	2	0
8. Supporting instruments for public administrations		
Joinup - European Collaborative Platform and Catalogue	1	0
NIFO	0	1
EIA	3	1
EUSurvey	1	0
Interoperability Maturity Model	0	1
Standard-Based Archival Data Management, Exchange and Publication	0	3
9. Accompanying measures		
Raising Interoperability Awareness - Communication Activities	1	1

Source: Authors' own elaboration on information from the ISA² Dashboard and additional feedback provided by the ELISE action owners (at least four instances of other EU initiatives that use the solutions of ELISE can be identified: the INSPIRE Reference Validatoris used in the implementation of the INSPIRE Directive; the outputs of the ELISE activities on "energy and location" are used for the roll out of the Energy Performance and Buildings Directive (EPBD) and the Energy Efficiency Directive (EED); harmonised open address data processed by the ELISE gazetteer evaluation are used by ESTAT).

External coherence: Degree of coherence between the programme and global initiatives in the field

Finally, public sector interoperability is an issue that is brought up in international fora as well. At the international level, the [OECD on Digital Government](#) lends itself to a comparison with the activities undertaken under ISA² and the EIF. The work of the OECD is divided into six key areas:

- Open Government Data
- Recommendation on Digital Government
- Digital Government Toolkit
- E-Leaders Meeting
- Open Data & Anti-corruption
- Social Media Use by Governments

In particular, the "[Recommendation on Digital Government](#)", adopted in 2014 and comprising high-level recommendations, and the "[Digital Government Toolkit](#)" are relevant, with the toolkit providing support for the implementation of the high-level recommendations. The OECD approach is similar to the EIF and ISA² in the sense that a strategic framework is established through the high-level recommendations of the OECD, while the EIF serves as the strategic framework for the specific EU approach in the field. To complement the recommendations, the OECD brings in a more practical component through the "Digital Government Toolkit". In the EU, the practical aspect is represented by ISA². The [OECD recommendations](#) and the work done as part of the EIF and ISA² are mutually reinforcing in their messages, particularly when it comes to:

- 'Ensuring greater transparency, openness and inclusiveness of government processes and operations' as part of digital government strategies (Recommendation 1);
- 'Creating a data-driven culture in the public sector' as part of digital government strategies (with a particular focus on access and re-use of data; Recommendation 3);
- 'Ensuring coherent use of digital technologies across policy areas and levels of government' in developing digital government strategies (Recommendation 6).

Yet the approach taken by the OECD is broader and less granular than what the EIF and ISA² set out to achieve. The toolkit provides an overview of principles, best practices related to the principles, and a self-assessment of the stages of development in digital government. The approach to the toolkit is again not as granular as the tools and solutions provided by ISA² in support of the implementation of the EIF. Overall, while the OECD provides guidance and a set of recommendations to help public authorities design the main directions of their digital government strategies, such an approach does not guarantee a harmonised landscape of digital and interoperable public sectors. The approach taken through ISA² brings added value through more concrete interoperable solutions that support enhanced cross-border interoperability (see Chapter 8 for a discussion of the EU added value of the programme).

8 EU added value

Key findings

Evaluation question 8: What is the additional value resulting from the ISA² programme, compared to what could reasonably have been expected from Member States acting at national, regional and/or local levels?

- ISA² provided **clear EU added value**, as national or sub-national initiatives alone would have made only limited contributions towards most of the objectives.
- ISA² achieved its objectives at a **lower cost** than that of national or sub-national interventions.
- The EU added value of the programme resides in its support to cross-border interoperability. **Instances of re-use of ISA² solutions by public administrations in the Member States contribute to enhancing cross-border interoperability.** However, the extent of take-up remains an issue to be carefully considered in the future. **The Digital Europe Programme together with connected initiatives for interoperability should build on the achievements of ISA², contribute to bringing solutions to maturity and promote their take-up.**
- As the **main implementing instrument of the EIF and the IAP**, ISA² actions contributed to different areas of EIF implementation. The contribution of ISA² actions to the EIF was taken into account already in the design stage of the actions, by building solutions based on specific principles, models, and / or recommendations of the EIF. ISA² actions also contributed by providing overarching support for monitoring the implementation of the EIF.
- There is a clear direct relationship between several ISA² actions and the actions listed in the IAP, while other ISA² actions provide broader contributions across several areas of the IAP. The close link between ISA² and the IAP is illustrated by six sampled actions with a clear and direct relationship to specific actions of the IAP: [Catalogue of services](#), [EIA](#), [Joinup](#), [Legal interoperability](#), [NIFO](#), [Raising Interoperability Awareness – Communication activities](#). Moreover, the remaining sampled ISA² actions also bring partial contributions across the objectives of the IAP. In line with the analysis in Chapter 5 on the effectiveness of ISA², a particular action of the IAP could be pursued further, as the results of ISA² do not fully address the objective: the Digital Europe Programme or connected initiatives could continue to explore different avenues to contribute to Action 20 of the IAP (“Develop, maintain and use mechanisms and tools assessing the maturity, costs and benefits of interoperability”).

8.1 Introduction

In evaluating an EU-level programme, a natural question that must be answered in the process is why an EU-level intervention is preferred and brings more value compared to what could be expected from independent initiatives taken by the Member States. To answer this question, a counterfactual logic is applied (what would happen in the absence of an EU-level intervention?). This Chapter thus lays out the additional impacts generated by the ISA² programme at the EU level, as opposed to leaving the subject matter in the hands of Member States (including regional or local entities where relevant). The analysis supports the following **evaluation question**:

- What is the additional value resulting from the ISA² programme, compared to what could reasonably have been expected from Member States acting at national, regional and/or local levels?

Throughout the Chapter, the evaluation question is broken down into the following **judgment criteria**:

- Achievement of objectives that could not be otherwise attained with national or sub-national interventions;
- Achievement of objectives at a cost lower than what could be attained via national or sub-national interventions;
- Achievement in terms of cross-border interoperability;
- Contribution to the advancement of common EU policies.

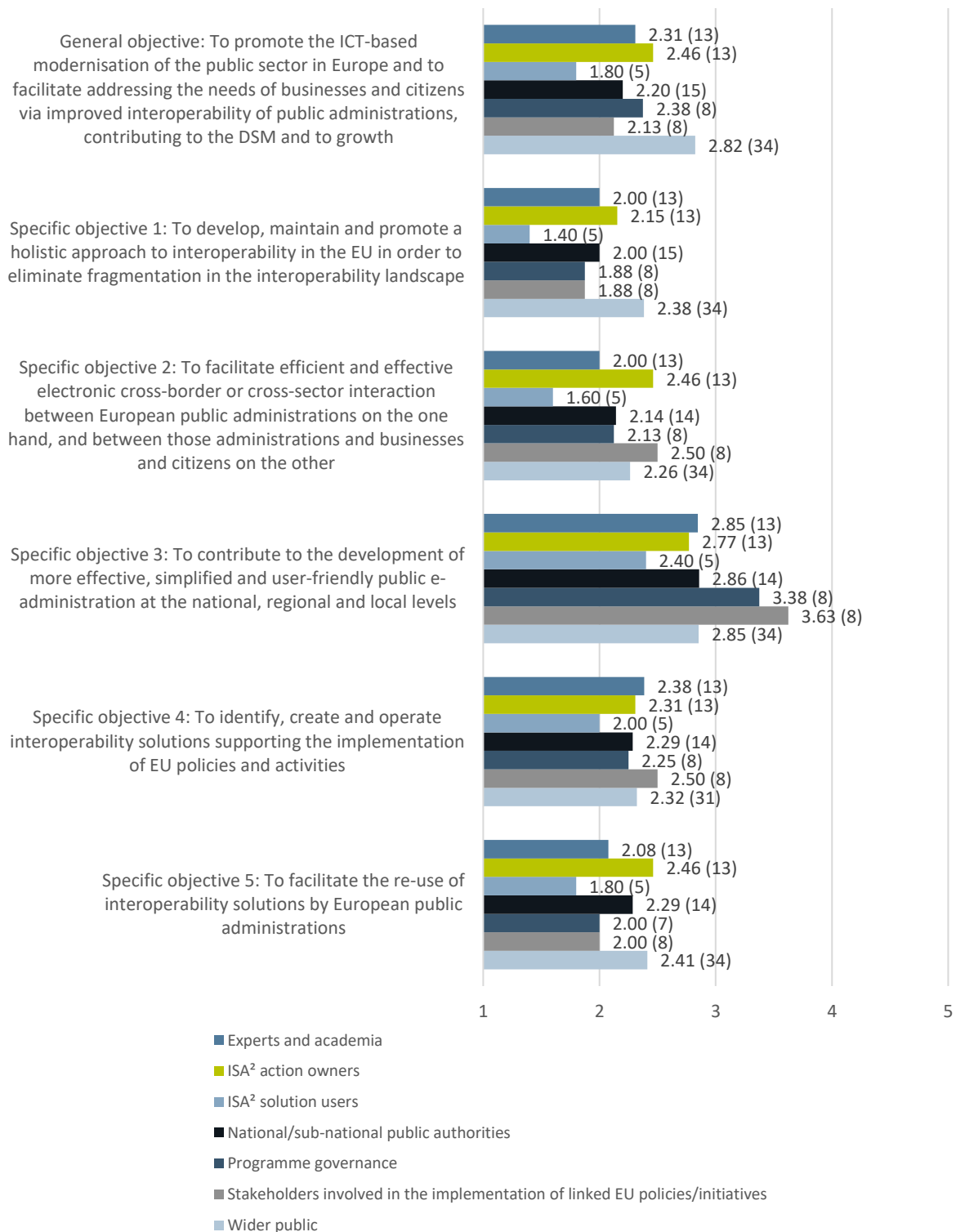
8.2 Analysis

Achievement of objectives that could not be otherwise attained with national or sub-national interventions

To assess the EU added value of ISA², it is important to understand to what extent national or sub-national interventions, in the absence of an EU-wide programme, would be able to achieve the objectives that ISA² set out to achieve. In this regard, **the majority of respondents confirm that national or sub-national initiatives alone would have brought only limited contributions toward most of the objectives** (see Figure 24). Importantly, consulted solution users, national and sub-national public administrations and stakeholders responsible for the programme governance themselves consider that initiatives taken at the Member State level as opposed to the EU level would have only brought limited achievements and thus an EU-level approach is better suited to address the challenges related to the interoperability of public administrations and services. Notably, solution users suggest that national or sub-national interventions alone (in the absence of the ISA² programme) wouldn't have achieved the identified objectives (with an average score across the objectives of 1.83 out of 5). However, only five answers were received from this stakeholder group.

The only exception is "Specific objective 3: To contribute to the development of more effective, simplified and user-friendly public e-administration at the national, regional and local levels". As the focus in this case is substantially on the different levels of public administration within Member States, the respondents, particularly stakeholders involved in the implementation of linked EU policies and in the programme governance, pointed out that national or sub-national initiatives would be necessary at least to some extent in order to ensure that the objective is achieved. Apart from specific objective 3, the general and specific objectives of ISA² have had a chiefly EU perspective. Specific objective 3 focuses on administrative simplification for and the effectiveness of public administrations at the national and sub-national levels, where it is expected that measures taken by Member States individually can have relevant impacts. The other specific objectives pursued by ISA² relate to overarching EU themes (including the modernization of the public sector in Europe, common EU approaches to interoperability, cross-border interactions between public administrations, supporting EU policies and facilitating the reuse of solutions across the EU).

Figure 24 Extent to which national or sub-national interventions would be able to achieve the ISA² objectives in the absence of the programme (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

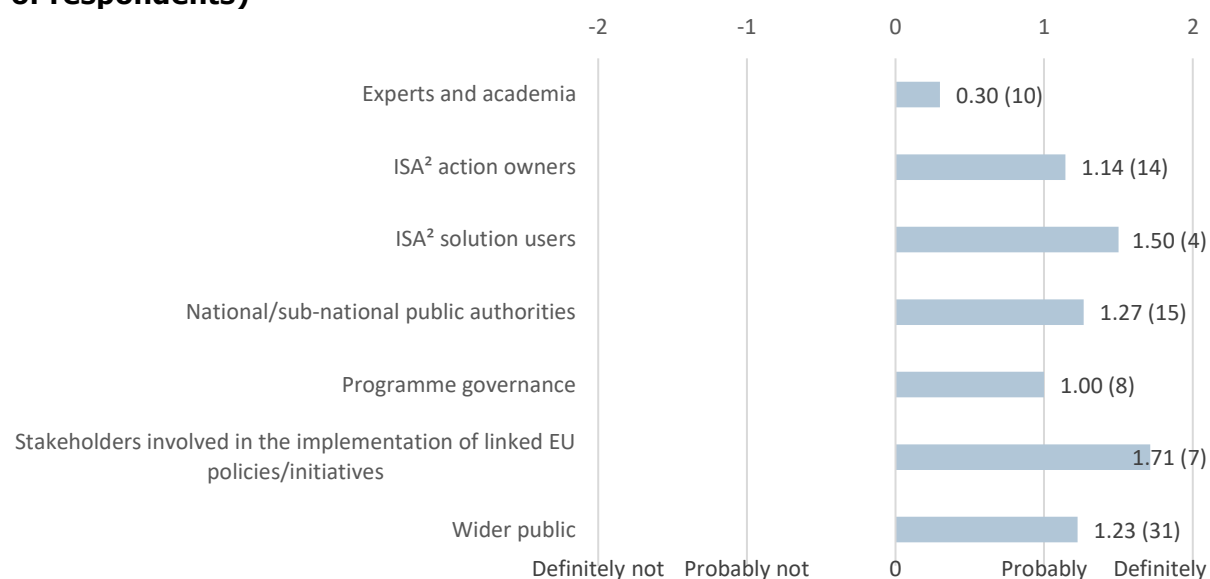
Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents: 96 (General objective), 96 (Specific objective 1), 95 (Specific objective 2), 95 (Specific objective 3), 92 (Specific objective 4), 94 (Specific objective 5).

Achievement of objectives at a cost lower than what could be attained via national or sub-national interventions

The assessment of the EU added value of ISA² can be complemented by an assessment of the potential costs that could arise from pursuing national or sub-national interventions in the absence of an EU-level programme. Respondents across all stakeholder groups confirm that **ISA² can probably achieve its objectives at costs that are lower than the costs of national or sub-national interventions** (see Figure 25). In particular, consulted solution users and stakeholders involved in the implementation of linked EU policies/initiatives consider that the costs are almost definitely lower.

Figure 25 Extent to which an EU-level intervention would be able to achieve the objectives of ISA² at a lower cost than comparable national or sub-national interventions (breakdown by group of stakeholders; average score and number of respondents)



Score: (-2) definitely would not; (-1) probably would not; (1) probably would; (2) definitely would;

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted and public consultation activities. Total number of respondents: 89.

Achievement in terms of cross-border interoperability

The focus of the **ISA² programme is to apply a cross-cutting approach**, aiming to enhance interoperability both across sectors and across borders. The latter aspect is particularly important in understanding to what extent the programme has brought additional EU value by contributing to a more coherent interoperability landscape. In this respect, consulted stakeholders consider that ISA² has contributed to some extent to enhancing cross-border interoperability (see Figure 26). While noting the achievements of the programme, respondents also pointed out two aspects that need to be considered in this analysis. First, the programme is relatively small and is part of a wider landscape of initiatives that are needed to support cross-border interoperability. **Other EU instruments have complemented the programme** (e.g., the [Open Data Directive](#)⁶⁶). Second, **achievements in terms of cross-border interoperability also depend on the take-up of solutions and this aspect depends on the public administrations involved**. The extent to which the programme is able to work closely with public

⁶⁶ Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information.

administrations and promote public administrations' take up of the solutions play an important role.

Figure 26 Extent to which ISA² contributed to enhancing cross-border interoperability in the EU (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 55.

The performance indicators for the sampled actions and solutions as well as the overview of the take-up of solutions by Member States provide additional evidence of the cross-border contributions of ISA². There are **instances of re-use of ISA² solutions by public administrations in the Member States, with some solutions being consistently taken up** (such as Open e-TrustEx, the European Parliament Crypto Tool, and solutions in the area of eProcurement). These instances of re-use contribute to enhancing cross-border interoperability (for further details see Annex G.3). Echoing the results from Chapter 5 on the effectiveness of the programme, **the Digital Europe Programme together with connected initiatives for interoperability should build on the achievements of ISA², contribute to bringing solutions to maturity and promote their take-up.**

One of the key ways in which ISA² contributed to cross-border interoperability was with actions **raising awareness about the importance of interoperability**, actions that, by definition, go beyond borders. In this respect, the communication activities ran as part of the programme ("Raising Interoperability Awareness") and the "Interoperability Academy" action (even if it has only been implemented starting with 2019) are noteworthy. Through its communication activities, ISA² reached varied stakeholders in different Member States. The "Interoperability Academy" complemented the awareness raising efforts by trying to empower stakeholders with more information, help enhance skills and promote the ISA² solutions in order to improve the overall interoperability landscape in the EU (for further details about ISA² actions and cross-border interoperability, see Annex G.11).

Contribution to the advancement of common EU policies

Finally, an examination of the contribution of ISA² to the advancement of common EU policies completes the assessment of its EU added value. Respondents across stakeholder groups generally consider that ISA² contributed to some extent to this aspect (see Figure 27). Importantly, the extent of the contribution depends on the specific EU policies that are considered. For instance, ISA² played a central role in the **advancement of the EIF,**

with specific actions dedicated to supporting and monitoring the implementation of the framework. This Section focuses on the contribution of the ISA² programme to the [new EIF](#) adopted in 2017.

Figure 27 Extent to which ISA² contributed to the advancement of common EU policies (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 55.

The review of evidence on ISA² actions and solutions provides a broader picture of the contribution of the programme to the implementation of the EIF. First, **the contribution of ISA² actions to the EIF was taken into account already in the design stage of the actions**: the template used for submitting new or updated proposals for ISA² actions for the yearly selection included the requirement to explain how the proposed action would contribute to the implementation of the EIF and the IAP⁶⁷. Second, **the contributions of actions range from overarching support for monitoring the implementation of the EIF to specific support to certain principles, models, and / or recommendations**. Noteworthy examples, highlighting the different types of contributions, include the following:

- At the overarching level, the [NIFO action](#) played a central role. The NIFO action has helped implement the commitment stated in the 2017 EIF Communication to create a framework for monitoring the progress in implementing the EIF⁶⁸. This has led to the development of the [EIF Monitoring Mechanism](#) with the first results available for 2019. The Monitoring Mechanism takes stock of the three main components of the EIF and the accompanying 47 recommendations, basing the analysis on 68 KPIs. Beyond the EIF Monitoring Mechanism, NIFO also monitors the developments made across the EU in terms of digital public administrations and interoperability (through the yearly Digital Public Administration factsheets as well as digital policy reports)⁶⁹ and developed the [EIF Toolbox](#) to support public administrations with the implementation of the EIF.

⁶⁷ See, for instance, the 2020 Rolling Work Programme: https://ec.europa.eu/isa2/library/isa%C2%B2-work-programme_en.

⁶⁸ COM(2017) 134 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, European Interoperability Framework - Implementation Strategy, p. 9.

⁶⁹ For an overview of the Digital Public Administration factsheets and the reports published as part of the NIFO action please see: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/digital-policy-hub>.

- When it comes to contributions to specific parts of the EIF, several examples are illustrative of the breadth of topics covered by ISA² actions:
 - The [EIA](#) action helped define the needs and shortcomings related to a common interoperability architecture for European public services and contribute to defining such an architecture as well as map reusable solutions and guidelines services as interoperability building blocks. In this sense, the action particularly contributed to enhancing interoperability governance and specifically to Recommendation 23: “Consult relevant catalogues of standards, specifications and guidelines at national and EU level, in accordance with your NIF and relevant domain-specific interoperability frameworks, when procuring and developing ICT solutions. Standards and specifications can be mapped to the EIRA and catalogued in the European interoperability cartography (EIC).”
 - The [Public Multilingual Knowledge Management Infrastructure for the Digital Single Market](#) action aimed to support EU public administrations in creating services that can be accessible and shareable regardless of the language actually used, as well as allowing SMEs to sell goods and service cross-border in a DSM. The action addressed several recommendations (primarily Recommendation 16 on taking into account multilingualism in the setting up of European public services) and principles of the EIF, in particular those concerning multilingualism, accessibility, administrative simplification, transparency, and reusability of the solutions.

Further details on the contribution of sampled actions to the implementation of the EIF can be consulted in Annex G.8.

In addition, the ISA² programme, through its actions and solutions, actively supported the implementation of the **IAP**, launched in 2017 together with the new EIF (see Box 7 for a detailed discussion of how ISA² actions helped implement the IAP and what areas for improvement remain).

Box 7 Links between ISA² and the EIF Communication

The 2017 Communication on the new EIF defined five focus areas to guide the implementation of the EIF. The IAP annexed to the Communication put forward a list of 22 actions grouped under the five focus areas thus setting strategic priorities until 2020. As one of the main implementing instruments of the EIF and the IAP, ISA² has provided **the operational arm of the strategic framework for public sector interoperability in the EU**. The ISA² actions provide different levels of contributions to IAP: in some cases, there is a clear one-to-one correspondence between ISA² actions and the actions of the IAP; in other cases, ISA² actions make overarching contributions across IAP actions and focus areas.

There are clear direct links between several ISA² actions and the IAP action. Examples include (a full overview is provided in Annex G.8):

- **Legal Interoperability:** The Legal Interoperability action supports policymaking across policy areas, bringing to the forefront the importance of considering potential digital impacts and the role of interoperability when developing new legislation. This ISA² action implements:
 - **Action 3 of the IAP**, by raising awareness on the importance of considering interoperability early on in the legislative process and by developing a methodology for legal interoperability screening;
 - **Actions 19 and 20 of the IAP**, by having put forward guidelines for ICT impact assessment as part of the Better Regulation Toolbox (Tool #27) and guidelines for digital-ready policy proposals.

- **NIFO**: The NIFO action has contributed to **Actions 4 and 5 of the IAP** by monitoring the state of play of interoperability, developing the EIF Monitoring Mechanism and the EIF Toolbox to support the implementation of the EIF⁷⁰.

Beyond the clear links, ISA² actions also have overarching contributions to across the IAP actions. Examples include (see also Annex G.8):

- **Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification**: The action supports open data initiatives by facilitating data re-use and sharing and offering tools to visualise data effectively. The action contributes to several priorities listed in the IAP: organisational interoperability (**Actions 6 and 7**); sharing of good practices (**Action 11**); governance structure (**Action 2**) and key enablers focused on EU open data initiative (**Action 14**).
- **Interoperability Academy**: This action was established in order to help increase awareness of interoperability, the EIF and the solutions developed under ISA². The action facilitates access to information and learning material in this sense. The Interoperability Academy contributes primarily to **Actions 5, 8, 11 of the IAP**.

Based on the analysis of the effectiveness of ISA² (see Chapter 5), a **particular area for improvement** can be identified in how ISA² actions have contributed to the IAP. As noted in Chapter 5, more could be done to assess the impacts and benefits stemming from interoperability. As such, further initiatives for interoperability, as part of the Digital Europe Programme or connected initiatives, could continue to explore different avenues to contribute to **Action 20 of the IAP** ("Develop, maintain and use mechanisms and tools assessing the maturity, costs and benefits of interoperability").

Beyond the EIF, the contribution of ISA² to wider policies such as the **DSM Strategy**⁷¹ is deemed more limited, due to the fact that ISA² is only one of the instruments that are meant to contribute to such overarching policies. The programme's actions have contributed to specific areas of the DSM Strategy from the perspective of interoperability as a key enabler of digitalisation. Importantly, a key action listed in the 2015 Communication on the DSM Strategy under the ambition of "Boosting competitiveness through interoperability and standardisation", namely the revision of the EIF, was achieved under ISA² in 2017, with subsequent monitoring of the implementation of the revised Framework having been ensured through the programme as well (as discussed in the previous section of this Chapter). Further details on how specifically ISA² has contributed to the EIF and the DSM can be consulted in Annex G.7.

⁷⁰ The EIF Monitoring Mechanism, the EIF Toolbox and the reports and factsheet on the digital public administrations and interoperability can be consulted in the NIFO collection on Joinup: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/knowledge-centre>.

⁷¹ COM(2015) 192 final, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions, A Digital Single Market Strategy for Europe.

9 Utility

Key findings

Evaluation question 9: How do the ISA² programme's actions and results, achieved and anticipated, compare with the needs they are supposed to address?

- **ISA² solutions contributed to addressing the main needs and problems experienced by stakeholders.** Based on the results of the continual monitoring process of the programme, **mature solutions such as EUSurvey should be continued** as part of the Digital Europe Programme. In addition, **solutions under development showing potential** could be considered as part of the future strategy for interoperability and as part of the Digital Europe Programme, with a focus on continual development and bringing them to maturity.
- Several recommendations for improving satisfaction with the solutions were suggested by respondents from all stakeholder groups:
 - **Working more closely with the Member States**, through the recently established [Expert Group on Interoperability of European Public Services](#) (2020), supporting co-creation and problem-solving and better leverage synergies with funding instruments (for instance, supporting more engagement of Member States representatives through grants from the Digital Europe Programme).
 - **Better engaging users**, by building upon a broader base of known actual users and co-creating solutions with the private sector (involving public and private actors from the very beginning of the process).
 - **Enhancing synergies with other sources of funding** to make the take-up of solutions developed under the programme more visible and better address the needs of users. Future initiatives could provide funding-based incentives if public administrations contribute to / participate in interoperability advancement in some process⁷².
 - **Setting up an agile process in developing solutions** to allow more flexibility for changes to be made, coupled with a "sandboxing" approach for testing solutions and gathering better feedback.
 - **Promoting successful solutions** as European online services (as has been the case for EUSurvey) to increase awareness.
 - **Continuing communication** activities and ensure that the messages are not too technical in nature.
 - **Concentrating the efforts** on critical priorities to increase user satisfaction, devoting the time to fewer, but more mature tools.

9.1 Introduction

As the ISA² programme provides solutions for a wide variety of users, it is relevant to analyse another criterion, namely the utility of the programme, together with the traditional evaluation criteria based on the Better Regulation Guidelines. The ISA² Decision specifically requires an evaluation of this criterion "where relevant", with a specific focus on "stakeholder satisfaction". The utility criterion measures the extent to which the results generated by ISA² satisfy stakeholders' needs and the levels of satisfaction among different stakeholder groups. As such, the analysis of utility is based chiefly on consultation

⁷² Examples from literature further substantiate this point. See for instance: Leyden (2017), "Innovation in the public sector", and Heichlinger, Bosse (2017), "Promoting Public Sector Innovation: Trends, Evidence and Practices from the EPSA", in: Innovation in the Public Sector. Country experiences and Policy Recommendations, UNECE, Available at: [https://unece.org/DAM/ceci/publications/Innovation in the Public Sector/Public Sector Innovation for web.pdf](https://unece.org/DAM/ceci/publications/Innovation%20in%20the%20Public%20Sector/Public%20Sector%20Innovation%20for%20web.pdf)

activities, given the nature of the criterion. Throughout this chapter, evidence is presented to support the following **evaluation question**:

- How do the ISA² programme's actions and results, achieved and anticipated, compare with the needs they are supposed to address?

The evaluation question can be broken down into the following **judgment criteria**:

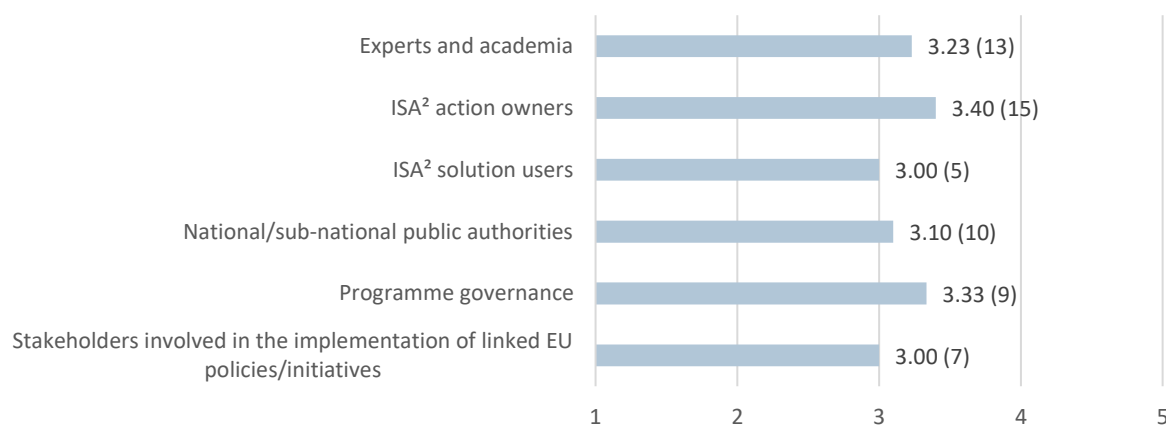
- Degree of alignment between stakeholders' perception of needs and problems at EU, national and sub-national levels and the results of the programme.
- User satisfaction, with a breakdown by stakeholder group.

9.2 Analysis

Alignment of needs and problems and the results of the programme

The assessment of the way in which the ISA² solutions respond to the needs and problems of stakeholders complements the analysis of the relevance of the programme (see Chapter 4) and introduces the additional dimension of the utility of ISA² and its outputs. In this regard, stakeholders generally consider that the ISA² solutions have contributed to some extent to addressing the main needs and problems identified at the time the programme was implemented (see Figure 28)⁷³. In terms of consulted stakeholder groups, ISA² action owners and programme governance respondents consider that ISA² solutions have made a relatively higher contribution to addressing the needs and problems of stakeholders (with average scores of 3.4 and 3.3, respectively, out of 5) compared to consulted solution users and stakeholders involved in the implementation of linked EU policies and/or initiatives and solution users (with average scores of 3 out of 5). The differences between groups are, however, relatively small.

Figure 28 Extent to which ISA² solutions contributed to addressing the needs and problems originally addressed by the programme (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 59.

⁷³ The needs and problems are:

- The need for cooperation among public administrations with the aim to enable more efficient and secure public services;
- The need for exchanging information among public administrations to fulfil legal requirements or political commitments;
- The need for sharing and reusing information among public administrations to increase administrative efficiency and cut red tape for citizens and businesses; and
- The problem of administrative e-barriers leading to a fragmented market.

As mentioned in Chapter 4, as part of the analysis of the relevance criterion, stakeholders responding to the targeted consultations indicated a series of **additional needs and problems in the field of interoperability in the public sector**. In this case, respondents across the stakeholder groups (based on the feedback received to the targeted consultations) take a slightly less positive view (see Figure 29). ISA² solutions have contributed, for example, to addressing the need for digital skills and knowledge about interoperability solutions (through, for instance, the activities rolled out as part of the [Interoperability Academy](#)), and the programme in general has worked towards enhancing coordination, having set up a network of Chief Information Officers (CIOs) from the Member States. However, several respondents (in particular four stakeholders out of the 10 interviewed for this evaluation) recognised that the challenges in the field are quite broad and ISA² and its solutions are only one part of the panorama of relevant measures. Coherence between different initiatives for the digitalisation of public sector is crucial. This particular finding becomes even more important when facing the new or accentuated challenges such as those deriving from the COVID-19 pandemic, including the need for coordination when implementing digital solutions, the need for interoperability in particular fields such as healthcare and mobility and the need to create joint solutions for the effective management of the pandemic.

Figure 29 Extent to which ISA² solutions contributed to addressing and additional needs and problems identified by consulted stakeholders (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

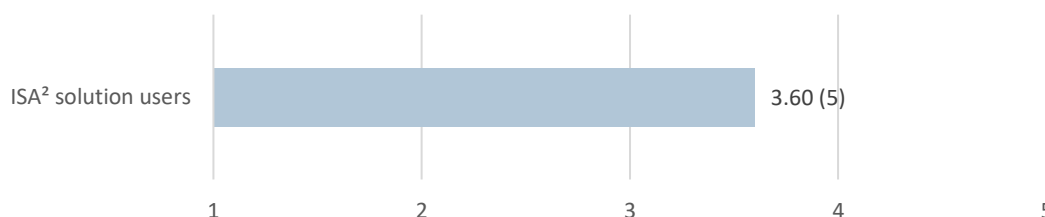
Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 38.

User satisfaction

A very small number of solution users replied to the targeted consultations (five respondents). Their feedback on user satisfaction was generally positive, indicating that they are on average satisfied to more than some extent with the solutions provided by ISA² (see Figure 30).

Figure 30 Extent to which ISA² solutions are meeting users' needs in the fields of cross-border and cross-sectoral interoperability of digital public services (average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities.

These results are complemented by those from an additional consultation that was conducted as part of the continual monitoring of the programme and offered insights into the perceived quality and utility of three ISA² actions and their outputs. Nevertheless, the small number of replies is a limitation. As mentioned in Chapter 3 in the description of the methodology, a significant hurdle has been the ability to reach out directly to solutions users to engage them in the consultation activities. The evaluation process relied on a two-step approach in which action owners were asked to forward to their user base an invitation to participate in the consultation activities, drafted by the Study Team. In addition, a similar limitation was faced by targeted consultations ran as part of the continuous monitoring of the ISA² programme (see Box 8).

Box 8 In focus: perceived quality and utility of selected ISA² actions and their outputs

As part of the continual monitoring of the ISA² programme, a survey was conducted on the **perceived quality and perceived utility** of selected ISA² actions, with feedback being received for the following three selected actions:

- Action 2016.06 "Sharing statistical production and dissemination services and solutions in the European Statistical System";
- Action 2016.25 "Interoperability Test Bed";
- Action 2016.35 "EU Survey".

The survey ran between December 2020 and February 2021 and targeted the users of solutions developed as part of the three actions. The respondents provided their feedback regarding the quality and value of the solutions, the usefulness of the solutions for the respondents' work, and the overall satisfaction with the solutions used. The results are reported in Figure 29, based on the Perceived Quality and Perceived Utility Monitoring Reports for ISA² actions 2016.06 (11 responses), 2016.25 (17 responses), 2016.35 (18 responses), shared with the Study Team by DIGIT.D2. Similar to the evaluation process, the number of answers recorded was relatively small.

Overall, **the majority of consulted users rate positively the quality of the solutions** developed as part of the three actions. They find the solutions useful in their work and are generally satisfied with the solutions. In the case of EUSurvey, these results are almost unanimous. **The fact that EUSurvey is a mature solution which is used widely is reflected in these scores.** The EUSurvey tool is considered reliable, easy to use, and it is regularly updated; it could be further improved in terms of stability and functions, by making it more visible and reducing barriers to accessing it (i.e. being required to use EULogin to access the tool). In contrast, the outputs of the action "Sharing statistical production and dissemination services and solutions in the European Statistical System" are seen as useful in providing a framework for concrete applications; however, **the relatively lower perception of quality and satisfaction is due to the fact that the action's outputs are still at the development stage**

and more needs to be done to achieve more results and increase user satisfaction. This comparison of actions reconfirms one of the findings from Chapter 5 on the effectiveness of the ISA² programme: bringing solutions to maturity is essential for providing more benefits and results, translating into a more satisfied user base.

In light of these results, mature solutions such as EUSurvey should be continued as part of the Digital Europe Programme. In addition, solutions under development showing potential could be considered as part of the future strategy for interoperability and as part of the Digital Europe Programme, with a focus on continual development and bringing them to maturity.

Figure 31 Overview of the feedback to the perceived quality and utility survey (share of respondents indicating positive feedback)



Note: The results are based on the feedback from 11 stakeholders for action 2016.06, 17 stakeholders for action 2016.25 and 18 stakeholders for action 2016.35. The percentage reflects the share of stakeholders indicating positive and very positive feedback to the survey questions.

Source: Authors' elaboration based on the Perceived Quality and Perceived Utility Monitoring Reports for ISA² actions 2016.06, 2016.25, 2016.35, shared with the Study Team by DIGIT.D2 for the preparation of the Draft Final Study of the ISA² Evaluation.

Several recommendations for improving satisfaction with the solutions were made by respondents from all stakeholder groups:

- **Working more closely with the Member States.** Continued involvement of CIOs in the coordination with the Member States would be useful (this is ongoing within the Expert Group on Interoperability). This could also be expanded to engaging Member States representatives in a forum to support co-creation and problem solving (for instance, further engagement could be supported by grants through the Digital Europe Programme; so far, the Member States representatives have been involved without any funding support).
- **Better engaging users.** Respondents consider that there needs to be improved knowledge of the user base in order to better engage stakeholders in the development of solutions. The engagement should go beyond the level of CIOs and build upon a broader base of known actual users. Furthermore, when developing interoperability solutions more attention should be focused on co-creating solutions with the private sector (involving public and private actors from the very beginning of the process).
- **Financial instruments.** The fact that the programme was able to provide solutions but not financial support to implement them is one of the issues

undermining user satisfaction. The synergies with other sources of funding could be better utilised to make the take-up of solutions developed under the programme more visible and the needs of users could be better addressed. More efforts should be made to promote the awareness of public administrations and to increase their willingness to participate in interoperability projects. Such participation is often perceived as an obligation, or even a burden, especially in the case of small and medium-sized administrations. Thus, for example, future initiatives could provide funding-based incentives if public administrations contribute to or participate in initiatives to advance interoperability in the EU's public sector⁷⁴.

- **Agile process.** To better respond to user needs, an agile approach to developing solutions could be adopted, allowing more flexibility for changes to be made. This approach should be complemented with the concept of "sandboxing" by setting up some facilities to test solutions and gather better feedback.
- **Promotion.** When a solution has proved to be successful, it should be promoted as a European online service (as has been the case for EU Survey) so that stakeholders become more aware of the existence of the solution and can easily make use of it. In addition, more outreach to the internal users of the Commission would be useful.
- **Communication.** Continue improving communication and ensure that the messages are not too technical in nature. One of the strengths of the programme is that it has managed to broaden the participation in the work on interoperability, but more can be done, and this includes ensuring clear, less technical communication to appeal to wider audiences.
- **Focused efforts.** Importantly, to increase user satisfaction, the efforts should be concentrated on critical priorities, devoting the time to fewer, but more mature tools.

In addition to the feedback received from the consultation activities, two stakeholders provided feedback on the **ISA² evaluation roadmap**⁷⁵. One stakeholder brought up the need for more coordination with administration and additional technical support, as well as cooperation with civil society organisations. Another stakeholder noted that more emphasis should be put on the explicit promotion of open standards and Free Software is a key factor of enhanced interoperability.

Several successful cases can also be pointed out. An example of the re-use of an ISA² solution at the national level provides further evidence of the benefits of the programme for users. According to a solution user consulted for this evaluation, in Luxembourg, the [VocBench](#) solution was paired with an AI-based approach to deliver semantic interoperability for the health sector. The VocBench solution could be re-used to quickly enrich a proprietary technology and provide an overall better solution⁷⁶. In addition, the [webpages dedicated to the ISA² solutions](#) provide additional testimonials from users. Examples include:

- Representatives of public administrations [who use the Joinup](#) platform emphasise that one of the main benefits brought by the platform is the increase in the visibility of solutions developed.
- A representative of a public administration in Belgium points out that the [Open e-Prior solution](#) developed as part of the [European public procurement](#)

⁷⁴ Examples from literature further substantiate this point. See for instance: Leyden (2017), "Innovation in the public sector", and Heichlinger, Bosse (2017), "Promoting Public Sector Innovation: Trends, Evidence and Practices from the EPSA", in: Innovation in the Public Sector. Country experiences and Policy Recommendations, UNECE, Available at: https://unece.org/DAM/ceci/publications/Innovation_in_the_Public_Sector/Public_Sector_Innovation_for_web.pdf

⁷⁵ The feedback of stakeholders can be consulted at: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12311-eGovernment-services-across-the-EU-ISA-programme-final-evaluation>

⁷⁶ Further details about this use case can be consulted at the following address: <https://www.dynaccurate.com/about>

[interoperability initiative](#) has helped Belgian federal and regional institutions gain knowledge and develop an e-Invoicing solution using Open e-Prior.

- Within the European Commission, [EUSurvey](#) has supported different units to conduct large consultations, for instance in the framework of the Erasmus+ programme.

10 Sustainability

Key findings

Evaluation question 10: To what extent is the financial, technical and operational sustainability of the developed solutions – maintained and operated through the ISA² Programme – ensured?

- There are different levels of sustainability, depending on the **extent to which solutions would require further maintenance and updating in order to continue to deliver results**. Solutions may require lower or higher levels of maintenance and updating depending on their type: solutions in the form of guidelines and specifications can remain as a reference point and may require updating to keep up with developments in the field, but software solutions will likely require more frequent maintenance and support for them to remain accessible and useful.
- **Cost recovery options** such as introducing a fee for accessing solutions may be considered in the future. Nevertheless, **such options may have some negative implications overall**. First, ISA² solutions have been available free of charge; introducing a fee may discourage some solution users from choosing ISA² solutions over other options. Second, levying a fee may introduce the question of the need for public procurement process to be carried out by public authorities in the Member States. Third, the legal basis on which solutions were developed in the ISA² programme needs to be considered as well.

10.1 Introduction

The sustainability criterion measures the likelihood of the results of ISA² lasting beyond the completion of the programme. This section presents an overview of the primary data collected via the consultation activities and additional evidence that supports the analysis of the following **evaluation question**:

- EQ.10: To what extent is the financial, technical and operational sustainability of the developed solutions – maintained and operated through the ISA² Programme – ensured?

Based on the Evaluation Framework (see Annex F) the evaluation question can be broken down into the following **judgment criteria**:

- Extent to which the results achieved by the ISA² programme are expected to last if funding for actions covered by the programme would not be available in the future;
- Extent to which 'cost recovery' solutions could be introduced.

10.2 Analysis

Extent to which the results achieved by the programme are expected to last

The **sustainability of the programme's results depends significantly on the type of outputs**, given the diversity of actions and solutions of the ISA² programme which range from guidelines to software applications. **Consulted stakeholders generally have a positive view of the sustainability of ISA² solutions**, which are seen as likely to continue to deliver results even after the end of the programme (see Figure 32). Importantly, solution users in particular consider that this will almost definitely be the case. Solutions which have become central to their needs will continue to be sought after by solution users.

If no additional funds will be available, the current assets will continue to be used, e.g. the validation and conformity testing of datasets under INSPIRE. Widely used solutions such as Joinup and EUSurvey will continue to operate, but maintenance costs would still need to be covered. For less mature solutions there will be a need for further investment, as part of, for instance, the Digital Europe Programme.

Figure 32 Likelihood that results achieved so far would last if funding for actions covered by the programme would not be available in the future (breakdown by group of stakeholders; average score and number of respondents)



Score: (-2) definitely would not; (-1) probably would not; (1) probably would; (2) definitely would;

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via targeted consultation activities. Total number of respondents: 58.

Further evidence from desk research shows the nuances of sustainability, depending on the extent to which solutions would require further maintenance and updating in order to continue to deliver results. Solutions may require lower or higher levels of maintenance and updating depending on their type: solutions in the form of guidelines and specifications can remain as a reference point and may require updating to keep up with developments in the field, but software solutions will likely require more frequent maintenance and support for them to remain accessible and useful. The general consideration behind this assessment is that software tends to require more work on updates and maintenance than guidelines and specifications would. While maintenance is generally considered to be necessary for software tools, one can also distinguish between consistent upgrades to keep up with technological developments and more regular maintenance work to ensure that the tool continues to cater to users' needs. Some software tools are quite complex for various reasons, for example, if they include real-time interaction between many people who are simultaneously sharing material in various formats and require a high level of security. Such tools are typically subject to ongoing development as they tend to evolve by including more and better features, more controls, improved security and privacy, and more complex technology, such as AI. Examples include the action on the European citizens' initiative and [EUSurvey](#). Other tools may be less prone to change because they are more static. This may include various databases where the major work concerns adding new material, which is a task for users, and the IT role is mainly to keep the system running. An example is the [RegDel](#)⁷⁷. A breakdown by the sampled solutions is available in Annex G.9.

⁷⁷ The RegDel solution is an IT tool supporting the inter-institutional Register for Delegated Acts, an initiative aiming to increase the transparency of the preparation and adoption of delegated acts.

Overall, **the achievements of ISA² could continue to be supported through the Digital Europe Programme and beyond**, under a coherent policy approach to interoperability in the EU's public sector. What has been achieved so far should be nurtured further. Mature solutions could be maintained so that they can continue to create benefits for users. At least a selection of key solutions in the development stage could continue to be developed and improved up to the maturity stage, in line with key findings noted in Chapters 5 and 9 on the effectiveness and utility of the programme. In addition, without promotion and awareness-raising, developed solutions run the risk of becoming "invisible" to potential users, thus the maintenance of mature solutions and the further development of less mature solutions should also account for the need to promote visibility.

Cost recovery

Beyond carrying forward the achievements of ISA² and further supporting the work of the programme as part of new initiatives, the question of cost recovery may also be considered in discussing the sustainability of results. In this regard, charging a fee for access could be considered as an option, especially in the case of mature solutions that have proven their worth to their user base; in this case, a fee could support the ongoing maintenance of the solution, ensuring the quality of the solution for the user base. Yet, as emphasised in the Interim Evaluation of the ISA² programme⁷⁸ and further supported by ongoing developments in the field, a fee-based approach could face several issues:

- ISA² solutions have traditionally been freely available; a fee-based approach may have a negative effect on the willingness of stakeholders to use ISA² solutions and may seek other options. Moreover, the 2020 Berlin Declaration calls for the EU institutions to promote "the development, sharing and re-use of open source standards, solutions and specifications across borders.". If the terms of access were to change, some users may be tempted to switch to other solutions;
- Public procurement rules may need to be applied by public authorities in the EU if access to ISA² solutions were to be conditional on a fee, opening the competition to solutions from other providers as well;
- For some solutions, the legal basis might not allow for the introduction of such a fee if the solutions are designed to, for instance, enhance the transparency of the policymaking process.

⁷⁸ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), pp. 92-93.

11 Conclusions

Throughout its existence, the ISA² programme brought benefits across multiple areas, contributing to developing and supporting digital solutions, frameworks and specifications to enhance the interoperability of public services in the EU. While the evaluation is **generally positive** and reconfirms some of the conclusions of the interim evaluation exercise, there are **clear areas of improvement that need to be considered in the development of new measures** to support the digitalisation and interoperability of the EU's public sector at all levels. Moreover, given the ambitions of the EU's digital agenda for the coming years, it is essential to build on the achievements of ISA² and improve on the shortcomings in order to ensure that the ambitions are met. This Chapter summarises the main findings of this Study from the seven evaluation criteria (relevance, effectiveness, efficiency, coherence, EU added value, utility, and sustainability), emphasising the elements of the programme that worked well, the elements of the programme that could be improved upon, whether further measures might be necessary for the future and the overall lessons learnt.

Successful elements of the intervention

The roll-out of the ISA² programme was successful in several areas: i) the actions and solutions developed achieved at least to some extent the objectives of the programme; ii) the implementation of the programme was relatively efficient and fit for purpose; iii) while managing a complex framework of multiple actions across different fields, the programme generally retained its coherence; iv) the programme, as an EU-level intervention, brought clear added value compared to national initiatives alone.

The evaluation confirmed that the ISA² programme was **relatively effective in achieving several objectives**: facilitating the re-use of interoperability solutions, supporting the implementation of EU policies and actions through interoperability solutions, and contributing to the promotion of a holistic approach to interoperability in the EU (see Chapter 5). Several factors contributed to the performance of the programme. In particular, the programme responded to the need of public administrations for common interoperable tools and helped public administrations mitigate budgetary constraints to a certain extent through the solutions provided. When it comes to the role of the programme in the wider EU policy framework and the overall interoperability landscape, ISA² was found to be particularly synergetic with other EU programmes and initiatives in the field of public sector digitalisation and modernisation (Chapter 7). These include the CEF programme, the SDG, and ERDF. Overlaps were relatively limited, but they could appear between ISA² and funding instruments for public sector modernisation and digitalisation.

In addition, the ISA² actions also contributed to the implementation of the EIF and the IAP (Chapter 8). The evaluation confirmed, based on an analysis of sampled actions, that several ISA² actions provided overarching support for monitoring the implementation of the EIF (such as the NIFO action). At the same time, the solutions developed as part of ISA² actions were based on specific principles, models, and / or recommendations of the EIF, thus contributing to the implementation of the framework. Furthermore, the programme also contributed to the implementation of the IAP. The evaluation also found a direct relationship between several ISA² actions and the actions listed in the IAP, while other ISA² actions provided broader contributions across several areas of the IAP.

The **implementation of the programme** was deemed to have been efficient (Chapter 6). The work across ISA² packages progressed as expected, with final work undertaken in 2021 to bring the activities of the programme to an end and facilitate the transition to the Digital Europe Programme. The benefits stemming from the programme were also estimated to be greater than the costs for the ultimate beneficiaries of the solutions developed, with the caveat that the diversity of ISA² actions and outputs makes it difficult to carry out a full-scale analysis and comparison of the cost-effectiveness of actions. An

analysis of packages with comparable indicators for the sampled actions shows that the costs of implementing and maintaining the actions and their solutions are low relative to the wide base of end-users (i.e., citizens and businesses).

Furthermore, the **process of selecting actions** to be included in the rolling work programme was **relatively fit for purpose**. First, the costs of preparing and submitting proposals as part of the selection process were very small relative to the average budget of an ISA² action. Considering the preparation of a new proposal at the beginning of the programme and its update for every yearly iteration of the Rolling Work Programme, the administrative costs of preparing and updating the proposal over 5 years amounted to only 0.5% of the total average budget allocated to accepted proposals. Second, proposals for actions could also be submitted by the Member States, but in practice, only a limited number of proposals were received from the Member States.

Building on the selection process of actions and the overall governance of the programme, the evaluation confirmed **synergies between the actions of the programme** to some extent, noting that overlaps remained limited (Chapter 7).

The evaluation also confirmed the **added value** of having an EU-level intervention for interoperability (Chapter 8). National or sub-national initiatives alone would have brought only limited contributions towards most of the objectives pursued by ISA². In fact, the objectives require almost by definition an EU approach. The programme also probably achieved its objectives at costs that were lower than the costs of national or sub-national interventions. The EU added value of the programme resides in its support to cross-border interoperability. Instances of re-use of ISA² solutions by public administrations in the Member States contribute to enhancing cross-border interoperability.

Looking also at **international initiatives as part of external coherence**, it is noteworthy that ISA² takes an approach that is consistent with recommendations on Digital Government put forward by the OECD (Chapter 7). Given the practical approach taken in the programme, the clear added value of ISA² consists in the concrete interoperable solutions it helped develop, which in turn help harmonise interoperability in the public sector.

Less successful elements of the intervention and areas of improvement

While the programme had notable achievements across a variety of areas, as emphasised earlier, the evaluation also identified **more limited achievements and areas for future improvement**. These include: i) the need to stimulate greater take-up of solutions; ii) limited achievements with respect to several objectives; iii) the need for improved metrics for a clear comparative picture of costs and benefits across actions; iv) the need to further increase the utility of solutions; v) further engaging Member States; vi) ensuring that all synergies between actions are tapped.

The evaluation found that while ISA² solutions are re-used across the Member States, more could be done to enhance the **take-up of solutions**, especially at regional and local levels (see Chapter 5). There are two main areas of improvement in this sense, namely focusing on bringing solutions to maturity and ensuring clear dissemination and fostering one-stop-shop solutions that allow users to clearly see and access available resources.

More limited achievements were noted concerning several objectives pursued by the programme (see Chapter 5). First, there is a need for more metrics and methodologies to assess cost-savings stemming from the use of interoperable solutions, as well as their more qualitative impacts. A more comprehensive overview of the impacts of interoperable solutions could be gained by using a common methodological approach to identify benefits in the form of cost-savings or benefits in the form of improved quality of services, more user-friendliness, etc. Second, with an ever-evolving legislative landscape, the recent work done under the ISA² programme to identify legislation gaps hampering cross-border and

cross-sectoral interoperability should be continued in the future to keep up with changes and deliver more results.

In addition, the evaluation emphasised that, given the diversity of ISA² actions and types of outputs, a full-scale analysis and comparison of the cost-effectiveness of ISA² actions and solutions were difficult to carry out (see Chapter 6). Against this background, to improve the assessment of cost-effectiveness, future programmes could consider developing common metrics to measure the performance of interoperability solutions.

In terms of utility (Chapter 9), ISA² solutions contributed to some extent to the main needs and problems experienced by stakeholders, but more could be done to increase the utility of solutions. A key takeaway in this regard is the need to focus on a smaller set of solutions and bringing them to maturity (as emphasised in Chapter 5 as well).

Some of the achievements of the programme could be enhanced even further. As noted earlier, a good feature of the selection process of actions was the fact that the process was open for proposals from the Member States. Nevertheless, only few proposals were submitted by Member States. Enhancing the involvement of Member States in similar processes would be an area for improvement to consider in the future.

Finally, while the programme was generally coherent internally, it was noted that the programme was also quite complex. The numerous actions supported by ISA² posed a risk of fragmentation whereby some synergies may not be fully explored.

Will issues be resolved over time or do they need to be addressed with specific measures?

The findings of the evaluation with respect to the sustainability of solutions and the overall relevance of the programme need to be considered in order to understand how the identified issues would evolve over time.

The **sustainability of the programme's results depends significantly on the type of outputs**, given the diversity of actions and solutions of the ISA² programme which range from guidelines to software applications (Chapter 10). Solutions may require lower or higher levels of maintenance and updating depending on their type: solutions in the form of guidelines and specifications can remain as a reference point and may require updating to keep up with developments in the field, but software solutions will likely require more frequent maintenance and support for them to remain accessible and useful. **Cost recovery options** such as introducing a fee for accessing solutions may be considered in the future. Nevertheless, **such options would likely have some negative implications**. They may introduce the question of the need for public procurement processes to be carried out by public authorities in the Member States. In addition, the extent to which such options would go or not against the legal basis on which solutions were developed under the ISA² programme needs to be considered as well.

Importantly, the **relevance of the programme and interoperability more generally has been emphasised during the COVID-19 pandemic** (Chapter 4). The pandemic has exacerbated existing needs, including the need for coordination when implementing digital solutions, and it has given rise to specific interoperability challenges, such as the need for interoperability in developing digital solutions to manage the effects of the pandemic. What is evident is that the achievements of ISA², having an operational focus, need to be complemented with more consistent governance of interoperability in the EU.

In this context, the evaluation drew several lessons from the analysis of the implementation of the programme over its duration from 2016 to 2020. The lessons learnt are summarised in the remainder of this Chapter, emphasising the measures that could be considered in the future.

Lessons learnt

Overall, the performance of the programme matched to some extent the expectations. In light of the identified achievements and areas of improvement, **lessons can be drawn**, taking stock of the experience of the ISA² programme to build towards other initiatives. The lessons learnt relate to three key areas: i) ensuring that the achievements of ISA² remain relevant and further support interoperability initiatives in the EU; ii) strengthening the take-up of interoperability solutions; and iii) developing improved metrics to measure the performance of interoperability solutions.

Future initiatives in the field of public sector interoperability in the EU could build on the achievements of the ISA² programme. To ensure that the outputs of the programme remain fully relevant and that they contribute to new initiatives and a coherent interoperability landscape in the EU, the following measures could be considered (based on the key findings in Chapters 4 and 7):

- **Supporting collaboration and exchanges of best practices** between Member States in a structured and proactive manner.
- **Building a holistic, multi-dimensional approach to interoperability** as part of the Digital Europe Programme to respond to challenges that cut across multiple domains.
- **Developing an enhanced governance of interoperability in the EU** that, among others, would allow for the benefits stemming from the ISA² programme, at the more operational level, to be fully realised. The planned “reinforced EU governments interoperability strategy” could thus provide a more binding framework for interoperability, building on the commitment of the Member States to this issue.
- **Focusing on fully tapping into potential synergies**, particularly with initiatives designed to provide funding in the area of digitalising public services and initiatives targeting the regional and local levels such as the [Living-in.eu](https://living-in.eu) movement.
- **Enhancing synergies** with other sources of funding to enhance the take-up of solutions developed under the programme.
- **Increasing awareness in the public sector of the key role of standards** in the digital transformation strategy and in fully supporting the twin digital/green and digital transitions, engaging national standards organisations and national trade associations (as part of the Digital Europe Programme and in the development of the European Data Spaces).
- **Improving and making systematic** the link between the components of the Digital Europe Programme and the Multi-Stakeholder Platform for ICT Standardisation.

In the future, the take-up of interoperability solutions could be further increased. Based on the findings from the analysis of the relevance, effectiveness, EU added value, and utility of the programme (Chapters 4, 5, 8, 9), the following measures could be taken in the future:

- **Focusing the efforts on developing a smaller set of key mature solutions**, continually developing them and nurturing their take-up. This can be done as part of the Digital Europe Programme and the future strategy for interoperability in the EU’s public sector. Concentrating the efforts on critical priorities and user needs could also increase user satisfaction.
- Focusing on enhancing the take-up of digital tools and solutions at **regional and local levels** with the support of the Member States.
- **Better engaging users** by building upon a broader base of known actual users, and co-creating solutions with the private sector,
- **Ensuring a feedback loop with the users of digital tools** in order to improve the functioning of digital tools and solutions.

- Setting up an **agile process in developing solutions**, to allow more flexibility for changes to be made, coupled with a “sandboxing” approach for testing solutions and gathering better feedback.
- Ensuring **clear dissemination and providing one-stop-shop solutions** that allow users to clearly see and access available resources;
- **Promoting successful solutions** as European online services to increase awareness and continuing to **raise awareness** through communication activities.

Finally, the evaluation also outlined several measures that could be taken to build a clear picture of the benefits and performance of interoperability solutions (Chapters 5 and 6)

- Building on the key conclusions of the Interim Evaluation of the ISA² programme, future programmes should focus on **developing common metrics to measure the performance of interoperability solutions**. This would in turn bring a more comprehensive overview picture of cost-effectiveness, allowing for comparisons and a better understanding of the efficiency of the activities undertaken.
- The Digital Europe Programme or connected initiatives could continue to explore different avenues to contribute to Action 20 of the IAP (“Develop, maintain and use mechanisms and tools assessing the maturity, costs and benefits of interoperability”).

Annexes

Annex A Synopsis report of the consultation activities

Background

Interoperability is a key enabler of any digital transformation, as it allows organisations to interact and achieve mutually beneficial goals. In the public sector, interoperability is essential to provide digital cross-border public services to citizens, businesses or other administrations across Europe.

The ISA² programme (Interoperability solutions for public administration, businesses and citizens) has been the latest iteration in a series of programmes meant to support interoperability in the EU, starting from the 1990s. By identifying, creating and facilitating the re-use of interoperability solutions, ISA² aims to promote a holistic approach to interoperability in the EU, and thus – as a key enabler – it supports the implementation of various Union policies and contribute to the completion of the DSM. ISA² is also the principal instrument for implementing the revised EIF and its annex, the IAP. To achieve its objectives the programme had a budget of €131 million distributed over five years, from 1 January 2016 until 31 December 2020, and relied on:

1. Actions funded by the **ISA² programme** between 2016 and 2020, which supported the development of digital solutions that enable public administrations, businesses and citizens in Europe to benefit from interoperable cross-border and cross-sector public services;
2. Governance, provided by the **ISA² Committee** until December 2020,⁷⁹ which consisted of national public sector representatives responsible for eGovernment-related issues.

The completion of ISA² is an important milestone towards an interoperable European public sector, as envisaged by Decision (EU) 2015/2240 establishing the ISA² programme. The final Evaluation of the ISA² Programme, together with the back-to-back Evaluation of the EIF, will provide key insights for the preparation of a Future Interoperability Strategy of the EU.

Against this background, the main objective of the consultation activities was to **collect information, views and opinions from the relevant stakeholders** of the ISA² programme. In particular, the consultation activities looked into the **performance of the ISA² programme**, focusing on seven evaluation criteria:

- **Relevance** – the alignment between the objectives of the programme and the current needs and problems experienced by stakeholders;
- **Effectiveness** – the extent to which the programme has achieved its objectives;
- **Efficiency** – the extent to which the programme’s objectives are achieved at a minimum cost;
- **Coherence** – the alignment between the programme and comparable EU initiatives as well as the overall EU policy framework;
- **EU added value** - the additional impacts generated by the programme, as opposed to leaving the subject matter in the hands of Member States;
- **Utility** – the extent to which the programme meets stakeholders’ needs; and
- **Sustainability** – the likelihood that the programme’s results will last beyond its completion.

⁷⁹ As the ISA² programme came to an end in December 2020, the ISA² Committee ceased to exist.

Types of consultation activities conducted

To collect the necessary primary information and data from the relevant stakeholders to feed into the evaluation of the ISA², the following **consultation activities**⁸⁰ were performed:

- The **online kick-off workshop** “How interoperability can achieve seamless data flows and services for the EU’s public sector”, conducted on 3 December 2020 and aimed at raising awareness about the ISA² evaluation and engaging stakeholders in the process.
- An **online survey** (19 January – 7 March 2021⁸¹), targeting specific stakeholder groups.
- **In-depth interviews** (1 February – 8 March 2021) with 9 selected stakeholders to collect detailed data and information from key stakeholders contributing to the evaluation. The interviews are complemented by expert assessments conducted by the five independent experts who were tasked with completing the questionnaire that served as the basis for the in-depth interviews.
- A 12-week long, Internet-based **public consultation** (1 February – 26 April 2021), which was available in English, German, and French.
- The **validation workshop** “What are the key achievements and lessons from ISA² for the future of interoperability in the EU’s public sector?”, organised on 22 April 2021 as part of the DigitALL Public Conference. The workshop discussed the preliminary findings of the Final Evaluation of the ISA² programme with stakeholders.

In addition, two stakeholders provided [feedback](#) on the **ISA² evaluation roadmap**.

The consultation activities targeted several groups of stakeholders, i.e. stakeholders of the ISA² programme as well as stakeholders of public sector interoperability. The following grouping of stakeholders was used to analyse the feedback to the consultation activities for the ISA² evaluation:

- Experts and academia (including the independent expert assessments);
- ISA² action owners (Commission representatives in charge of specific actions defined under ISA²);
- ISA² solution users (both at EU and national level);
- National and sub-national interoperability actors (national and sub-national public authorities with good knowledge of the programme);
- Programme governance (Commission and Member States representatives who are directly involved in the governance of the EIF and ISA²);
- Stakeholders involved in the implementation of linked EU policies (Commission representatives who are responsible for expert groups linked to ISA²/EIF or are in charge of EU initiatives potentially linked to ISA²/EIF);
- Wider public (including citizens, businesses, NGOs, and respondents from public authorities with a more limited knowledge of the ISA² programme).

The questionnaires used throughout the consultation activities mainly used Likert scale responses. Respondents were thus asked to provide their feedback by referring to a scale from (1) to (5) or (1) to (4), depending on the type of question:

- (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely;

⁸⁰ The evaluation process of the ISA² programme ran simultaneously with the evaluation of the European Interoperability Framework and the impact assessment of a future interoperability policy for the EU’s public sector. Given the important synergies between the two Evaluation Studies and the Impact Assessment, a joint consultation strategy for the targeted and public consultations was proposed in order to ensure coordination and the best allocation of resources for collecting primary data from the stakeholders.

⁸¹ The official deadline for contributing to the online surveys was initially set on 15 February 2021. The deadline was extended to 7 March 2021 to allow for more contributions.

- (1) definitely would not; (2) probably would not; (3) probably would; (4) definitely would.

With a **total of 102 respondents**, the consultation activities reached all stakeholders listed above. Table 9 presents the breakdown of responses by stakeholder groups and consultation activity. In what follows, the feedback received during the consultation activities are presented according to the type of consultation, i.e. public versus targeted consultation. As to the latter, feedback received during in-depth interviews are grouped together with those from the targeted online survey since both consultation activities were based on the same questionnaire, only more qualitative feedback was sought in the in-depth interviews.

Table 9 Overview of respondents engaged by the consultation activities by stakeholder group

Stakeholders \ Consultation	In-depth interview	Online survey	Public consultation	TOTAL
Experts and academia	5*	8	-	13
ISA ² action owners	3	12	-	15
ISA ² solution users	1	4	-	5
National/sub-national public authorities	-	10	5	15
Programme governance	2**	7		9
Stakeholders involved in the implementation of linked EU policies/initiatives	3	4	2	9
Wider public	- (invited to participate in the public consultation only)	- (invited to participate in the public consultation only)	36	36
TOTAL	14	45	43	102

*The five in-depth interviews conducted with the group of experts and academia correspond to the five expert assessments.

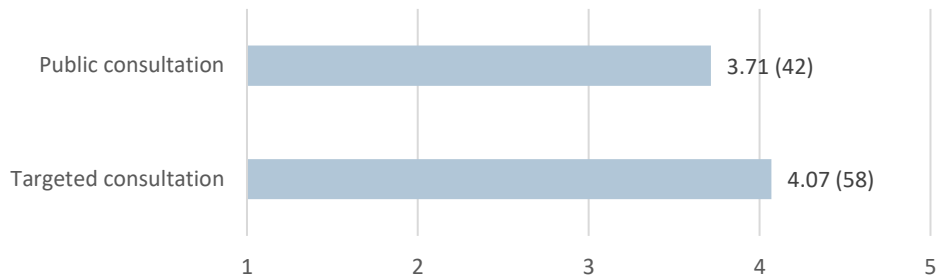
**One follow-up interview to the targeted online survey was conducted.

Source: Authors' elaboration based on the answers received to the consultation activities

Overall, the respondents exhibit a high level of knowledge both when it comes to digital public services and interoperability (see Figure 33) and the ISA² programme (see Figure 34). As to digital public services and interoperability, ISA² solution users and the wider public have a slightly lower level of knowledge of the field, while experts and academia have the greatest level of knowledge among the stakeholders' groups. Similarly, most respondents are generally familiar to some extent or to a great extent with the ISA² programme, with the wider public scoring lowest among the stakeholders. Finally, almost half of the total respondents (45) are familiar with at least three packages of ISA² (see Figure 35).⁸² Considering the breadth of actions and the variety of stakeholders of the programme, it is natural that some of the consulted stakeholders may be less familiar with some areas of the programme and more familiar with those with which they have interacted more closely.

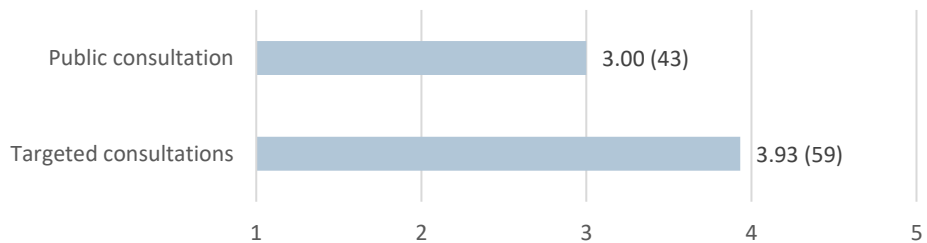
⁸² The ISA² actions are grouped in nine work packages defined in the annual rolling work programmes. Further details can be consulted here: https://ec.europa.eu/isa2/library/isaisa%C2%B2-work-programme_en

Figure 33 Knowledge of digital public services and interoperability (breakdown by type of consultation; average score and number of respondents)



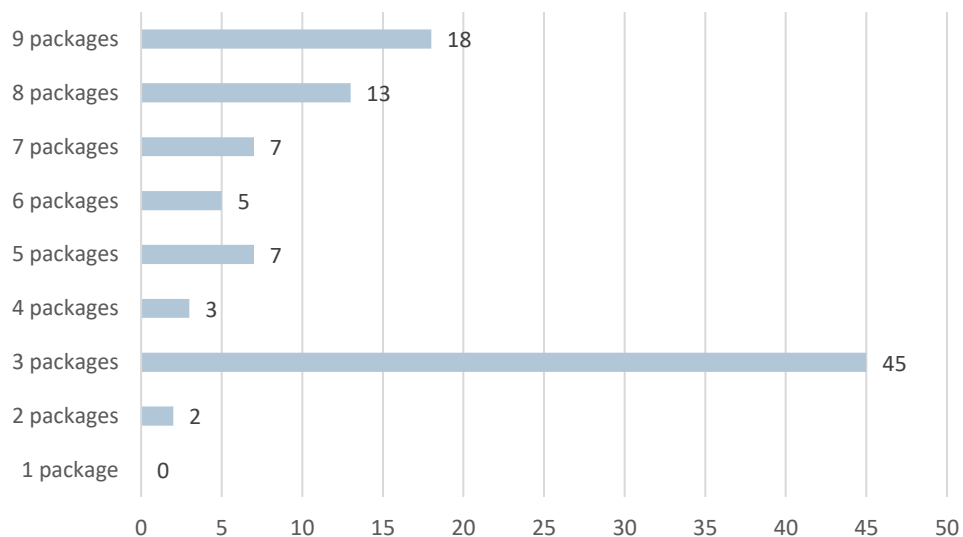
Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).
 Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 100.

Figure 34 Knowledge of ISA² (breakdown by type of consultation; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).
 Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 102.

Figure 35 Knowledge of ISA² action packages (number of respondents familiar with a given number of packages)



Note: Stakeholders were considered to be familiar with a package if they indicated that they had knowledge of the package "to some extent", "to a high extent" or "to the fullest extent".
 Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 100.

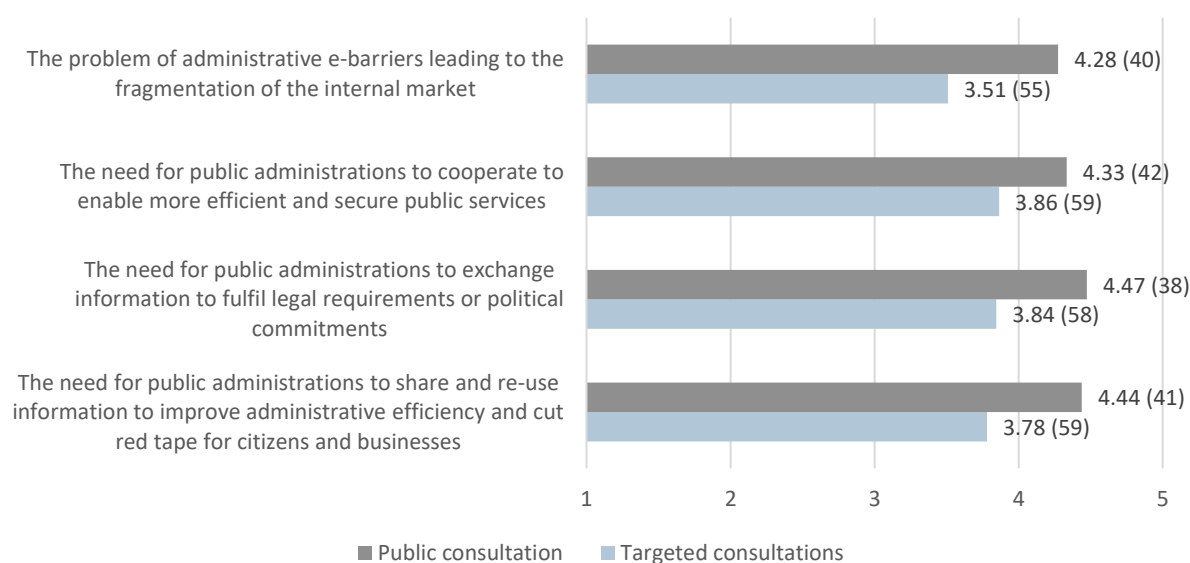
In terms of geographic distribution, the targeted consultation reflects inputs from both the EU and national levels; representatives from the relevant EU institutions, as well as representatives from Member States,⁸³ participated in the targeted consultation.

Results

Relevance

The ISA² programme is deemed relevant by consulted stakeholders as it has contributed to addressing public administrations' needs to cooperate and enable more efficient and secure public service, to exchanging information in order to fulfil legal requirements or political commitments, and to sharing and re-using information to improve administrative efficiency and cut red tape. In particular, the wider public, consulted through the public consultation, considers that ISA² has contributed to a great extent to existing needs and problems. By contrast, targeted respondents identify a more limited contribution (see Figure 36). The feedback also confirms that such needs and problems are still an issue for interoperability in the EU's public sector. Not surprisingly, respondents to the targeted consultation consider the underlying needs and problems to be relatively more important for European public administrations than respondents to the public consultation.

Figure 36 Extent to which achieving ISA² objectives contribute to addressing the needs and problems originally addressed by the programme (breakdown by type of consultation; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents for each need and problem from top to bottom: 95, 101, 96, 100.

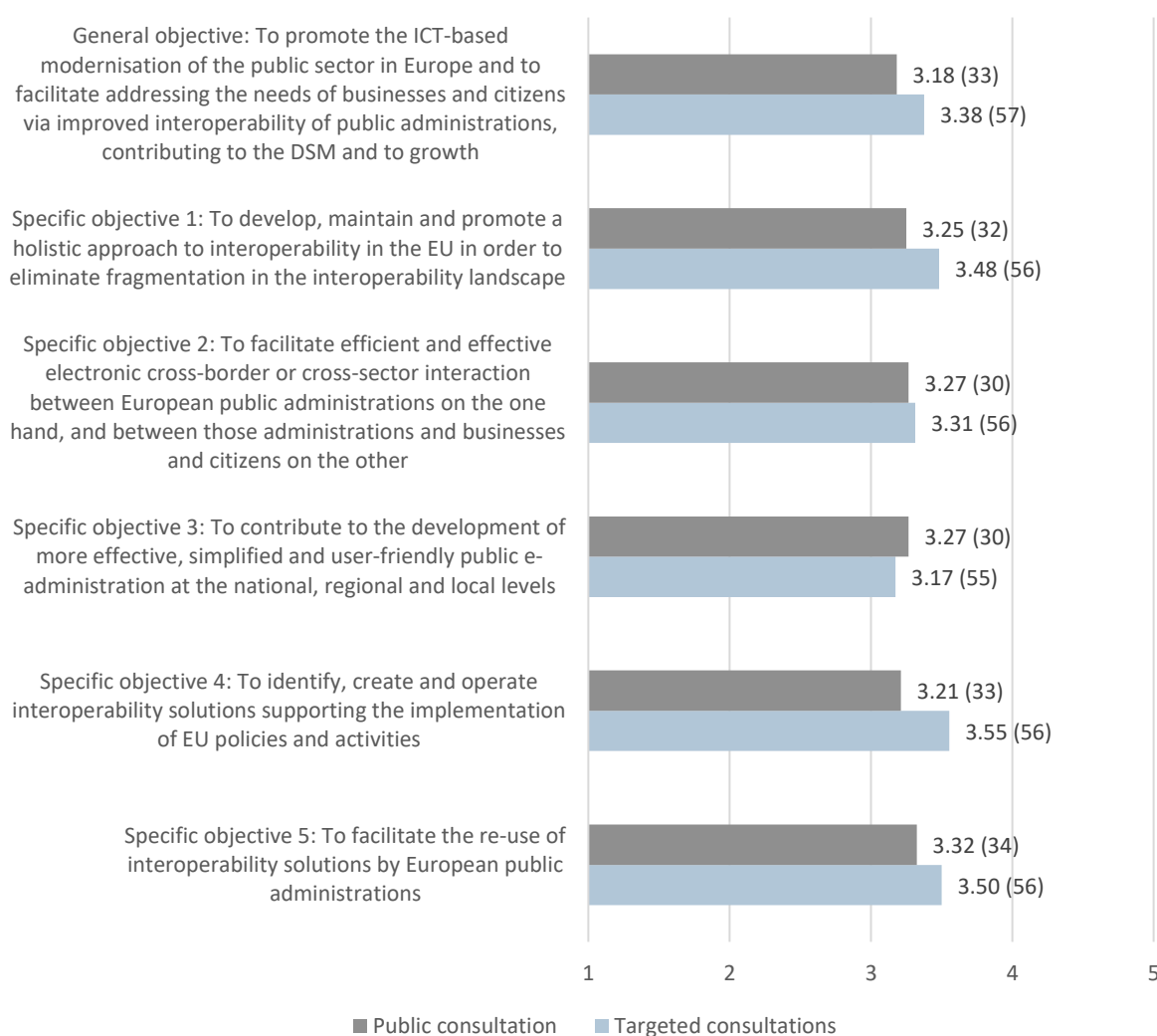
Consulted stakeholders emphasised additional needs: the need for coordination and interoperable digital solutions deriving from or exacerbated by the COVID-19 pandemic, the need for digital skills, the need to exchange best practices, the need feedback loop with citizens to ensure the good functioning of the digital tools and solutions, and the need for consistent governance of interoperability initiatives.

⁸³ Feedback received from the representatives at the national and regional levels covers the following Member States: Austria, Belgium, Cyprus, Denmark, Finland, Greece, Hungary, Italy, Malta, the Netherlands, Spain, and Sweden.

Effectiveness

ISA² is considered **effective** in creating and operating interoperability solutions for the implementation of EU policies and actions and facilitating the re-use of such solutions. The programme has also contributed to promoting a holistic approach to interoperability in the EU. When it comes to these aspects, Figure 37 shows that respondents to the targeted consultation are overall slightly more optimistic about the results of the ISA² solutions in achieving the programme's objectives.

Figure 37 Extent to which ISA² solutions contributed to achieving the programme's objectives (breakdown by type of consultation; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 90 (General objective), 88 (Specific objective 1), 86 (Specific objective 2), 85 (Specific objective 3), 89 (Specific objective 4), 90 (Specific objective 5).

Nonetheless, respondents place particular emphasis on the fact that the re-use of interoperability solutions could be further enhanced, building on the facilitating role played by ISA². In addition, results have been **achieved only to a limited extent** or to some extent when it comes to reducing the cost and administrative burden of cross-border interaction, removing the administrative e-barriers and contributing to the swift implementation of ICT systems supporting EU legislation.

Several respondents emphasised that **concentrating the efforts on a more limited set of actions and solutions could lead to enhanced achievements**.

Efficiency

Action owners and stakeholders involved in the governance of the programme provided feedback regarding the efficiency of the process for selecting actions funded by ISA². The **selection process of ISA² actions** is deemed to have been **relatively efficient and fit for purpose**. Relying on an online platform have helped streamline the process. Respondents also emphasised that one of the positive aspects was that Member States could submit proposals, alongside European Commission services. Nevertheless, only a limited number of proposals were received from the Member States.

Furthermore, respondents from the same categories provided information regarding the amount of **time they spent on preparing and submitting a proposal** for an action to be considered by the ISA² programme. This time varies from two to three person-days up to 25 person-days to complete the proposal. The differences in the reported time required reflect the types of actions put forward such as new actions or previous actions for which one can rely on previously accumulated experience.

Coherence

The consultation activities focused on both the **internal coherence** of the programme, i.e. the synergies or overlaps existing between the ISA² actions, and its **external coherence**, namely the synergies or overlaps between ISA² and other EU initiatives, policies, or programmes.

Internal coherence

In terms of **internal coherence**, there are synergies between the actions to some extent and limited overlaps, as confirmed by stakeholders involved in the targeted consultations. However, respondents to the targeted consultations also emphasised that the fragmentation of the programme in multiple different actions makes it difficult to fully tap into all synergies.

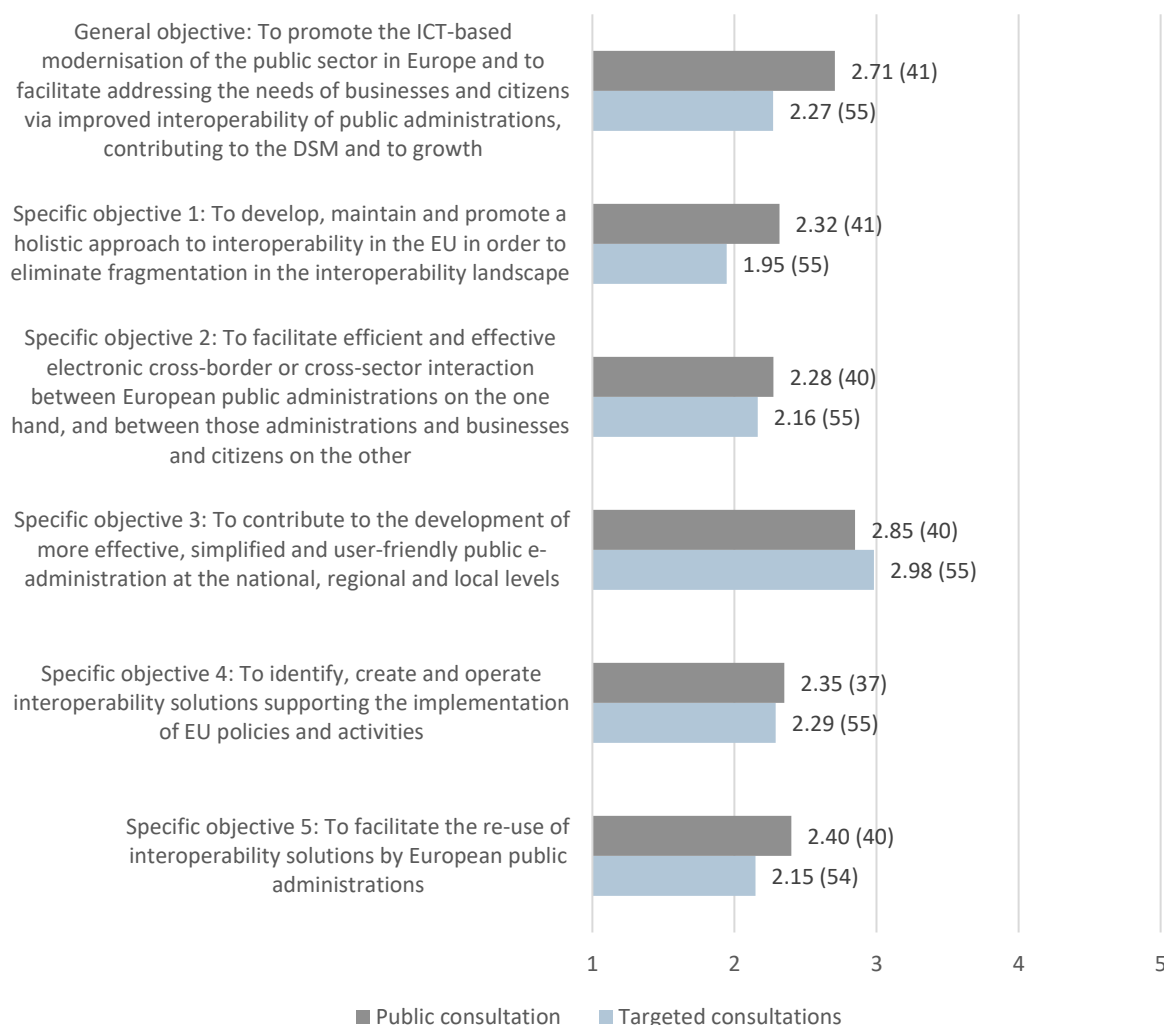
External coherence

In terms of **external coherence**, consulted stakeholders note that ISA² is particularly synergetic with CEF, result consistent across the targeted and public consultations. Participants to the targeted consultation also emphasised strong synergies between ISA² and both the [European Digital Strategy](#) and the [European Data Strategy](#).

EU added value

Many respondents confirm that national or sub-national initiatives alone would have brought only limited contributions towards most of the objectives of ISA², confirming the **EU added value of the programme** (see Figure 38). Overall, stakeholders participating in the targeted consultation are less convinced of the ability of national or sub-national interventions to achieve ISA² objectives in the absence of the programme.

Figure 38 Extent to which national or sub-national interventions would be able to achieve the ISA² objectives in the absence of the programme (breakdown by type of consultation; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 96 (General objective), 96 (Specific objective 1), 95 (Specific objective 2), 95 (Specific objective 3), 92 (Specific objective 4), 94 (Specific objective 5).

Respondents agree that ISA² can probably achieve its objectives at costs that are lower than the costs of national or sub-national interventions. It is also important to mention that consulted stakeholders consider that ISA² has contributed to some extent to enhancing cross-border interoperability. While noting the achievements of the programme, stakeholders confirm that other EU instruments have complemented the programme (e.g., the Open Data Directive⁸⁴) and that achieving cross-border interoperability depends on the adoption of solutions by the relevant public administrations.

⁸⁴ Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561563110433&uri=CELEX:32019L1024>

Utility

Stakeholders involved in the targeted consultations point out that ISA² solutions have contributed to some extent to addressing the main needs and problems originally identified by the programme and are slightly less positive when it comes to the additional needs and problems experienced by stakeholders.

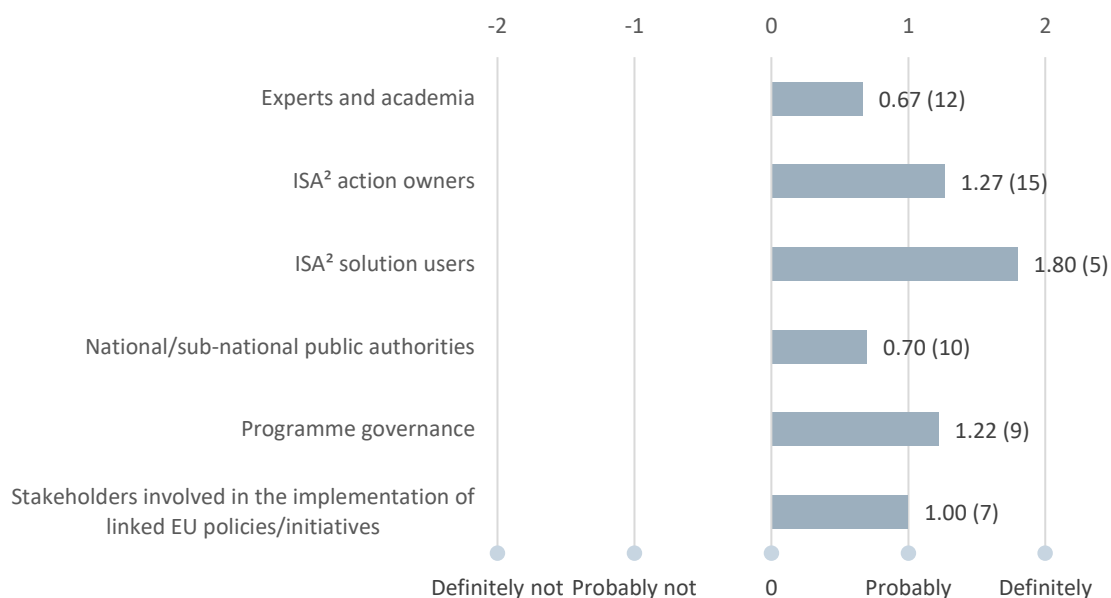
With the caveat that the number of responses from solution users is low, the feedback received from respondents to the targeted consultations in terms of user satisfaction tends to be positive. Nevertheless, the **utility of the programme** could be further enhanced by working more closely with the Member States, increasing the promotion of solutions and ensuring that the communication of results is accessible to non-expert audiences.

In addition to the feedback received from the consultation activities, two stakeholders provided feedback on the **ISA² evaluation roadmap**. One stakeholder emphasised the need for more coordination with administration and additional technical support, as well as cooperation with civil society organisations. Another stakeholder noted that more attention should be paid to the explicit promotion of open standards and Free Software as a key factor in enhanced interoperability.

Sustainability

In terms of **sustainability**, Figure 39 shows that consulted stakeholders in the targeted consultation generally have a positive view of the sustainability of ISA² solutions, indicating that the solutions developed are expected to continue delivering their results even after the programme ends; however, some solutions may also require maintenance costs.

Figure 39 Likelihood that results achieved so far would last if funding for actions covered by the programme would not be available in the future (breakdown by type of stakeholders; average score and number of respondents)



Score: (-2) definitely would not; (-1) probably would not; (1) probably would; (2) definitely would;

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 58.

Annex B Differences in stakeholder groupings between the interim and final ISA² evaluations

To facilitate the comparability of results with the interim evaluation of the ISA² programme, the Study Team followed a similar approach when clustering stakeholders in the final evaluation. Nevertheless, the Study Team reassessed the grouping of stakeholders, balancing the need to preserve consistency with the grouping presented in the interim evaluation with the need to properly weight and cluster stakeholder responses, respecting at the same time the logic of the consultation strategy. Table 10 presents the differences between the stakeholder groups of the two evaluation studies and provides explanations on any relevant changes between the grouping of stakeholders.

Table 10 Mapping of stakeholders' categories: differences between the interim and final evaluations

Stakeholder category	Interim evaluation	Final evaluation	Rationale supporting the differences in stakeholder groupings
Experts and academia	-	14	A category "Experts and academia" is introduced in the final evaluation to account for the answers received from academic experts in the field of interoperability. Answers were received via the independent assessments of the five experts which are part of the Research Team for this Study supporting the Final Evaluation of ISA ² , as well as through the targeted online survey. In addition, two answers to the online survey coming from experts involved in standardisation organisations are included in this groups.
Programme governance	19	9	No change
ISA² action owners	23	15	No change
ISA² solution users	43	4	No change
Stakeholders involved in the implementation of linked EU policies/initiatives	10	9	No change
Standardisation organisations	5	-	The category "Standardisation organisations" is removed in the final evaluation due to a low number of received answers (2). Consequently, these answers are accounted for in the category "Experts and academia".
National/sub-national public authorities	-	15	The final evaluation features an additional stakeholder category of "National/sub-national public authorities". These represent stakeholders with a good knowledge of interoperability and the ISA ² programme who replied to the consultation activities. Given that the consultations supporting the ISA ² evaluation were conducted jointly with the consultations supporting the evaluation of the EIF and the impact assessment for a future interoperability policy for the EU's public sector, the consultations may have been reinforcing one another and thus attracting more stakeholders to contribute, in this case public authorities who may be primarily solutions users, but who have a good overview of the programme. By contrast, in the interim evaluation public administrations were mainly involved in the public consultation, did not exhibit the same level of knowledge and were therefore included in the group "Wider public". In addition, this category of stakeholders are key (potential) beneficiaries of the actions and solutions.
Wider public	29	36	All feedback received within the scope of the public consultation are assigned to the group "Wider public". However, in the final evaluation, due to difficulties encountered by some public authorities in responding to the targeted consultation within the given

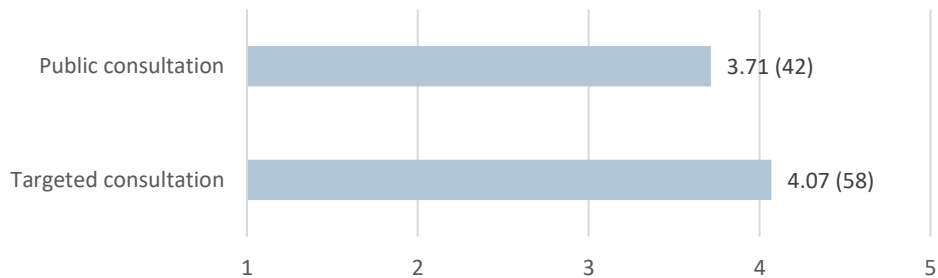
Stakeholder category	Interim evaluation	Final evaluation	Rationale supporting the differences in stakeholder groupings
			<p>timeframe, the responses provided by these actors in the public consultation have been further analysed in order to include them in the group that best reflects their role vis-à-vis the ISA² programme. In particular, the role of public authorities who responded that they had at least an average level of knowledge on the ISA² programme was reconsidered. In particular, the role of public authorities who responded that they had at least an average level of knowledge on the ISA² programme was reconsidered. Thus seven replies from public administrations to the public consultation (out of the total of 43 answers received to the public consultation) were counted as part of the national / sub-national public authorities group.</p>
TOTAL	129	102	

Source: Authors' elaboration.

Annex C Overview of stakeholder feedback by type of consultation

In this annex, the feedback received during the consultation activities are presented according to the type of consultation, i.e. public versus targeted consultation. Feedback received during in-depth interviews are grouped together with those from the targeted online survey since both consultation activities were based on the same questionnaire, only more qualitative feedback was sought in the in-depth interviews.

Figure 40 Knowledge of digital public services and interoperability (breakdown by type of consultation; average score and number of respondents)

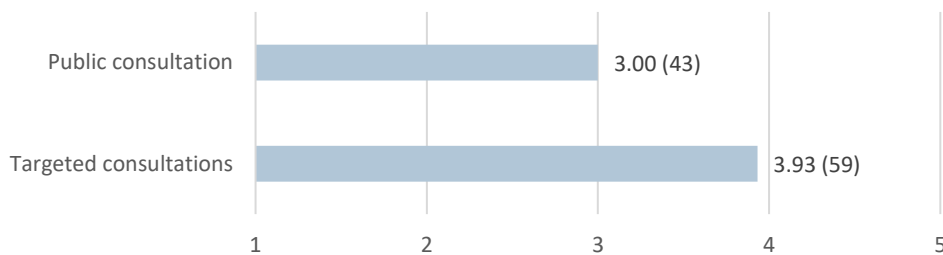


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 100.

Figure 41 Knowledge of ISA² (breakdown by type of consultation; average score and number of respondents)

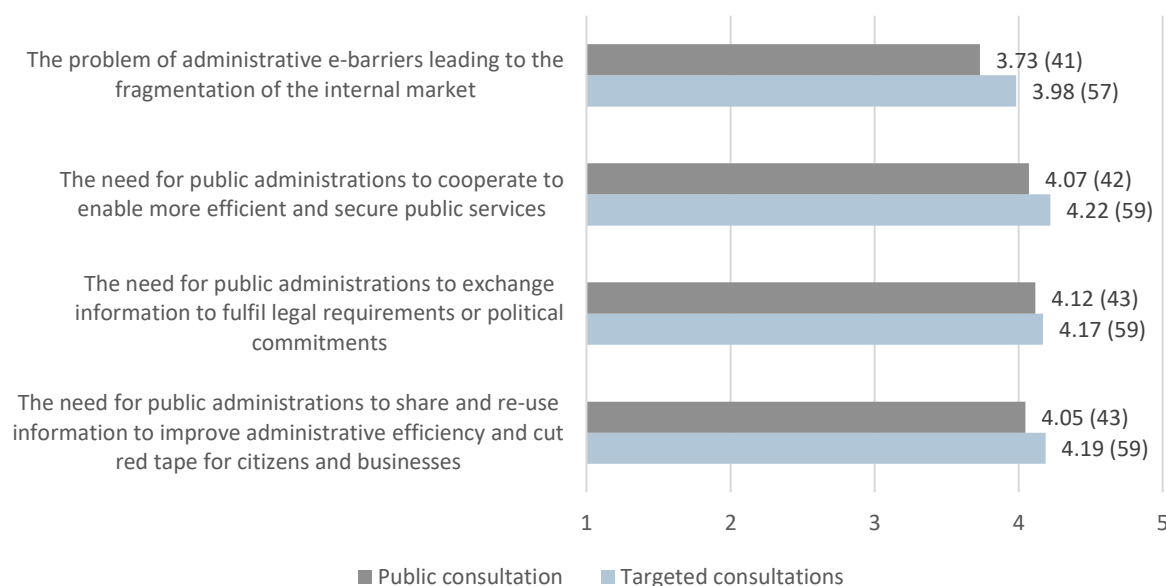


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 102.

Figure 42 Extent to which needs and problems originally addressed by ISA² are currently experienced by European public administrations, businesses and/or citizens (breakdown by type of consultation; average score and number of respondents)

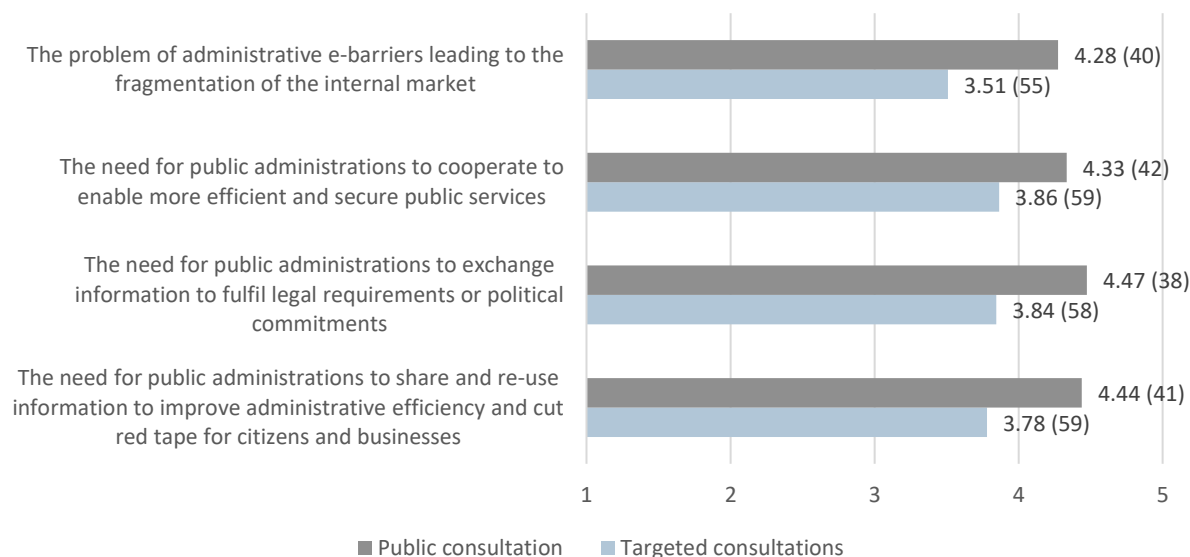


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents for each need and problem from top to bottom: 98, 101, 102, 102.

Figure 43 Extent to which achieving ISA² objectives contribute to addressing the needs and problems originally addressed by the programme (breakdown by type of consultation; average score and number of respondents)

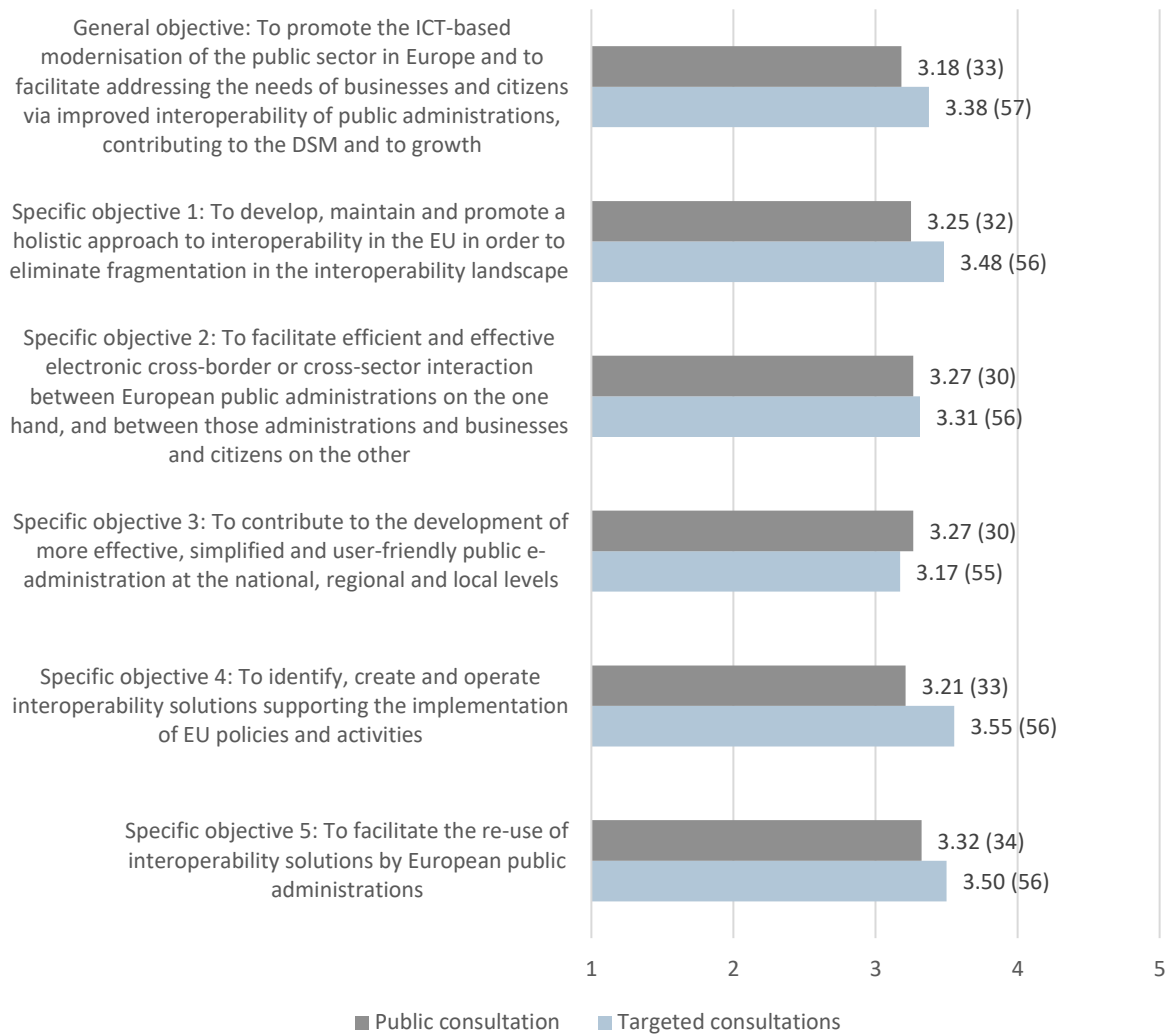


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 95, 101, 96, 100.

Figure 44 Extent to which ISA² solutions contributed to achieving the programme’s objectives (breakdown by type of consultation; average score and number of respondents)

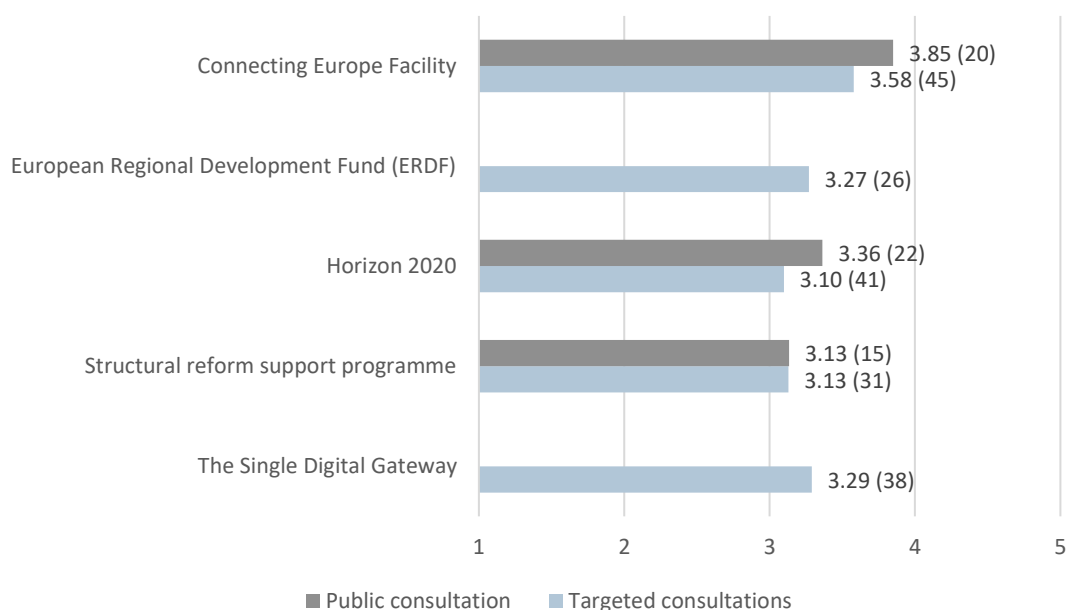


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

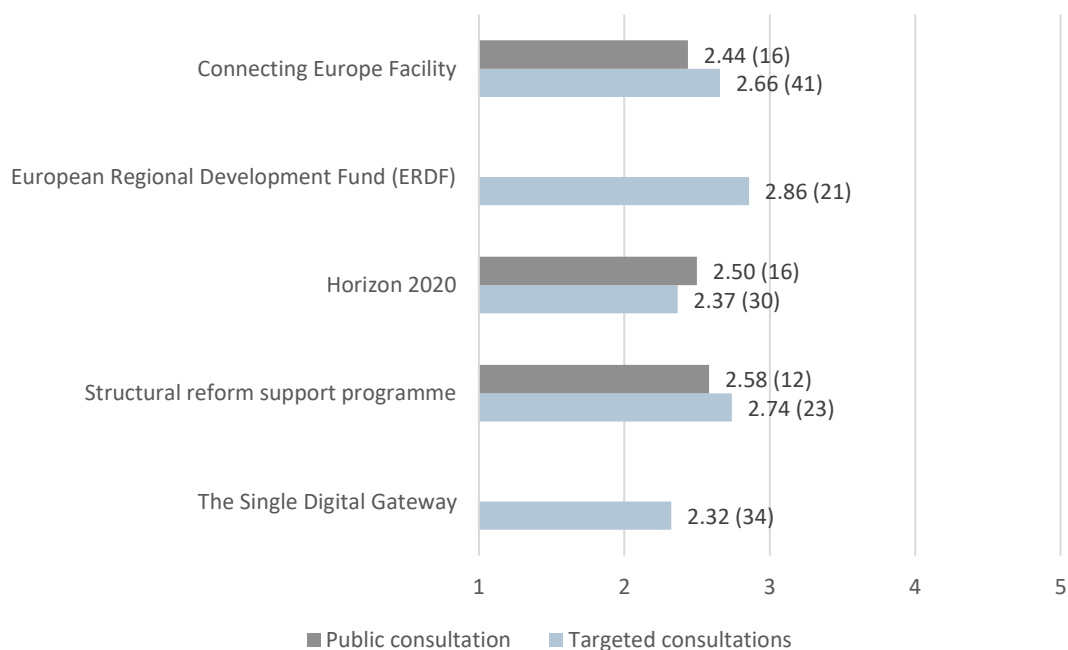
Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 90 (General objective), 88 (Specific objective 1), 86 (Specific objective 2), 85 (Specific objective 3), 89 (Specific objective 4), 90 (Specific objective 5).

Figure 45 Extent to which synergies between ISA² and other relevant EU programmes exist (average score and number of respondents)



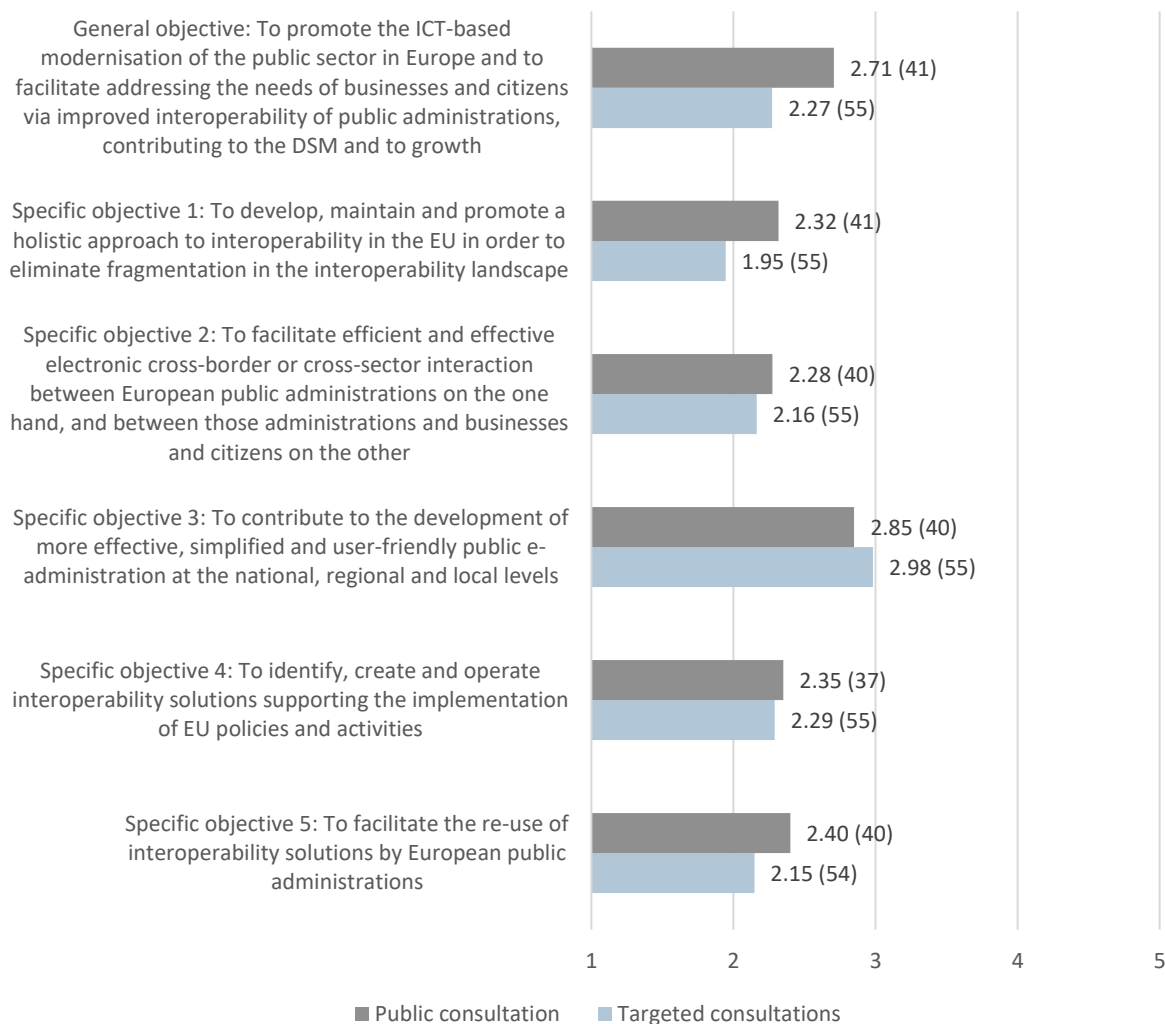
Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO). Only respondents to the targeted consultation have scored the ERDF and the Single reform support programme.
 Source: Authors' elaboration on data collected via consultation activities.

Figure 46 Extent to which overlaps between ISA² and other relevant EU programmes exist (average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO). Only respondents to the targeted consultation have scored the ERDF and the Single reform support programme.
 Source: Authors' elaboration on data collected via consultation activities.

Figure 47 Extent to which national or sub-national interventions would be able to achieve the ISA² objectives in the absence of the programme (breakdown by type of consultation; average score and number of respondents)

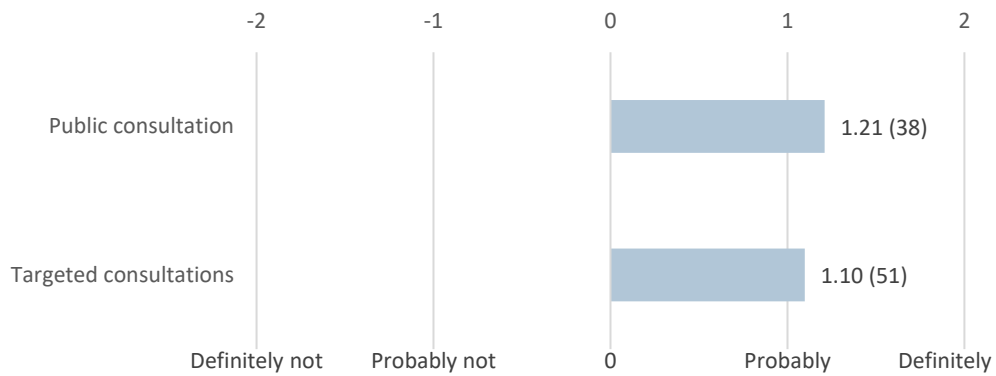


Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 96 (General objective), 96 (Specific objective 1), 95 (Specific objective 2), 95 (Specific objective 3), 92 (Specific objective 4), 94 (Specific objective 5).

Figure 48 Extent to which an EU-level intervention would be able to achieve the objectives of ISA² at a lower cost than comparable national or sub-national interventions (breakdown by type of consultation; average score and number of respondents)



Score: (-2) definitely would not; (-1) probably would not; (1) probably would; (2) definitely would;

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 89.

Annex D Factual summary of the public consultation

This annex presents the factual summary of the public consultation run as part of the final evaluation of the ISA² programme. The annex provides information on the categories of stakeholders participating in the public consultation and key feedback recorded through the public consultation.

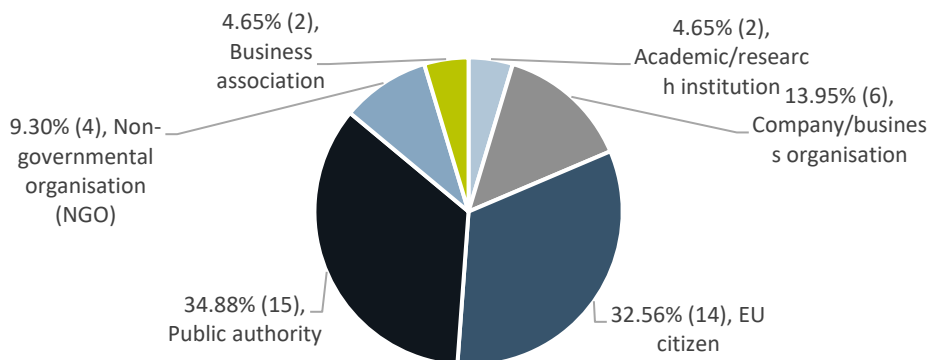
The 12-week long, Internet-based public consultation was open between 1 February and 26 April 2021. The underlying questionnaire was available in English, German, and French. The public consultation sought to gather the feedback of stakeholders on the relevance, effectiveness, coherence and EU added value of the programme.

A total of 43 responses were received concerning the final evaluation of ISA². Due to the limited number of answers and the particularities of ISA² stakeholders, the answers to the public consultation were grouped in the category "wider public", but a more detailed breakdown is provided below.

Background information on the respondents to the public consultation

The 43 respondents are divided across five categories (see Figure 49): public authorities (15 respondents), EU citizens (14 respondents), company / business organization (6 respondents), NGOs (4 respondents), business associations and academic / research institutions (each with 2 respondents).

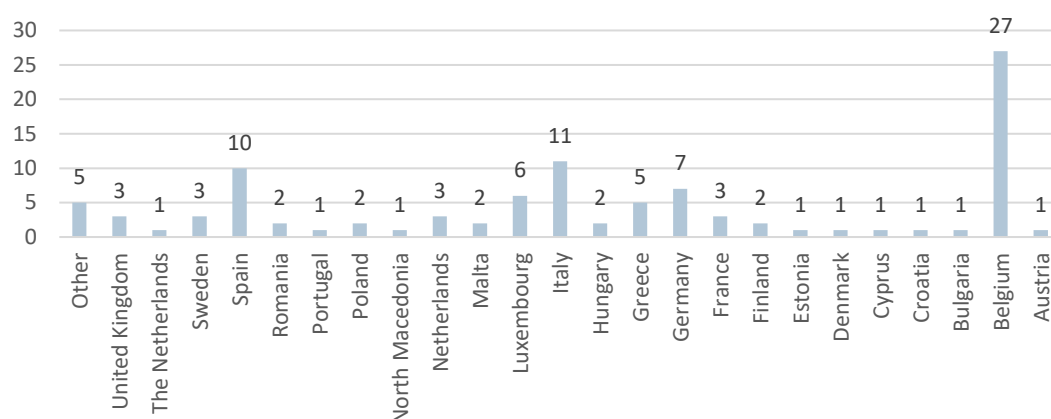
Figure 49 Categories of stakeholders (share of respondents and number of respondents in brackets)



Source: Authors' elaboration on data collected via consultation activities. Total number of respondents: 43.

In addition, the respondents are based in multiple countries across Europe (see Figure 50), with the majority of respondents concentrated in Spain (9), Belgium (7), Germany (5), and Italy (5).

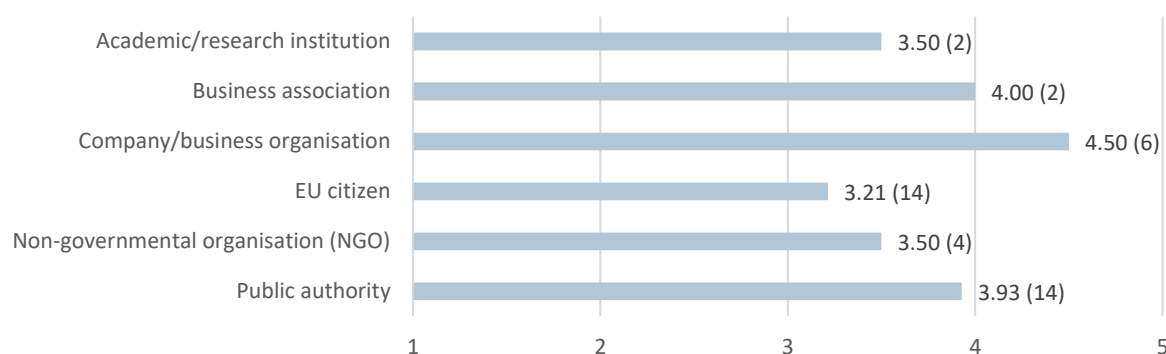
Figure 50 Countries (number of respondents)



Source: Authors' elaboration on data collected via the public consultation.

Finally, on average respondents across all stakeholder groups are familiar at least to some extent with the field of interoperability and digital public services (see Figure 51).

Figure 51 Level of familiarity with interoperability and digital public services (average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

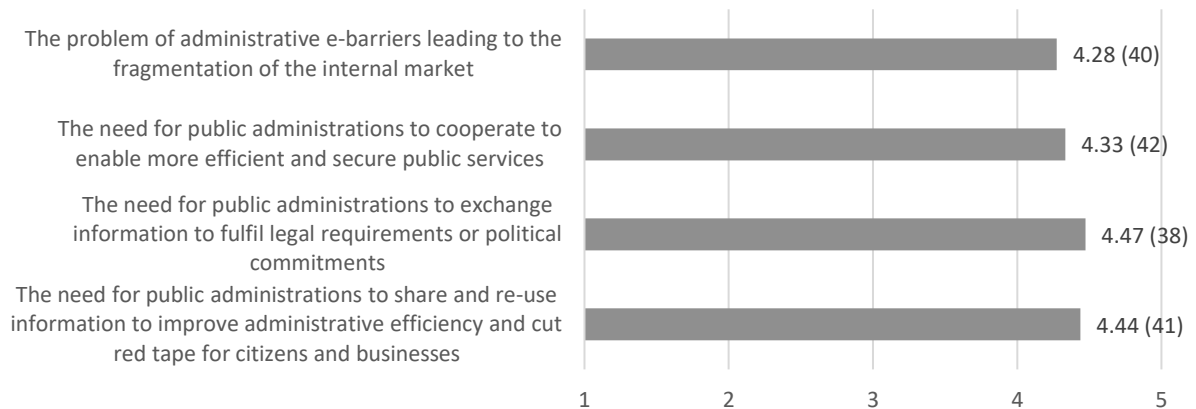
Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via the public consultation.

Key feedback to the public consultation

The stakeholders involved in the public consultation confirm the **relevance** of the programme with respects to the main needs and problems it has sought to address (Figure 52). In particular, consulted stakeholders confirm that the ISA² programme, through its objectives, contributes to addressing the *need for public administrations to exchange information to fulfill legal or political commitments* (with an average score of 4.47 out of 5 based on 38 answers). The objectives of ISA² are also highly relevant with respect to the *need for public administrations to share and re-use information to improve administrative efficiency and cut red tape for citizens and businesses* (with an average score of 4.44 out of 5 based on 41 answers).

Figure 52 Extent to which achieving ISA² objectives contribute to addressing the needs and problems originally addressed by the programme (average score of answers, number of respondents)



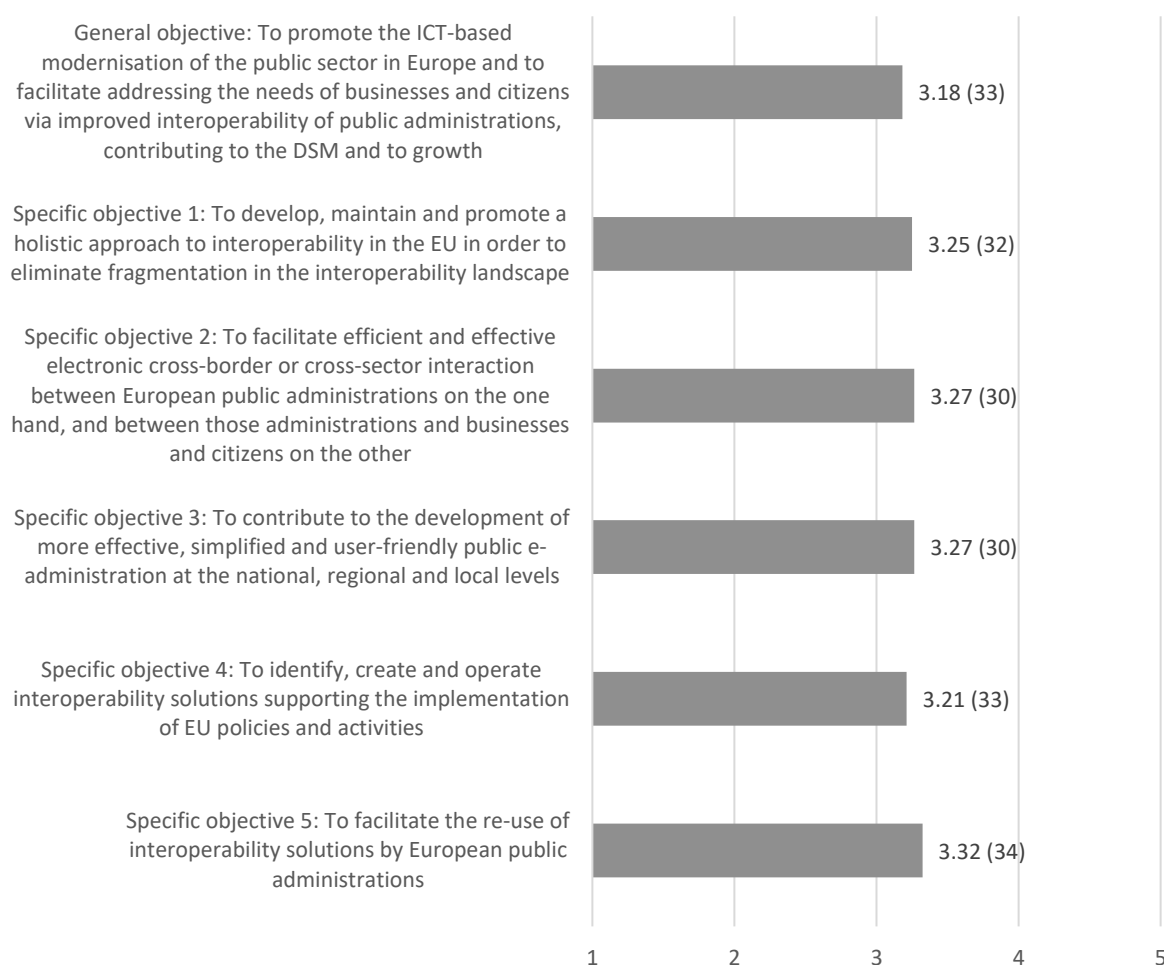
Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via the public consultation.

In terms of its effectiveness, on average the stakeholders consulted during the public consultation consider that ISA² solutions contribute to some extent to achieving the general and specific objectives of the programme (Figure 53). All general and specific objectives received similar scores from the consulted stakeholders, with the averages ranging between 3.18 out of 5 based on 33 answers for the general objective ("To promote the ICT-based modernisation of the public sector in Europe and to facilitate addressing the needs of businesses and citizens via improved interoperability of public administrations, contributing to the DSM and to growth") and 3.32 out of 5 based on 34 answers for specific objective 5 ("To facilitate the re-use of interoperability solutions by European public administrations")

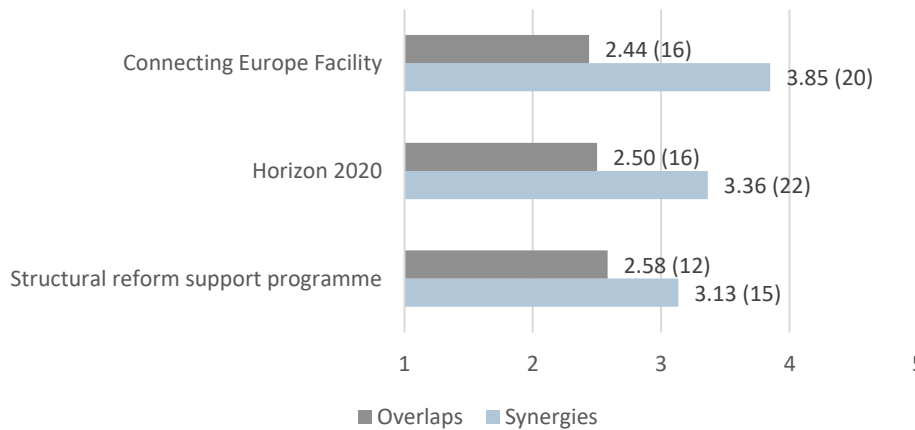
Figure 53 Extent to which ISA² solutions contributed to achieving the programme’s objectives (breakdown by group of stakeholders; average score and number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.
 Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).
 Source: Authors' elaboration on data collected via the public consultation.

Concerning the **coherence** of the programme with other EU initiatives in the field of public sector digitalisation (Figure 54), a fraction of the participants in the public consultation identify synergies to a high extent with the CEF (with an average score of answers of 3.85 out of 5 based on 20 answers), and synergies to a lesser extent with Horizon 2020 (with an average score of answers of 3.36 out of 5 based on 22 answers) and the SDG (with an average score of answers of 3.13 out of 5 based on 15 answers). At the same time, respondents consider that some overlaps may also exist, in particular with the Structural Reform and Support Programme (with an average score of answers of 2.58 out of 5 based on 12 answers).

Figure 54 Synergies and overlaps between ISA² and selected programmes in the field of public sector digitalization (average score of answers, number of respondents)



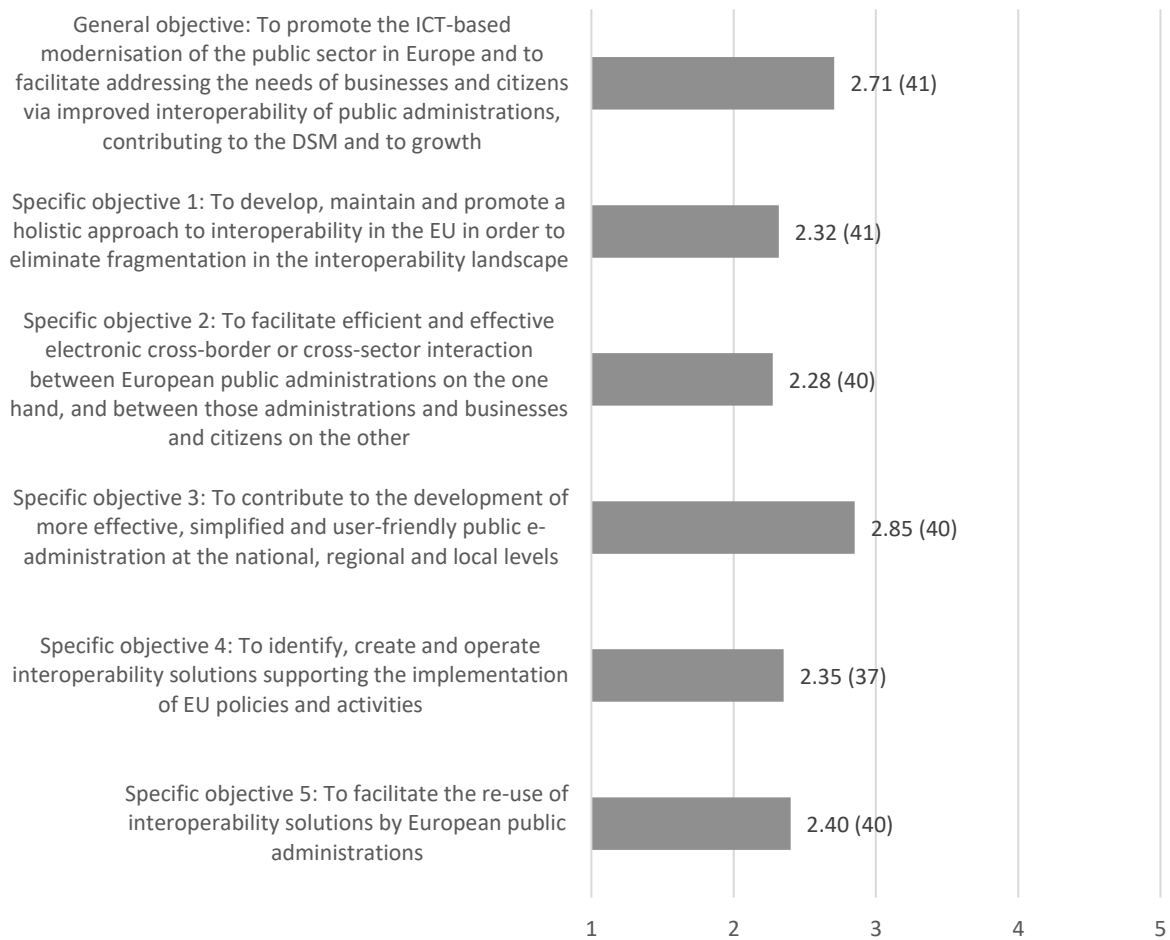
Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via the public consultation.

Finally, when it comes to the EU added value of the programme, the respondents to the public consultation consider that national or sub-national interventions would be able to a limited extent to achieve the ISA² objectives in the absence of ISA² (Figure 55). This is particularly reflected in the feedback for specific objective 2 (with an average of 2.28 out of 5 based on 40 replies to the public consultation). Consulted stakeholders consider that national and or sub-national interventions may be able to achieve to some extent specific objective 3 (with an average of 2.85 out of 5 based on 40 replies to the public consultation).

Figure 55 Extent to which national or sub-national interventions would be able to achieve the ISA² objectives in the absence of the programme (average score of answers, number of respondents)



Score: (1) not at all; (2) to a limited extent; (3) to some extent; (4) to a great extent; or (5) completely.

Note: Averages do not account for respondents answering "don't know/no opinion" (DK/NO).

Source: Authors' elaboration on data collected via the public consultation.

Annex E Intervention logic of the ISA² programme

This Annex presents the **intervention logic of ISA²**, detailing the rationale, the inputs, and the expected results of the programme at the time of its enactment. The Annex is entirely based on the Interim Evaluation of the ISA² programme performed by CEPS and published in 2019, following its approval by the European Commission.⁸⁵ The decision to rely on the same intervention logic on which the Interim Evaluation was based is essential for two main reasons.

- This approach ensures full comparability between the findings of the Final Evaluation and Interim Evaluation of ISA²;
- This is the best approach from a methodological standpoint, as the intervention logic aims to clarify the logic followed by EU decision-makers back in 2015, when establishing the ISA² programme, and this ex ante perspective does not allow to modify the intervention logic used for the Interim Evaluation of ISA².

The intervention logic of ISA² includes a detailed description of the **needs, problems and drivers** that the programme intended to address, the **objectives** set out for the programme (following a three-level hierarchy: global objective, specific objectives and operational objectives), the **activities** of the programme, the **expected outputs, outcomes and impacts** of the programme and the logical links between these components.

The rationale for the intervention: "why did the EU establish the ISA² programme?"

Needs and Problems⁸⁶

The DSM Strategy⁸⁷ recognised interoperability as a prerequisite for "*efficient connections across borders, between communities and between public services and authorities*". Moreover, as the Digital Agenda for Europe⁸⁸ highlighted, interoperability plays a key role in maximising the social and economic potential of ICT. Against this background, **three specific needs** can be identified in the field of interoperability⁸⁹:

- The need for cooperation among public administrations with the aim to enable more efficient and secure public services;
- The need for exchanging information among public administrations to fulfil legal requirements or political commitments; and
- The need for sharing and reusing information among public administrations to increase administrative efficiency and cut red tape for citizens and businesses.

When it comes to **problems**, the ISA² Proposal outlined one main issue, namely the existence of administrative e-barriers leading to a fragmented market.⁹⁰

⁸⁵ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission.

⁸⁶ Needs refer to prerequisites for the efficient delivery of European public services, more specifically in terms of the interoperability dimension. Problems consist of specific bottlenecks that hinder the realisation of the needs. The drivers are the underlying causes that lead to the identified problem.

⁸⁷ European Commission (2015), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A Digital Single Market Strategy for Europe", COM(2015) 192 final

⁸⁸ European Commission (2010), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "A Digital Agenda for Europe", COM(2010)245 final.

⁸⁹ European Commission (2010), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "Towards interoperability for European public services" and "Annex II – EIF (European Interoperability Framework)", COM(2010) 744 final.

⁹⁰ See Section 1.2 of the ISA² Proposal.

This particular problem is affected by **eight drivers** (as pointed out in a series of documents: the ISA² Proposal, the Final Evaluation of the ISA programme,⁹¹ the Commission Staff Working Document accompanying the DSM Strategy⁹²):

- Limited governance and coordination among Commission DGs and between Member States and the Commission on programmes and initiatives related to interoperability;
- Limited cooperation among dispersed institutional entities;
- Resource constraints in relation to interoperability;
- Internal organisational complexity;
- Limited ICT architectures and tools enabling interoperability;
- Limited availability of common frameworks, guidelines, and specifications;
- Limited awareness of the benefits of interoperability; and
- Cultural fragmentation.⁹³

Objectives

The objectives of the ISA² are presented in a **hierarchical order**, where the achievement of lower-level objectives is normally a pre-condition for attaining the higher-level ones. In this respect, three levels of objectives have been identified:

- General objectives, concerning the overall rationale of an intervention and its longer-term and more diffused effects, i.e. pertaining to the questions: “why has the ISA² programme been set up?” and “what ultimate goal was it expected to contribute to?”;
- Specific objectives, providing a basis for assessing an intervention in relation to the short-term or medium-term results that occur at the level of direct beneficiaries/recipients of the intervention; and
- Operational objectives, providing a basis for assessing an intervention in relation to its direct outputs, i.e. “what is directly produced/supplied during the ISA² programme’s implementation?”.

Based on the ISA² Proposal and the ISA² Decision, the three levels of objectives have been identified.

General objective:

- To promote the ICT-based modernisation of the public sector in Europe and to facilitate addressing the needs of businesses and citizens via improved interoperability of European public administrations, thus contributing to the completion of the DSM and, ultimately, to economic growth and the global competitiveness of the EU.⁹⁴

Specific objectives:

⁹¹ Kurt Salmon, KPMG (2015), Final evaluation of the ISA programme, Final report v2.06, 1 December 2015.

⁹² European Commission (2015), Commission Staff Working Document “A Digital Single Market Strategy for Europe – Analysis and Evidence” Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “A Digital Single Market Strategy for Europe”, SWD(2015) 100 final.

⁹³ National administrative systems are often characterised by different administrative cultures, which include the beliefs and values on the role of the State and its civil servants. As pointed out by a recent Study published by the Commission, although European public administrations share the values associated with democracy and the rule of law, national administrative cultures show clear differences (Thijs N., Hammerschmid G., Palaric E. (2017), A comparative overview of public administration characteristics and performance in EU28, European Commission).

⁹⁴ See recitals 34, 36 and 45 of the ISA² Decision and Section 1.1 of the ISA² Proposal.

- **Specific objective #1:** To develop, maintain and promote a holistic approach to interoperability in the EU in order to eliminate fragmentation in the interoperability landscape in the Union (Article 1(a) of the ISA² Decision).
- **Specific objective #2:** To facilitate efficient and effective electronic cross-border or cross-sector interaction between European public administrations on the one hand, and between European public administrations and businesses and citizens on the other (Article 1(b) of the ISA² Decision).
- **Specific objective #3:** To contribute to the development of a more effective, simplified and user-friendly e-administration at the national, regional and local levels of public administration (Article 1(b) of the ISA² Decision).
- **Specific objective #4:** To identify, create and operate interoperability solutions supporting the implementation of Union policies and activities (Article 1(c) of the ISA² Decision).
- **Specific objective #5:** To facilitate the re-use of interoperability solutions by European public administrations (Article 1(d) of the ISA² Decision).

The **operational objectives** of the ISA² programme are listed in the first column of the following table. The additional columns are relevant for the expected results of the programme (see below for further details).

Table 11 Overview of operational objectives and expected outputs of the ISA² programme

Operational objectives	Expected outputs	Performance indicators
Operational objective (1): To support and promote the assessment, improvement, operation and re-use of existing cross-border or cross-sector interoperability solutions and common frameworks (Article 3 (a) of the ISA ² Decision)	<ul style="list-style-type: none"> • Re-use of interoperable solutions and common frameworks • Re-use of best practices • Continuity in the delivery of interoperable solutions • Professional delivery of a coherent portfolio of interoperable solutions and common frameworks for European public administrations • Improved services and infrastructures • Improved tools • Continuity in the tools provision 	<ul style="list-style-type: none"> • Number of common services and generic tools used by European public administrations • Adoption of common frameworks by European public administrations • Users uptake • Users' satisfaction • Number of new sectors covered by existing solutions (cross-sector / cross-border dimension)
Operational objective (2): To support and promote the development, establishment, bringing to maturity, operation and re-use of new cross-border or cross-sector interoperability solutions and common frameworks (Article 3 (b) of the ISA ² Decision)	<ul style="list-style-type: none"> • Increased re-use of existing components in the development of new interoperable solutions and common frameworks • Increased availability of services and common frameworks that meet the needs of sectors and Member States • Delivery of new services and common frameworks in time • Increased availability of tools that meet the needs of sectors and Member States • Delivery of new tools in time 	<ul style="list-style-type: none"> • Number of new common services and generic tools by European public administrations • Adoption of new common frameworks by European public administrations
Operational objective (3): To support and promote the assessment of the ICT implications of proposed or adopted Union law (Article 3 (c) of the ISA ² Decision)	<ul style="list-style-type: none"> • Smooth implementation of EU legislation • Identification of the needs for services and tools in time so that requirements are fulfilled when the legislation comes into force • Understanding of ICT dimensions of EU policies 	<ul style="list-style-type: none"> • Number of pieces of legislation reviewed • Number of assessments of ICT implications of new EU legislation conducted
Operational objective (4): To support and promote the identification of legislation gaps, at Union and national level, that hamper cross-	<ul style="list-style-type: none"> • A defined role and process for the ISA² programme to support the DGs and services undertaking assessments of ICT implications of new EU legislation as part of the 	<ul style="list-style-type: none"> • Number of instances where ISA² is involved (e.g. participation of ISA² in evaluations, impact

Operational objectives	Expected outputs	Performance indicators
border or cross-sector interoperability between European public administrations (Article 3 (d) of the ISA ² Decision)	<p>Commission's Impact Assessment process (Better Regulation Guidelines)⁹⁵</p> <ul style="list-style-type: none"> • Identification and resolution of legislation gaps that hamper cross-border or cross-sector interoperability between European public administrations 	<p>assessments, and REFIT of EU legislation)</p> <ul style="list-style-type: none"> • Number of pieces of gaps identified
Operational objective (5): To support and promote the development of mechanisms that measure and quantify the benefits of interoperability solutions including methodologies for assessing cost-savings (Article 3 (e) of the ISA ² Decision)	<ul style="list-style-type: none"> • Functioning mechanisms to promote the use and monitor the adoption of interoperability solutions as well as their numbers of users • Cost/benefit model/methodology available for assessing cost-savings based on the study related to the cost-benefit of interoperability. 	<ul style="list-style-type: none"> • Usage of the Cost/Benefit model to produce figures to show the value of interoperability.
Operational objective (6): To support and promote the mapping and analysis of the overall interoperability landscape in the Union through the establishment, maintenance and improvement of the EIRA and the EIC as instruments to facilitate the re-use of existing interoperability solutions and to identify the areas where such solutions are still lacking (Article 3 (f) of the ISA ² Decision)	<ul style="list-style-type: none"> • Existing interoperability solutions documented within the EIC (EICart) applying the principles and guidelines from the EIRA • EIRA used by European public administrations • EIC/EICart facilitating the deployment of interoperable solutions within and between European public administrations 	<ul style="list-style-type: none"> • Usage of EIRA by European public administrations • Usage of EIC/EICart by European public administrations • Number of references in implementations of interoperable solutions • Number of interoperable solutions documented in the EIC/EICart
Operational objective (7): To support and promote the maintenance, updating, promotion and monitoring of the implementation of the European Interoperability Strategy (EIS), the EIF and the EIRA (Article 3 (g) of the ISA ² Decision)	<ul style="list-style-type: none"> • Interoperable solutions developed in the frame of ISA² that take into account EIF and EIRA • Interoperable solutions developed by other Commission DGs that take into account EIF and EIRA • ISA² actions implementing the priorities/actions set by the EIS 	<ul style="list-style-type: none"> • Usage of EIRA by European public administrations • Number of EIS priorities implemented by European public administrations • Level of implementation of the EIF at national and Commission level
Operational objective (8): To support and promote the assessment, updating and promotion of existing common specifications and standards and the development, establishment and promotion of new common specifications and open specifications and standards through the Union's standardisation platforms and in cooperation with European or international standardisation organisations as appropriate (Article 3 (h) of the ISA ² Decision)	<ul style="list-style-type: none"> • Adoption of 'standardised' specific outputs from previous programme (e.g. Core Vocabularies, ADMS) by European public administrations. • Standards, open specifications and assessment procedures aligned with Member States • International/European recognition of standards and open specifications • Established new standards and open specifications • Alignment of standards with EU standardisation platforms 	<ul style="list-style-type: none"> • Number of new or revised standards used by European public administrations • Number of new or revised common specifications and open specifications used by European public administrations • Number of assessments (e.g. through multi-stakeholder platform or CAMMS)
Operational objective (9): To support and promote the maintenance and publication of a platform allowing access to, and collaboration with regard to, best practices, functioning as a means of raising awareness and disseminating available solutions, including security and safety frameworks, and helping to avoid duplication of efforts while encouraging the re-usability of solutions and standards (Article 3 (i) of the ISA ² Decision)	<ul style="list-style-type: none"> • All existing ready-for-use interoperable and best practice solutions are documented in and accessible via Joinup⁹⁶ to raise awareness and avoid duplication of efforts among stakeholders 	<ul style="list-style-type: none"> • Number of ready-for-use interoperable and best practice solutions housed in Joinup
Operational objective (10):	<ul style="list-style-type: none"> • Continued development and interim operation of ISA solutions, e.g. 	<ul style="list-style-type: none"> • Number of new interoperability services and

⁹⁵ European Commission (2017), Better Regulation Guidelines, SWD(2017) 350, Brussels, 7 July 2017.

⁹⁶ For further details see: <https://joinup.ec.europa.eu/>

Operational objectives	Expected outputs	Performance indicators
To support and promote the bringing of new interoperability services and tools to maturity, and maintaining and operating existing interoperability services and tools on an interim basis (Article 3 (j) of the ISA ² Decision)	sTESTA, with a view to achieving longer-term sustainable financing and operational governance structures	<ul style="list-style-type: none"> tools developed, maintained and operated by ISA² Number of new interoperability services brought to maturity
Operational objective (11): To support and promote the identification and promotion of best practices, to develop guidelines to coordinate interoperability initiatives and to animate and support communities working on issues relevant to the area of electronic cross-border or cross-sector interaction between end-users (Article 3 (k) of the ISA ² Decision)	<ul style="list-style-type: none"> Continued use of Joinup to house ready-for-use interoperable and best practice solutions to promote interoperability Enhanced coordination, notably, through the Interservice Group on Public Administration Quality and Innovation and also in publications, such as the NIFO and eGovernment factsheets 	<ul style="list-style-type: none"> Number of ready-for-use interoperable and best practice solutions housed in Joinup Number of joint initiatives (studies etc.) in interoperability by EU-wide groups, such as the Commission's Interservice Group on Public Administration Quality and Innovation Number of joint publications
Operational objective (12): To develop a communication strategy [...], aiming to enhance information and increase awareness with regard to the ISA ² programme and its benefits, targeting businesses, including SMEs, and citizens, and employing user-friendly means on the ISA ² programme's website (Article 3 of the ISA ² Decision)	<ul style="list-style-type: none"> An updated Communication Strategy with clear stakeholder, monitoring and measurement targets 	<ul style="list-style-type: none"> Monitoring and measurement of the Communication Strategy (events, satisfaction surveys, publications) Numbers of stakeholders engaged in different events, actions, initiatives etc.

Source: Authors' own elaboration on the ex-ante evaluation of ISA² (Kurt Salmon (2015), Final evaluation of the ISA programme – Ex-ante evaluation of ISA²).

The intervention: "what actions are supported by the ISA² programme?"

This Section focuses on the means used by the programme to address the needs and problems and to achieve the objectives identified in the intervention logic. In this context, these means largely correspond to the **actions of the ISA² programme**, as defined in the [ISA² Rolling Work Programme](#). The ISA² actions are grouped into nine packages as outlined below.

- **Key and generic interoperability enablers** are actions that develop interoperability solutions to support public administrations in providing services, ranging from the secure exchange of files to improving cross-border access to government data and information. Examples include [TESTA](#) and [Open e-TrustEx](#).
- **The semantic interoperability package** consists of initiatives to establish and enhance semantic interoperability among public administrations through information standards and specifications. Examples include [Core Vocabularies](#) and [DCAT Application Profile](#) for data portals in Europe.
- Under the **access to data/data sharing/open data package**, the ISA² programme funds actions that help facilitate the re-use of national data repositories, data across borders and sectors and widen access to data created by the public sector. Examples include "[Providing big data opportunities for public administrations](#)" and "[FISMA: Financial Data Standardisation](#)".
- **The geospatial solutions package** consists of legal/policy, organisational, semantic and technical interoperability solutions that aim to facilitate efficient and effective electronic cross-border and cross-sector interaction between European public administrations, and between administrations and citizens and companies, in the field of location information and services. This package led to the [Re3gistry](#) solution.
- **The eProcurement/eInvoicing package** helps update and improve existing EU tools for e-procurement. It aims to develop a common public procurement

knowledge base to facilitate the creation, exchange, dissemination and re-use of procurement data. Examples include [Open e-Prior](#), [ESPD](#), and [eCertis](#).

- **The decision-making and legislation package** covers actions that support the decision-making process, particularly by enhancing interoperability between EU institutions and between them and the Member States. These actions address several processes – ranging from the collection of feedback provided by various stakeholders to the drafting of new legislation and monitoring that this legislation is implemented. The package led to the [LEOS](#) solution.
- **The EU policies – supporting instruments package** covers actions that support the implementation of EU policies for which interoperability aspects need to be considered. The package led to the Online Collection Software to support [European Citizens' Initiatives](#).
- **The supporting instruments for public administrations package** map the interoperability landscape in the EU and provides support solutions for enhancing interoperability, ranging from sharing best practices to supporting the re-use of solutions. Examples include the [Interoperability Academy](#), [EUSurvey](#), [Joinup – European Collaborative Platform and Catalogue](#), and the [NIFO](#).
- **The accompanying measures package** consists of activities related to raising awareness of interoperability and monitoring and evaluating the programme implementation. Examples include the annual [SEMIC Conference](#), the [ISA² Mid-Term Conference](#), the [DigitALL conference](#) and the [ISA² Dashboard](#).

The expected results of the intervention: "what are the expected effects of the actions supported by the ISA² programme?"

At the time of enactment, the ISA² programme was expected to generate certain effects (i.e. to cause changes) on certain categories of stakeholders. These **effects** can be **classified into three different categories** (i.e. outputs, outcomes and impacts) based on the timeframe of their occurrence and the groups of addressees involved. It is worth noting that **external factors and other EU policies** may influence the performance of the ISA² programme.

Outputs (expected)

The outputs of the ISA² programme are its **most immediate effects**, i.e. the deliverables/products of the funded actions. As the intervention logic looks at a certain intervention by simulating an *ex ante* perspective, it is necessary to identify the outputs that were expected to result from the programme when it was initially adopted. It needs to be emphasised that expected outputs usually reflect the operational objectives identified in previous analytical steps. In this respect, the expected outputs and related indicators are listed in the ex-ante evaluation of ISA².⁹⁷ Table 11 above summarises the expected outcomes and a series of key performance indicators related to each operational objective of the ISA² programme.

Outcomes (expected)

The outcomes represent the **short-term and medium-term changes that occur at the level of the direct addressees of the programme**. Outcomes are usually connected to the specific objectives; therefore, they can be summarised as the following:

- A coherent interoperability landscape in the Union based on a holistic approach to interoperability;
- Efficient and effective electronic cross-border or cross-sectoral interactions between European public administrations as well as between European public administrations and businesses/citizens;

⁹⁷ Kurt Salmon (2015), Final evaluation of the ISA programme – Ex-ante evaluation of ISA².

- More effective, simplified and user-friendly e-administrations in European public administrations;
- Advancement of Union policies and activities by supporting their implementation;
- Take-up and re-use of the ISA² programme's results by European public administrations.

Impacts (expected)

As mentioned above, the intervention logic also includes the so-called **impacts**, i.e. the changes caused by an EU intervention **over a longer period** and also **affecting the entire society** rather than only the direct addressees of the intervention itself. These changes are related to the general objectives of a certain intervention. By analysing the ISA² Decision and the ISA² Proposal, the following expected impacts can be identified:

- Increasing the speed, efficiency and quality in the creation and delivery of cross-border and cross-sector electronic public services to meet the needs of businesses and citizens;
- Improving the efficiency and productivity of the European public administrations, which can be a strong driver of economic growth through their support for, and governance of, the private sector;
- Reducing costs and administrative burdens of cross-border interactions, removing administrative e-barriers and contributing to the swift implementation of ICT systems supporting EU legislation;
- Contributing to the successful achievement of the DSM.

Annex F Evaluation framework for the final evaluation of ISA²

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
Evaluation criterion #1: Relevance				
<p>1. To what extent are the objectives of the ISA² programme still pertinent in relation to the evolving needs and problems at both national and EU levels?</p>	<ul style="list-style-type: none"> • Degree of alignment between stakeholders' perception of needs and problems at national and sub-national levels and the objectives of the programme. • Degree of alignment between stakeholders' perception of needs and problems at EU level and the objectives of the programme. • Degree of alignment between needs and problems originally addressed by the programme and stakeholders' perception of needs and problems. 	<ul style="list-style-type: none"> • Share of stakeholders confirming the alignment between needs and problems addressed by the programme and current needs and problems. • Share of stakeholders confirming the alignment between the objectives of the programme and current needs and problems at national and sub-national levels. • Share of stakeholders confirming the alignment between the objectives of the programme and current needs and problems at EU level. • Qualitative assessment of the alignment between the objectives of the programme and current needs and problems. • Qualitative assessment of the alignment between needs and problems addressed by the programme and current needs and problems. 	<ul style="list-style-type: none"> • Primary information on needs and problems from the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked EU policies/initiatives. ○ Standardisation organisations. ○ Experts. ○ Indirect beneficiaries and wider public (optional). • Secondary information on needs and problems from operational documents, other official documents and relevant literature, such as: <ul style="list-style-type: none"> ○ ISA² Decision and accompanying documents. ○ ISA² Rolling Work Programme. ○ eGovernment/Digital government factsheets. ○ Study on the role of eGovernment and interoperability in the European Semester. ○ State of Play of Interoperability in Europe. ○ Data on the digital economy from Eurostat. ○ Mid-term review of the DSM Strategy. ○ Interim Evaluation of ISA². 	<ul style="list-style-type: none"> • Desk research. • Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked EU policies/initiatives. • Online surveys/written questionnaires targeted to the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked policies/initiatives. ○ Standardisation organisations. • Public consultation (optional). • Quantitative assessment of responses to interviews and surveys (Likert scale). • Qualitative assessment of responses to interviews and surveys and data and information collected via desk research. • Expert assessment.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
Evaluation criterion #2: Effectiveness				
<p>2. To what extent has the ISA² programme achieved its objectives – with special focus on the re-use of interoperability solutions across the Union and paying particular attention to the needs expressed by the European public administrations?</p> <p>3. Are there aspects (e.g. objectives, actions) that are more or less effective than others, and if so, what lessons can be drawn from this?</p>	<ul style="list-style-type: none"> Degree of alignment between actual and expected results and 	<ul style="list-style-type: none"> Share of stakeholders confirming the alignment between actual and expected results of ISA². Share of stakeholders confirming the alignment between the objectives and actual results of ISA². Share of stakeholders who are aware of ISA². Share of stakeholders identifying external factors contributing to/jeopardising the performance of ISA². Share of stakeholders who are aware of specific ISA² packages/ actions/ solutions. Qualitative assessment of the alignment between objectives, expected and actual results of ISA². Quantitative assessment of performance indicators of outputs. Qualitative assessment of the alignment with principles spelled out in Article 4 of the ISA² Decision. 	<ul style="list-style-type: none"> Primary information actual results and contribution to the programme's objectives from the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Standardisation organisations. Experts. Indirect beneficiaries and wider public (optional). Secondary information from operational documents and other official documents, such as: <ul style="list-style-type: none"> ISA² Rolling Work Programme ISA² Annual Monitoring and Evaluation Reports. ISA² Quarterly Monitoring Reports. ISA² Dashboard. Documentary evidence on funded actions (e.g. deliverables, final reports). Interim Evaluation of ISA². 	<ul style="list-style-type: none"> Desk research. Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Online surveys/written questionnaires targeted to the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Standardisation organisations. Success stories/lessons learnt. Public consultation (optional). Quantitative assessment of responses to interviews and surveys (Likert scale). Qualitative assessment of responses to interviews and surveys and data and information collected via desk research. Multicriteria analysis. Expert assessment.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
	<p>objectives of the programme.⁹⁸</p> <ul style="list-style-type: none"> • Impact of external factors on the performance of the programme. • Measurement of the indicators summarising the outputs of the programme. • Degree of alignment with principles spelled out in Article 4 of the ISA² Decision. • Awareness of the programme. 			

⁹⁸ Results include outputs, outcomes, and impacts, with the caveat that impacts are longer-term results that may only become noticeable after a more significant period of time.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
Evaluation criterion #3: Efficiency				
<p>4. To what extent has the programme been cost-effective?</p> <ul style="list-style-type: none"> ○ How is the programme performing relative to the planned work and budget? <p>5. Which aspects of the programme are the most efficient or inefficient, especially in terms of resources mobilised?</p>	<ul style="list-style-type: none"> • Cost-effectiveness analysis to assess the ratio between allocated funds and actual results of the programme. • Earned value management analysis. • Efficiency of the selection process of the actions to be included in the Rolling Work Programme. 	<ul style="list-style-type: none"> • Comparison between the costs of ISA² packages and the results measured via performance indicators. • Earned Value, Actual Costs, Planned Value, and Schedule Performance Index of ISA² packages.⁹⁹ • Share of stakeholders confirming that the selection process of the actions is fit-for-purpose. • Assessment of regulatory costs linked to the selection process of the actions included in the Rolling Work Programme. 	<ul style="list-style-type: none"> • Primary information on costs from the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. • Secondary information from operational documents and other official documents, such as: <ul style="list-style-type: none"> ○ ISA² Rolling Work Programme. ○ ISA² Annual Monitoring and Evaluation Reports. ○ ISA² Quarterly Monitoring Reports. ○ ISA² Dashboard. ○ Documentary evidence on funded actions (e.g. deliverables, final reports). ○ Interim Evaluation of ISA². 	<ul style="list-style-type: none"> • Desk research. • Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. • Online surveys/written questionnaires targeted to the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. • Success stories/lessons learnt. • Quantitative assessment of responses to surveys (Likert Scale). • Qualitative assessment of responses to interviews and surveys and data and information collected via desk research. • Cost-effectiveness analysis. • Standard cost model. • Earned value management.
Evaluation criterion #4: Coherence				
<p>6. To what extent do the ISA² actions form part of a "holistic" approach within the framework of the programme? (<u>internal coherence</u>)</p> <p>7. To what extent is the ISA² programme coherent with other EU interventions</p>	<ul style="list-style-type: none"> • Degree of coherence among actions funded by the ISA² programme (internal coherence). • Degree of coherence between the programme and other EU supported programmes (external coherence). <ul style="list-style-type: none"> ○ Focus on CEF, SRSP, Horizon 2020. 	<ul style="list-style-type: none"> • Share of stakeholders identifying synergies/overlaps between funded actions. • Share of stakeholders identifying synergies/overlaps between the programme and other relevant EU programmes/policies. • Qualitative assessment of synergies/overlaps and links between funded actions. 	<ul style="list-style-type: none"> • Primary information on internal coherence from the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Experts. • Primary information on external coherence from the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². 	<ul style="list-style-type: none"> • Desk research. • Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked EU policies/initiatives. • Online surveys/written questionnaires targeted to the

⁹⁹ The efficiency of the funded actions is already monitored by using the Earned Value Management (EVM) approach.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
<p>which have similar objectives and with global initiatives in the same field? (<u>external coherence</u>)</p>	<ul style="list-style-type: none"> • Degree of coherence between the programme and other EU policies (external coherence). <ul style="list-style-type: none"> ◦ Focus on DSM, Digital Strategy, ICT standardisation, Single digital gateway, eGovernment Action Plan, Tallinn Declaration on eGovernment, Data Strategy. • Degree of coherence between the programme and global initiatives in the field (external coherence). <ul style="list-style-type: none"> ◦ Focus on OECD Digital Government and the UNPAN. • Level of re-use of results of a funded action by another action within the ISA² programme (internal coherence). • Level of re-use of results delivered by ISA² actions by other EU programmes (external coherence). 	<ul style="list-style-type: none"> • Qualitative assessment of synergies/overlaps between objectives of the programme and other relevant EU programmes/policies. • Qualitative assessment of synergies/overlaps between funded actions and those of other relevant EU programmes. • Qualitative assessment of synergies/overlaps between the programme and global initiatives in the same field. • Instances of re-use of results delivered by funded actions by other actions within the programme. • Instances of re-use of results delivered by funded actions by other EU programmes. 	<ul style="list-style-type: none"> ◦ ISA² action owners. ◦ ISA² solution users – European Commission. ◦ ISA² solution users – Member States. ◦ Stakeholders responsible for linked EU policies/initiatives. ◦ Standardisation organisations. ◦ Experts. ◦ Indirect beneficiaries and wider public (optional). • Secondary information from operational documents and other official documents, such as: <ul style="list-style-type: none"> ◦ ISA² Decision and accompanying documents. ◦ ISA² Rolling Work Programme. ◦ ISA² Annual Monitoring and Evaluation Reports. ◦ ISA² Quarterly Monitoring Reports. ◦ Documentary evidence on funded actions (e.g. official deliverables, final reports). ◦ Legal texts establishing other relevant programmes accompanying documents. ◦ Legal texts devising other relevant EU policies and accompanying documents. ◦ Documents describing global initiatives in the field. ◦ Interim Evaluation of ISA². ◦ Other interim/final evaluations of EU programmes and policies. 	<p>following categories of stakeholders:</p> <ul style="list-style-type: none"> ◦ Governance of ISA². ◦ ISA² action owners. ◦ ISA² solution users – European Commission. ◦ ISA² solution users – Member States. ◦ Stakeholders responsible for linked policies/initiatives. ◦ Standardisation organisations. • Public consultation (optional). • Quantitative assessment of responses to interviews and surveys (Likert scale). • Qualitative assessment of responses to interviews and surveys and data and information collected via desk research. • Success stories/lessons learnt. • Expert assessment.
Evaluation criterion #5: EU added value				
8. What is the additional value	<ul style="list-style-type: none"> • Achievement of objectives that could 	<ul style="list-style-type: none"> • Share of stakeholders confirming the need for 	<ul style="list-style-type: none"> • Primary information on cross-border interoperability and EU 	<ul style="list-style-type: none"> • Desk research.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
<p>resulting from the ISA² programme, compared to what could reasonably have been expected from Member States acting at national, regional and/or local levels?</p>	<ul style="list-style-type: none"> not be otherwise attained with national or sub-national interventions. Achievement of objectives at a cost lower than what could be attained via national or sub-national interventions. Achievement in terms of cross-border interoperability. Contribution to the advancement of common EU policies. 	<p>an EU intervention to achieve the objectives of the programme.</p> <ul style="list-style-type: none"> Share of stakeholders confirming that an EU intervention is able to achieve the objectives of the programme at cost lower than costs of national or sub-national interventions. Share of stakeholders' providing positive feedback on achievements in terms of cross-border interoperability. Qualitative assessment of the contribution to the advancement of common EU policies. Quantitative assessment of indicators summarising cross-border outputs of the programme. 	<p>added value from the following categories of stakeholders:</p> <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Standardisation organisations. Experts. Indirect beneficiaries and wider public (optional). Secondary information from operational documents and other official documents, such as: <ul style="list-style-type: none"> ISA² Decision and accompanying documents. ISA² Rolling Work Programme. ISA² Annual Monitoring and Evaluation Reports. ISA² Quarterly Monitoring Reports. Documentary evidence on funded actions (e.g. official deliverables, final reports). Interim Evaluation of ISA². 	<ul style="list-style-type: none"> Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Online surveys/written questionnaires targeted to the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Standardisation organisations. Success stories/lessons learnt. Public consultation (optional). Quantitative assessment of responses to interviews and surveys (Likert scale). Qualitative assessment of responses to interviews and surveys and of data and information collected via desk research. Expert assessment.
Evaluation criterion #6: Utility¹⁰⁰				
<p>9. How do the ISA² programme's actions and results, achieved and anticipated, compare with the needs they are</p>	<ul style="list-style-type: none"> Degree of alignment between stakeholders' perception of needs and problems at national and sub-national levels and the 	<ul style="list-style-type: none"> Share of stakeholders confirming the alignment between the results of the programme and current needs and problems at national and sub-national levels. 	<ul style="list-style-type: none"> Primary information on user satisfaction and utility from the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. 	<ul style="list-style-type: none"> Desk research. Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission.

¹⁰⁰ The utility criterion to some extent is similar to the relevance criterion insofar as they both look at stakeholders' needs. However, while the relevance criterion looks at the alignment between the objectives of the programme and the current needs and problems experienced by stakeholders, the utility criterion focuses on how the actual results of the programme have (or do not have) contributed to meeting stakeholders' needs. Hence, the utility criterion is a proxy for measuring users' satisfaction.

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
supposed to address?	<ul style="list-style-type: none"> • results of the programme. • Degree of alignment between stakeholders' perception of needs and problems at EU level and the results of the programme. • User satisfaction, with a breakdown by stakeholder group. 	<ul style="list-style-type: none"> • Share of stakeholders confirming the alignment between the results of the programme and current needs and problems at EU level. • Qualitative assessment of the alignment between the results of the programme and current needs and problems. • Quantitative assessment of users' satisfaction (Likert Scale). • Quantitative assessment of the take-up by EU, national and sub-national administrations of ISA² outputs. 	<ul style="list-style-type: none"> ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked EU policies/initiatives. ○ Standardisation organisations. ○ Experts. ○ Indirect beneficiaries and wider public (optional). • Secondary information on utility from operational documents, other official documents and relevant literature, such as: <ul style="list-style-type: none"> ○ ISA² Rolling Work Programme. ○ ISA² Annual Monitoring and Evaluation Reports. ○ ISA² Quarterly Monitoring Reports. ○ Documentary evidence on funded actions (e.g. official deliverables, final reports). ○ Interim evaluation of ISA². 	<ul style="list-style-type: none"> ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked EU policies/initiatives. • Online surveys/written questionnaires targeted to the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Stakeholders responsible for linked policies/initiatives. ○ Standardisation organisations. • Success stories/lessons learnt). • Public consultation (optional). • Quantitative assessment of responses to interviews and surveys (Likert scale) • Qualitative assessment of responses to interviews and surveys and of data and information collected via desk research. • Expert assessment.
Evaluation criterion #7: Sustainability				
10. To what extent is the financial, technical and operational sustainability of the developed solutions – maintained and operated through the ISA ² Programme – ensured?	<ul style="list-style-type: none"> • Extent to which the results achieved by the ISA² Programme are expected to last if funding for actions covered by the programme would not be available in the future. • Extent to which 'cost recovery' solutions could be introduced. 	<ul style="list-style-type: none"> • Share of stakeholders expecting that results achieved so far would last if funding for actions covered by the programme would not be available in the future. • Share of actions requiring operation and maintenance costs to deliver their results. • Share of actions requiring technical and operational 	<ul style="list-style-type: none"> • Primary information on sustainability from the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. ○ Standardisation organisations. ○ Experts. 	<ul style="list-style-type: none"> • Desk research. • Interviews with the following categories of stakeholders: <ul style="list-style-type: none"> ○ Governance of ISA². ○ ISA² action owners. ○ ISA² solution users – European Commission. ○ ISA² solution users – Member States. • Online surveys/written questionnaires targeted to the following categories of stakeholders:

Evaluation questions	Success/judgment criteria	Indicators	Data sources	Data collection / analysis methods
		<p>support to deliver their results.</p> <ul style="list-style-type: none"> Share of stakeholders who would pay to keep on using specific ISA² solutions. 	<ul style="list-style-type: none"> Secondary information on sustainability from operational documents, other official documents and relevant literature, such as: <ul style="list-style-type: none"> ISA² Rolling Work Programme. ISA² Annual Monitoring and Evaluation Reports. ISA² Quarterly Monitoring Reports. Documentary evidence on funded actions (e.g. official deliverables, final reports). Interim Evaluation of ISA². 	<ul style="list-style-type: none"> Governance of ISA². ISA² action owners. ISA² solution users – European Commission. ISA² solution users – Member States. Standardisation organisations. Quantitative assessment of responses to interviews and surveys (Likert scale). Qualitative assessment of responses to interviews and surveys and of data and information collected via desk research. Quantitative assessment of operation and maintenance costs. Expert assessment.

Source: Authors' own elaboration on ISA² Interim Evaluation (CEPS, 2019).

Annex G Supporting evidence for the final evaluation of the ISA² programme

Annex G.1 Sampling strategy for the ISA² actions

The aim of the final evaluation of the ISA² programme is to provide an overall assessment of the performance of ISA². In this context, a sample of actions has been selected to better guide the data collection activities.¹⁰¹ More specifically, the evaluation is conducted on a sample of 21 actions selected out of the total of 54 actions included in the 2020 Rolling Work Programme. To ensure comparability with the interim evaluation, the same sample of action was selected as for the interim evaluation.¹⁰² One additional action was included in the sample in order to account for new developments in the programme, namely the new action that started after the interim evaluation of the programme was conducted (the action "2019.01 Interoperability Academy"). Three main criteria have been used to select the sample:

1. Action packages: the selected actions should be largely representative of the nine ISA² packages of actions, as they are defined in the Rolling Work Programme.
2. New actions and actions continued from ISA: within each action package, the selected actions should be representative of two clusters, namely those actions that have been continued from ISA and those actions that have been started under ISA².
3. New actions since the interim evaluation of ISA²: to keep track of most recent developments, the Study Team included in the sample the new action that started after the interim evaluation of the programme was conducted (namely action "2019.01 Interoperability Academy").

To build the sample, several steps were followed. First, the 54 actions funded by ISA² were grouped according to the packages to which they belong. Second, within each package, the Study Team identified those actions that were continued from ISA and those that were introduced under ISA². Third, a target sample size of 21 actions (i.e. more than one-third of the total) was set in order to ensure the feasibility of the evaluation while allowing for a comprehensive sample of typical actions (see Table 12). Then the Study Team identified the number of actions to be selected based on: i) the share of actions from each package relative to the total number of actions; and ii) the share of old and new actions compared to the total number of actions per package. The relative shares were then rounded off. The final sample is presented in Table 13, which also provides an overview of the solutions stemming from selected actions. Beyond the criteria outlined above, the sampled actions have been randomly selected to avoid any selection bias.

Importantly, the sampled actions contribute to the assessment of how the ISA² programme has contributed to the implementation of the IAP (annexed to the 2017 EIF Communication).¹⁰³ For further details please see Annex G.8. Thus the sample of ISA² actions contributes to assessing not only the performance of the programme across the evaluation criteria, but also to understanding how the programme has contributed to implementing the IAP.

¹⁰¹ Stakeholders related to all 54 actions will be invited to answer the online surveys. However, desk research (review of documentary evidence) and interviews focused only on sampled actions.

¹⁰² CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²).

¹⁰³ COM(2017) 134 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, European Interoperability Framework - Implementation Strategy

Table 12 Number of sampled actions by package and programme

Package	Number of actions	Number of ISA actions	Number of ISA ² actions	Package actions / Total actions proportion	Number of sampled actions (total)	Number of sampled actions (ISA)	Number of sampled actions (ISA ²)
1. Key and generic interoperability enablers	7	5	2	13%	2	2	0
2. Semantic interoperability	4	1	3	7%	2	1	1
3. Access to data/data sharing/open data	7	2	5	13%	3	1	2
4. Geospatial solutions	1	1	0	2%	1	1	0
5. eProcurement/ eInvoicing - Supporting instruments	1	1	0	2%	1	1	0
6. Decision making and legislation - Supporting instruments	10	5	5	19%	3	1	2
7. EU Policies - Supporting instruments	5	3	2	9%	1	1	0
8. Supporting instruments for public administrations	17	11	6	31%	6	5	2
9. Accompanying measures	2	0	2	4%	1	0	1
TOTAL	54	29	25	100%	21	13	8

Note: The column "Number of ISA actions" denotes the number of actions continued under ISA² from previous editions of the programme. The column "Number of ISA² actions" denotes the number of actions that were newly started under ISA², which are not a direct continuation of any actions of the previous editions of the programme.

Source: Authors' elaboration on Rolling Work Programme.

Table 13 Sampled actions and relevant solutions

Package	Action number	Action Name	ISA/ ISA ²	Solutions			
1. Key and generic interoperability enablers	2016.19	Trusted Exchange Platform (e-TrustEx)	ISA	Common tool/service: Open e-TrustEx			
1. Key and generic interoperability enablers	2016.29	Catalogue of Services	ISA	Common framework: Core Public Service Vocabulary Application Profile (CPSV-AP)			
2. Semantic interoperability	2016.07	SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	ISA	Common framework (data models, data standards): Core vocabularies	Common specification/stand ard: ADMS	Common specification: DCAT Application Profile for data portals in Europe (DCAT-AP), GeoDCAT-AP, StatDCAT-AP	Common tool/service: VocBench3
2. Semantic interoperability	2016.16	Public Multilingual Knowledge Management	ISA ²	Common framework: PMKI Core data model for multilingual	Common specification/stand ard: Semantic links - core		

Package	Action number	Action Name	ISA/ ISA ²	Solutions			
		Infrastructure for the DSM		taxonomies/terminologies	dataset with additional semantic links between different language resources (in particular having EuroVoc as pivot)		
3. Access to data/data sharing/open data	2016.03	Big Data for Public Administrations	ISA	Study: Big data analytics for policy making	Common tool/service: DORIS - stakeholders' feedback analysis tool	Study: Big Data Test Infrastructure	
3. Access to data/data sharing/open data	2016.06	Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System	ISA ²	Common framework: ESS: Statistical Production Reference Architecture v1.0			
3. Access to data/data sharing/open data	2016.18	Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	ISA ²	Common tool/service: Catalogue of data visualisation tools (part of EU Open Data portal)			
4. Geospatial solutions	2016.10	European Location Interoperability Solutions for e-Government (ELISE)	ISA	Common tool/service: Re3gistry	Common framework: EULF Blueprint	Common tool/services: Common services, pilots and applications;	Common tool/service: INSPIRE Reference Validators and Interoperability Testing
5. eProcurement/ eInvoicing - Supporting instruments	2016.05	European Public Procurement Interoperability Initiative	ISA	Common tool/service: Open e-Prior	Common tool/service: eCertis	Common tool/service: European Single Procurement Document (ESPD) service as well as	

Package	Action number	Action Name	ISA/ ISA ²	Solutions			
						a data model on the ESPD	
6. Decision making and legislation - Supporting instruments	2016.23	Legal interoperability (former ICT Implications of EU Legislation)	ISA	Common tool: Tool #27 of the Better Regulation Toolbox: The digital economy and society & ICT issues	Common framework: ICT Impact Assessment Guidelines	Common tool: Decision supporting tool on interoperability	
6. Decision making and legislation - Supporting instruments	2017.03	REFIT Platform	ISA ²	Common tool/service: REFIT Platform IT Tool			
6. Decision making and legislation - Supporting instruments	2017.04	Inter-Institutional Register of Delegated Acts (RegDel)	ISA ²	Common tool/service: Register of Delegated Acts (RegDel)			
7. EU Policies - Supporting instruments	2016.14	European Citizens' Initiatives and European Parliament Elections	ISA	Common tool/service: Online Collection Software to support European Citizens' Initiatives (OCS for ECIs)	Common tool/service: European Parliament Crypto Tool		
8. Supporting instruments for public administrations	2016.20	Joinup – European Collaborative Platform and Catalogue	ISA	Common tool/service: Joinup			
8. Supporting instruments for public administrations	2016.21	NIFO	ISA	Common framework: NIFO factsheets	Common framework: State of play of interoperability in Europe		
8. Supporting instruments for public administrations	2016.32	European Interoperability Architecture (EIA)	ISA	Common framework: EIRA	Common tool/service: CarTool		
8. Supporting instruments for public administrations	2016.35	EUSurvey	ISA	Common tool/service: EUSurvey	Common tool/service: DORIS		

Package	Action number	Action Name	ISA/ ISA ²	Solutions			
8. Supporting instruments for public administrations	2016.37	IMAPS	ISA	Common tool/service: IMAPS			
8. Supporting instruments for public administrations	2017.01	Standard-Based Archival Data Management, Exchange and Publication	ISA ²	Study: Study on Standard-Based Archival Data Management, Exchange and Publication	Common tool: Assessment tool offering support for the selection of IT solutions for archives management.		
8. Supporting instruments for public administrations	2019.01	Interoperability Academy	ISA ²	Common tool/service: Interoperability Academy Winter School	Common tool/service: Interoperability Academy Catalogue of Educational Training Resources		
9. Accompanying measures	2016.3	Raising Interoperability Awareness – Communication Activities	ISA ²	Events organised by ISA ²	Events in which ISA ² participated		

Source: Authors' elaboration on information from the Rolling Work Programme and the ISA² website.

Annex G.2 Overview of performance indicators for the sampled ISA² actions and solutions

This annex presents relevant performance indicators for the solutions of the sampled ISA² actions. The data presented is based on the ISA² dashboard and the webpages dedicated to ISA² actions and solution. The performance indicators contribute primarily to the assessment of the effectiveness of the programme and its EU added value. The table presents one or two performance indicators per solution, as relevant depending on the solution type. The value of each performance indicator is listed in a dedicated column ("Value performance indicator 1"; "Value performance indicator 2"), followed by the description of the performance indicator ("Performance indicator 1"; "Performance indicator 1"). The performance indicators were collected based on the entire duration of the programme. The data presented below was collected in January 2021.

Table 14 Overview of performance indicators for sampled ISA² actions and solutions¹⁰⁴

Package	ISA / ISA ²	Action	Solution	Value performance indicator 1	Performance indicator 1	Value performance indicator 2	Performance indicator 2
1. Key and generic interoperability enablers	ISA	2016.19	e-TrustEx	200	Number of public administrations in the 28 Member States using the solution	16,700,000 ¹⁰⁵	Number of documents exchanged between connected EU institutions, as well as public and private entities in the Member States
1. Key and generic interoperability enablers	ISA	2016.29	CPSV-AP	12	Number of public administrations in the Member States using the solution (including in cases of cross-border catalogues)	701	Number of downloads on Joinup (up through January 2021) of the latest version of CPSV-AP (version 2.2.1 released in 2019)
2. Semantic interoperability	ISA	2016.07	ADMS	9	Number of public administrations (the Member States and the EU institutions) and businesses using the solution	2,934	Number of interoperability solutions on Joinup described using ADMS (ADMS is used for organising the descriptive metadata of all solutions on Joinup; in January 2021, 2,934 solutions were available on Joinup and thus described using the ADMS solution)
2. Semantic interoperability	ISA	2016.07	Core vocabularies	11	Instances of use of the solution by Public administrations (in the		

¹⁰⁴ The ISA² solutions are part of the EIF toolbox, supporting and contributing to the achievement of the objectives of the EIF. The EIF Toolbox is available on Joinup: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/solution/eif-toolbox/eif-toolbox>

¹⁰⁵ The information was updated based on additional feedback received from the action owners.

Package	ISA / ISA ²	Action	Solution	Value performance indicator 1	Performance indicator 1	Value performance indicator 2	Performance indicator 2
					Member States and the EU institutions)		
2. Semantic interoperability	ISA	2016.07	DCAT-AP	29	Instances of use of the solution by Public administrations (in the Member States and the EU institutions) and their data portals, associations, universities.		
2. Semantic interoperability	ISA	2016.07	VocBench3	14	Number of public administrations (in the Member States and the EU institutions), universities, institutes, international organisations using the previous versions of VocBench.		
2. Semantic interoperability	ISA ²	2016.16	PMKI Core data model for multilingual taxonomies/terminologies	2 journal articles; 7 international conference proceedings	Instances of inclusion in academic journals and international conferences		
2. Semantic interoperability	ISA ²	2016.16	Semantic Links	4	Collaborations with European public administrations to establish semantic interoperability between national language resources and EuroVoc (3 Member States and the EU institutions)		
3. Access to data/data sharing/open data	ISA ²	2016.06	ESS Service	20	Number of registered contributors (Member States)	28	Number of National Statistical Institutes' CIOs and Heads of Methodology who adopted the ESS reference architecture
3. Access to data/data sharing/open data	ISA ²	2016.18	Data Visualisation Tools Catalogue	31	Number of visualisation tools, trainings, examples and re-usable visualisations		
4. Geospatial solutions	ISA	2016.10	Re3gistry	13	Number of users of solution by Public administrations (Member States and the EU institutions) and projects	214	Number of downloads on Joinup platform
4. Geospatial solutions	ISA	2016.10	EULF Blueprint	29	Number of public administrations using the solution (Member States and the EU institutions)		
4. Geospatial solutions	ISA	2016.10	Studies on Location	8	Number of studies published on location information, including best practices		

Package	ISA / ISA ²	Action	Solution	Value performance indicator 1	Performance indicator 1	Value performance indicator 2	Performance indicator 2
			information (ELISE)				
5. eProcurement/ eInvoicing - Supporting instruments	ISA	2016.05	Open e-Prior	70	Number of public administrations using the solution (EU institutions)	306	Number of suppliers connected via the web portal
5. eProcurement/ eInvoicing - Supporting instruments ¹⁰⁶	ISA	2016.05	eCertis	44 ¹⁰⁷	Public administrations (Member States and the EU institutions), contracting authorities, companies	25	Connections from Member States' solutions to eCertis ¹⁰⁸
5. eProcurement/ eInvoicing - Supporting instruments ¹⁰⁹	ISA	2016.05	ESPD	35,752	Number of solution downloads	75	Number of ESPD solutions, either using the data model or the open source version of the ESPD service developed under ISA ²
6. Decision making and legislation - Supporting instruments ¹¹⁰	ISA	2016.23	Digital screening mentioned in Tool #27 of the Better Regulation Toolbox: The digital economy and society & ICT issues	955	Number of Commission proposals screened for ICT impacts between 2014 and 2020		
6. Decision making and legislation - Supporting instruments	ISA	2016.23	ICT Impact Assessment Guidelines (updated)	11	Instances of known use of the updated version (since 2018)		
6. Decision making and legislation -	ISA ²	2017.03	REFIT Platform IT Tool	No instance of re-use/internal tool	No instance of re-use/internal tool		

¹⁰⁶ The information was updated based on additional feedback received from the action owners.

¹⁰⁷ In addition, 3000 unique visitors were recorded in June 2021, based on additional information received from the action owners.

¹⁰⁸ The information was updated based on additional feedback received from the action owners.

¹⁰⁹ The information was updated based on additional feedback received from the action owners.

¹¹⁰ The information was updated based on additional feedback received from the action owners.

Package	ISA / ISA ²	Action	Solution	Value performance indicator 1	Performance indicator 1	Value performance indicator 2	Performance indicator 2
Supporting instruments							
6. Decision making and legislation - Supporting instruments	ISA ²	2017.04	RegDel	144,587	Number of page views since the launch up until 1 February 2019	2,202	Number of active subscriptions
7. EU Policies - Supporting instruments	ISA	2016.14	Online Collection Software to support European Citizens' Initiative	45	Number of ECIs launched using the Online Collection Software (out of 57 ECIs launched between April 2012 and April 2019)		
7. EU Policies - Supporting instruments	ISA	2016.14	European Parliament Crypto Tool	27	Number of Member States using the solution		
8. Supporting instruments for public administrations	ISA	2016.20	Joinup	16,092	Number of professionals working in the field of e-Government registered on Joinup (As of 14 January 2021)	2,934	Number of solutions available within the 147 Collections (thematic collaborative spaces) on Joinup.(in January 2021).
8. Supporting instruments for public administrations	ISA	2016.21	NIFO factsheets	253	Number of members on Joinup webpage	36	Number of countries covered in Digital Public Administration Factsheets
8. Supporting instruments for public administrations	ISA	2016.32	EIRA and CarTool	10	Number of public administrations in Member States and EU deploying the solution	3,610	Number of downloads of EIRA on Joinup up to January 2021
8. Supporting instruments for public administrations	ISA	2016.35	EUSurvey	29,200	Number of surveys created (sum for 2016, 2017, 2018, Q2 in 2019 and Q3 in 2020), based on the ISA ² solution webpage, on 2018/2019 Rolling Work Programme and ISA ² action Dashboard		
8. Supporting instruments for public administrations	ISA	2016.37	IMAPS	141	Total number of IMPAS assessments (2018 - 2020) based		

Package	ISA / ISA ²	Action	Solution	Value performance indicator 1	Performance indicator 1	Value performance indicator 2	Performance indicator 2
					on the 2018 and 2020 editions of the Report on IMAPS Results ¹¹¹		
8. Supporting instruments for public administrations	ISA ²	2017.01	Study on Standard-based Archival Data Management, Exchange, and Publication	80	Unique visitors/downloads since the publication (2018)		
8. Supporting instruments for public administrations	ISA ²	2017.01	Assessment tool offering support for the selection of IT solutions for archives management	58	Unique visitors/downloads since the publication (2018)		
8. Supporting instruments for public administrations	ISA ²	2019.01	Interoperability Academy Winter School	150	Number of participants (from public administration, academia, and private sector)		
8. Supporting instruments for public administrations	ISA ²	2019.01	Interoperability Academy Catalogue of Educational Training Resources	35	Number of resources included in Catalogue		
9. Accompanying measures	ISA ²	2016.3	Raising Interoperability Awareness – Communication Activities	50	Events organised by ISA ²	82	Events in which ISA ² participated

Note: The data presented in this table were collected on the 14-15 January 2021.

Source: Authors' elaboration based on the ISA² [Actions](#) and [Solutions](#) webpages, [Joinup](#) and [the ISA² Work Programme 2020](#), ISA² Interim Evaluation (CEPS, 2019).

¹¹¹ Report on IMAPS results, 2018 edition, Directorate-General for Informatics, European Commission, https://joinup.ec.europa.eu/sites/default/files/solution/documentation/2018-05/ISA2%20Action%202016.37%20Report%20on%20IMAPS%20results.%202018%20Edition_0.pdf; Report on IMAPS results, 2020 edition, Directorate-General for Informatics, European Commission, https://ec.europa.eu/isa2/sites/isa/files/report_on_imaps_results.pdf

Annex G.3 Overview of the take-up of solutions of the sampled ISA² actions

This annex presents an overview of how the solutions of the sampled ISA² actions have been taken up in the EU institutions (Table 15) and by public administrations in the Member States (Table 16), based on the information available on the ISA² Actions and Solutions webpages and additional information provided in the evaluation process by ISA² action owners. This annex contributes primarily to the assessment of the effectiveness and EU-added value of the programme.

Table 15 Overview of EU institutions using sampled ISA² solutions

Solutions	European Commission	Council of the EU	European Parliament	Publications Office of the EU	European Council	European Central Bank	TOTAL
ADMS				x			1
Core Vocabularies	x			x			2
DCAT-AP	x			x			2
eCertis	x					x	2
EIRA and CarTool	x	x		x			3
e-TrustEx	x	x	x	x			4 ¹¹²
EUSurvey	x		x	x	x		4
GeoDCAT-AP	x						1
Open e-Prior	x			x			2
Re3gistry	x						1
RegDel	x	x	x	x			4
VocBench3	x			x			2
TOTAL	11	3	3	9	1	1	28

Note: Data was collected on 14-15 of January 2021

Source: Author's elaboration based on the ISA² [Actions](#) and [Solutions](#) webpages

¹¹² The overview was updated based on additional feedback received from the action owners.

Table 16 Overview public administrations in the Member States using sampled ISA² solutions

Solution	B E	B G	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	TOT.
ADMS					x				x			x																3
Core Vocabulari es	x					x			x			x							x									5
CPSV-AP¹¹³	x				x	x	x	x	x			x							x			x			x	x		11
DCAT-AP	x				x		x		x			x							x								x	7
eCertis	x	x	x	x	x		x	x	x	x	x	x	x		X		x		x	x	x	x		x	x	x	x	22
EIRA¹¹⁴	x		x	x		x			x			x				x			x							x	x	10
e-PRIOR	x																											1
ESPD¹¹⁵	x	x	x	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x	X	x	x	x	x	x	x	25
Open e- TrustEx¹¹⁶	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	27
European Parliament Crypto Tool	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	27
EUSurvey									x																			1
GeoDCAT- AP					x																							1
IMAPS	x		x	x		x		x	x	x	x	x	x				x	x	x	x					x		x	17
Joinup	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	25
NIFO	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x		x	x	x	x	x	x	x	25
OCS for ECIs																x												1
Re3gistry									x	x		x									x				x	x		6

Note: The data presented reflect the available information as of 15 January 2021

Source: Author's elaboration based on the ISA² [Actions](#) and [Solutions](#) webpages and the ISA² Interim Evaluation (CEPS, 2019).

¹¹³ In certain cases, such as data models including the CPSV-AP, the use of a specific ISA² solution refers to the fact that the Member States use solutions that are aligned with the ones developed as part of the ISA² programme.

¹¹⁴ The overview was amended based on additional feedback received from the action owner of the European Interoperability Architecture action.

¹¹⁵ The overview was updated based on additional feedback received from the action owners..

¹¹⁶ The overview was updated based on additional feedback received from the action owners. The e-TrustEx solution is used by all Member States in the context of the DECIDE project.

Annex G.4 Overview of studies, reports and papers developed as part of the sampled ISA² actions

This annex provides a summary of the studies, reports and papers published as part of the implementation of ISA² actions, forming a particular type of output category of the programme. The information presented was collected from the ISA² Actions and Solutions webpages and Joinup. This annex contributes to the assessment of the effectiveness criterion.

Table 17 Overview of studies, reports and papers developed as part of the sampled ISA² actions

Package	Action number	Action Name	Studies, reports, papers
1. Key and generic interoperability enablers	2016.29	Catalogue of Services	<ul style="list-style-type: none"> "Architecture for public service chatbots" (2019); "European taxonomy for public services" (2019); "Guidelines on how to build catalogues of public services at one-stop-shop portals and improve user experience" (2018)
2. Semantic interoperability	2016.07	SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	<ul style="list-style-type: none"> "Use cases and benefits of ISA² specifications" (2019); "GDPR Data Portability and Core Vocabularies" (2018); "Towards an open government data ecosystem in Europe using common standards" (2017)
2. Semantic interoperability	2016.16	Public Multilingual Knowledge Management Infrastructure for the DSM	<ul style="list-style-type: none"> P. Schmitz, F. Sanmartin, E. Francesconi, N. Hajlaoui, B. Batouche, Automatic Alignment of Multilingual Resources in the Linguistic Linked Open Data Cloud, in Journal of Open Access to Law; M. Fiorelli, A. Stellato, T. Lorenzetti, A. Turbati, P. Schmitz, E. Francesconi, N. Hajlaoui, B. Batouche. Towards OntoLex-Lemon editing in VocBench 3, in AIDAinformazioni, Rivista di scienze dell'informazione, ISBN 978-88-548-8992-7, ISSN 1121-0095.; A. Stellato, A. Turbati, M. Fiorelli, T. Lorenzetti, P. Schmitz, E. Francesconi, N. Hajlaoui, B. Batouche, Towards the Assessment of Gold-Standard Alignments between Legal Thesauri, in JURIX 2018 - The 31st international conference on Legal Knowledge and Information Systems. December 12–14, 2018 in Groningen, Netherlands; P. Schmitz, E. Francesconi, N. Hajlaoui, B. Batouche, A. Stellato, Semantic Interoperability of Multilingual Language Resources by Automatic Mapping', in Proceedings of the 7th International Conference on Electronic Government and the Information Systems Perspective (EGOVIS 2018), Regensburg, Germany 3-6 September 2018; Schmitz P., Francesconi E., Hajlaoui N., Batouche B., PMKI: a European Commission action for the interoperability, maintainability and sustainability of Language Resources in Proceedings of the 11th edition of the Language Resources and Evaluation Conference, 7-12 May 2018, Miyazaki (Japan);

Package	Action number	Action Name	Studies, reports, papers
			<ul style="list-style-type: none"> • Stellato A., Fiorelli M., Turbati A., Lorenzetti T., Schmitz P., Francesconi E., Hajlaoui N., Batouche B., Dataset Alignment and Lexicalization to Support Multilingual Analysis of Legal Documents in AI Approaches to the Complexity of Legal Systems - Models and Ethical Challenges for Legal Systems, Legal Language and Legal Ontologies, Argumentation and Software Agents, within JURIX 2017 Conference, University of Luxembourg, 13-15 December 2017; • Schmitz P., Francesconi E., Hajlaoui N., Batouche B., Towards a Public Multilingual Knowledge Management Infrastructure for the European Digital Single Market, in Proceedings of the LDK 2017 Workshops: 1st Workshop on the OntoLex Model (OntoLex-2017), Shared Task on Translation Inference Across Dictionaries & Challenges for Wordnets, co-located with 1st Conference on Language, Data and Knowledge (LDK 2017), pp. 33-42, CEUR Workshop Proceedings Vol-1899, ISSN 1613-0073, Galway, Ireland, 8 June 2017; • M. Fiorelli, A. Stellato, T. Lorenzetti, A. Turbati, P. Schmitz, E. Francesconi, N. Hajlaoui, B. Batouche, "Editing OntoLex-Lemon in VocBench 3", in Proceedings of the 12th International Conference on Language Resources and Evaluation (LREC 2020), Marseille, France, 11-16 May 2020; • M. Fiorelli, A. Stellato, T. Lorenzetti, P. Schmitz, E. Francesconi, N. Hajlaoui and B. Batouche, "Metadata-driven Semantic Coordination", in 13th International Conference on Metadata and Semantics Research, Rome, Italy, 28-31 October 2019.
3. Access to data/data sharing/open data	2016.03	Big Data for Public Administrations	<ul style="list-style-type: none"> • "Big Data Analytics for Policy Making Report" (2016)
4. Geospatial solutions	2016.10	European Location Interoperability Solutions for e-Government (ELISE)	<ul style="list-style-type: none"> • "Assessment of economic opportunities and barriers related to geospatial data in the context of the Digital Single Market" (2018); • "Digital Government Benchmark - Study on Digital Government Transformation" Final Report (2018); "Study on Digital Government Transformation" Final Report (2018) • "Digital Government Benchmark - API study" Final Report (2018); • "Blockchain for Digital Government" Final Report (2019); • "Exploring Digital Government Transformation: understanding public sector innovation in a data-driven society" (2020); • "INSPIRE-MMTIS, overlap in standards related to the Delegated Regulation (EU) 2017/1926" (2019); • "The role of Spatial Data Infrastructures in the Digital Government Transformation of Public Administrations" (2019); • "Study of the terms of use applied in the INSPIRE resources and their usability barriers" (2019); • "Artificial Intelligence in the public sector. Use, impact and governance of AI in the public sector of the EU" (2020);

Package	Action number	Action Name	Studies, reports, papers
			<ul style="list-style-type: none"> "Data Ecosystems for Geospatial Data: Establishment of Sustainable Data Ecosystems" (2020); "WGIC Geospatial Information and Privacy - Policy Perspectives and Imperatives for the Geospatial Industry" (2020); "Location intelligence benchmarking study" (2020). "Establishing a new baseline for monitoring the status of EU Spatial Data Infrastructure" (2020)¹¹⁷
6. Decision making and legislation - Supporting instruments	2016.23	Legal interoperability (former ICT Implications of EU Legislation)	<ul style="list-style-type: none"> "Case study analysis of regulatory reporting practices across the European Commission" (2019); "ICT Impact Assessment Guidelines: Practical tools and guidelines for assessing ICT implications" (2018).
8. Supporting instruments for public administrations	2016.21	NIFO	<ul style="list-style-type: none"> "The role of eGovernment and Interoperability in the European Semester process" (2018, 2019 and 2020); "eGovernment factsheets anniversary report" (2019); "Report on the state-of-play of digital public administration and interoperability" (2020); "Report on public administrations' digital response to COVID-19 in Europe" (2021). In addition, the action also published regularly factsheets and infographics: Digital public administration and interoperability factsheets and infographics (2018,2019, 2020) covering 35 European countries.
8. Supporting instruments for public administrations	2016.37	IMAPS	<ul style="list-style-type: none"> "Report on IMAPS results" (2018, 2020)
8. Supporting instruments for public administrations	2017.01	Standard-Based Archival Data Management, Exchange and Publication	<ul style="list-style-type: none"> "Study on Standard-Based Archival Data Management, Exchange and Publication" (2018)

Note: The information presented reflects the available information as of 15th of January 2021
Source: Authors' elaboration based on the ISA² [Actions](#) and [Solutions](#) webpages and Joinup.

¹¹⁷ The overview was amended to include additional input received from ISA² action owners.

Annex G.5 Communication activities

This annex presents an overview of the communication activities linked to the programme. It outlines both events in which ISA² representatives played an active role (Table 18) as well as events funded by ISA² (Table 19). The overview of communication activities contributes primarily to the effectiveness criterion, but also to EU added value.

Table 18 Events in which ISA² representatives played an active role

Year	Events	Location	Total participants
2016	Ljubljana ICT Procurement workshop	Ljubljana, Slovenia	N/A
2016	Nordic Digital Day	Tallinn, Estonia	N/A
2016	Open Source Summit Paris	Paris, France	180
2016	Digital Stakeholders Forum	Brussels, Belgium	150
2016	Digitec16	Brussels, Belgium	500
2016	Manage IT 2016	Antwerp, Belgium	N/A
2017	Open Belgium	Antwerp, Belgium	150
2017	SG IT Day	Brussels, Belgium	200
2017	Digital Day Rome	Rome, Italy	600
2017	ECI Day 2017	Brussels, Belgium	150
2017	ICT Spring Luxembourg 2017	Luxembourg, Luxembourg	5,000
2017	Conference Krems	Krems, Austria	N/A
2017	Digital Assembly 2017	Valletta, Malta	5,000
2017	Semantics Conference 2017	Amsterdam, The Netherlands	200
2017	ICA Conference 2017		N/A
2017	Inspire Conference 2017	Strasbourg, France	3,000
2017	Data for Policy	London, UK	200
2017	DK Architecture Conference	Copenhagen, Denmark	N/A
2017	Jornada sobre Interoperabilidad y Archivo Electronico	Madrid, Spain	180
2017	Digitalisierungsessen 17	Odense, Denmark	350
2017	Egov Conference Tallinn, 2017	Tallinn, Estonia	200
2017	3rd Annual Public Sector Transformation Conference	Brussels, Belgium	N/A
2017	3rd ELRC Conference	Brussels, Belgium	N/A
2017	ICT Proposers Day 2017	Budapest, Hungary	150
2017	Metaforum 2017	Brussels, Belgium	N/A
2017	Informatika v Javni Upravi	Brdo, Slovenia	175
2017	Paris Open Source Summit 2017	Paris, France	150
2017	Connecting Europe Facility (CEF) Conference	Brussels, Belgium	150
2017	eDemocracy Conference	Athens, Greece	100
2018	Connected Smart Cities Conference	Brussels, Belgium	500
2018	Flosscon	Brussels, Belgium	200
2018	GDPR Conference	Berlin, Germany	150
2018	Digital Czech Republic	Prague, Czech Republic	250

Year	Events	Location	Total participants
2018	Interop Summit 2018	Brussels, Belgium	150
2018	Open Belgium	Louvain La Neuve, Belgium	250
2018	RDA Berlin	Berlin, Germany	200
2018	IESA 2018	Berlin, Germany	250
2018	CNIS2018	Madrid, Spain	300
2018	Digital Day	Rome, Italy	300
2018	CEEE Gov Days 2018	Budapest, Hungary	150
2018	German Federal Level Conference	Berlin, Germany	120
2018	Good Governance Conference 2018	Brussels, Belgium	650
2018	Civil Society Days 2018	Brussels, Belgium	200
2018	Language Technology Industry Summit	Brussels, Belgium	200
2018	Egov Conference Tallinn, 2018	Tallinn, Estonia	300
2018	Conference Supervisory reporting for the Digital Age	Brussels, Belgium	150
2018	Digital Assembly 2018	Helsinki, Finland	125
2018	ICA Conference 2018	Sofia, Bulgaria	5,000
2018	ICT implications presentation in Vienna	Vienna, Austria	120
2018	Inspire Conference 2018	Antwerp, Belgium	900
2018	TOOP Conference	Vienna, Austria	150
2018	eGov High Level Conference 2018	Vienna, Austria	N/A
2018	Infofest Montenegro	Podgorica, Montenegro	150
2018	European Week of Regions and Cities 2018	Brussels, Belgium	6,000
2018	GovTech Summit 2018	Paris, France	3,000
2018	Digitec18	Brussels, Belgium	900
2018	ICT Vienna	Vienna, Austria	5,000
2018	Paris Open Source Summit 2018	Paris, France	200
2018	Symposium on Digital Transformation of the public sector 2018	Belgium	200
2018	Webinar on Government Transformation: "How co-creation will shape the future of value creation in the public sector"	Belgium	200
2018	1st CEF eTranslation Conference	Brussels, Belgium	N/A
2018	European Open Source & Free Software Law Event (EOLE 2018)	Paris, France	
2018	Paris Open Source Summit 2018, with a session on the Open Source Observatory	Paris, France	
2018	Symposium on "Digital transformation: Is it an evolution or a revolution?"	Leuven, Belgium	
2018	Webinar: Shaping the Future of Value Creation in the Public Sector	Online event	
2019	Connected Smart Cities Conference 2019, with a presentation on ISA ²	Brussels, Belgium	
2019	Startup Europe Summit 2019	Cluj-Napoca, Romania	
2019	Western Balkans Digital Summit	Belgrade, Serbia	
2019	e-Society 2019 conference	Utrecht, Netherlands	
2019	e-Governance Conference 2019: Same Goals, Different Roadmaps	Tallinn, Estonia	
2019	URBIS Smart City Fair	Brno, Czech Republic	
2019	Digital Assembly 2019	Bucharest, Romania	
2019	EU Datathon 2019	Brussels, Belgium	
2019	EGOV-CeDEM-ePart 2019	San Benedetto del Tronto, Italy	
2019	Digital Excellence Forum @ ICT Proposers' Day 2019	Helsinki, Finland	

Year	Events	Location	Total participants
2019	European Week of Regions and Cities 2019	Brussels, Belgium	
2019	Web Summit 2019	Lisbon, Portugal	
2019	GovTech Summit	Paris, France	
2020	Inspire 2020 - the Virtual Conference	Online event	
2020	Webinar: Powering public sector change through Digital Innovation Hubs	Online event	
2020	ICEGOV 2020	Athens, Greece	
2020	ReMeP 2020 - Research Meets Practice. Legal Informatics Conference	Vienna, Austria	

Source: ISA² Interim Evaluation (CEPS, 2019), the [overview events listed on the ISA² website](#), and additional feedback received from DIGIT.D2.

Table 19 Events funded by ISA² between 2016 and 2020

Year	ISA ² workshops/conferences	Location	Total participants onsite	Total participants remote	Number of international participants	Number of Member States represented	Number of EEA and acceding countries represented	Number of EC officials (non-DIGIT)
2016	From ISA to ISA ²	Brussels, Belgium	300	-	-	-	-	-
2016	SEMIC2016*	Rome, Italy	206	-	-	25	3	-
2017	Workshop on the EIF	Thessaloniki	N/A	-	-	-	-	-
2017	Sharing and re-use Conference	Lisbon, Portugal	220	810	204	21	0	
2017	SEMIC2017	Valletta, Malta	224	609	195	18	2	
2018	Open PM2 Conference (partially funded by ISA ²)	Brussels, Belgium	538	1800 (connections to web streaming)	-	-	-	-
2018	SEMIC 2018	Sofia, Bulgaria	220	701	204	19	2	
2018	ISA ² CONF18	Brussels, Belgium	325	-	249	26	7	120
2018	Workshop organised as part of the European Week of Regions and Cities 2018	Brussels, Belgium	98	-	-	-	-	-
2018	NIFO workshop (29 September 2018); several webinars in 2019, 2020	Brussels, Belgium						
2018	Workshop organised as part of the Inspire Conference	Antwerp, Belgium	95	-	-	-	-	-
2018	ISA ² Mid-Term Conference: Linking Public Administrations, Businesses and Citizens	Brussels, Belgium						
2018	ISA ² Interim Evaluation: Kick-off Workshop	Brussels, Belgium						
2018	Catalogue of Services Webinar	Online event						

Year	ISA ² workshops/conferences	Location	Total participants onsite	Total participants remote	Number of international participants	Number of Member States represented	Number of EEA and acceding countries represented	Number of EC officials (non-DIGIT)
2019	Workshop: The Future of the Open Source Observatory (OSOR)	Brussels, Belgium						
2019	EIF Workshop on Organisational Interoperability and Public Service Governance	Brussels, Belgium						
2019	Webinar: Access to Base Registries	Online event						
2019	Catalogue of Services Webinar	Online event						
2019	Webinar: The Future of the Open Source Observatory	Online event						
2019	Catalogue of Services Workshop (15 May 2019)	Brussels, Belgium						
2019	Interim Evaluation of the ISA ² Programme: Final Workshop	Brussels, Belgium						
2019	Webinar: Mastering Joinup to your advantage	Online event						
2019	Workshop on Semantic interoperability for the multilingual web	Luxembourg City, Luxembourg						
2019	Webinar on the governance models, ecosystems and benefits of APIs for public sector organisations	Online event						
2019	Sharing & Re-use Conference 2019	Bucharest, Romania						
2019	Webinar on CCCEV evolution: past, present and future	Online event						
2019	Webinar: GeoDCAT-AP - adoption and implementation experiences of the geospatial extension to DCAT-AP	Online event						
2019	Webinar on DCAT-AP major release	Online event						
2019	Webinar on the Core Public Event Vocabulary - International development and future plans	Online event						
2019	2nd EIF workshop on Organisational Interoperability and Integrated Public Service Governance	Brussels, Belgium						
2019	Access to Base Registries Webinar	Online event						

Year	ISA ² workshops/conferences	Location	Total participants onsite	Total participants remote	Number of international participants	Number of Member States represented	Number of EEA and acceding countries represented	Number of EC officials (non-DIGIT)
2019	SEMIC 2019: Linking data spaces for citizens	Helsinki, Finland						
2019	Catalogue of Services Webinar	Online event						
2019	LEOS Community webinar	Online event						
2019	Interoperability Academy Winter School	Leuven, Belgium						
2020	Catalogue of Services Webinar	Online event						
2020	Workshop: Open Source Software sustainability at FOSDEM20	Brussels, Belgium						
2020	Webinar: Introduction to the new OSOR and its Knowledge Centre	Online event						
2020	Catalogue of Services Webinar - Single Digital Gateway Metadata Model	Online event						
2020	Catalogue of Services Workshop (21 February 2020)	Brussels, Belgium						
2020	Webinar: The role of Organisational Interoperability in the context of Geospatial and Digital Government Transformation	Online event						
2020	Working group meeting: Access to Base Registries	Online event						
2020	Webinar: Location Intelligence and Partnerships to support the Sustainable Development Goals	Online event						
2020	Webinar: Digital Twins - Are they ready to embrace the benefits of Location Information?	Online event						
2020	LEOS community webinar	Online event						
2020	Webinar: Access to Base Registries	Online event						
2020	ELISE webinar: Geospatial Data and Artificial Intelligence – a deep dive into GeoAI	Online event						
2020	ELISE webinar: Location Intelligence for Cities and Regions	Online event						
2020	Solid hands-on workshop	Online event						
2020	SEMIC 2020	Online event						

Source: ISA² Interim Evaluation (CEPS, 2019) and the [overview of events listed on the ISA² website](#).

Annex G.6 Contribution of sampled ISA² actions to the principles listed in Art. 4(b) of the ISA² Decision

This annex outlines the contribution of the sampled ISA² actions to the 13 principles listed in the ISA² Decision under Art. 4(b). Importantly, the assessment of how the programme contributed to the principles is an obligation included in the ISA² Decision, in Article 13 (5).¹¹⁸

Table 20 Contribution of sampled ISA² actions to the principles listed in Art. 4(b) of the ISA² Decision

Art. 4(b) Principles	Relevant evidence
Subsidiarity and proportionality	ISA ² aims to contribute to a holistic interoperability landscape by creating solutions at the EU level. The adoption of solutions by European public administrations is voluntary.
User-centricity	As part of the proposal process of actions to be included in the rolling work programme, all the proposed actions must take into account user-centricity and describe the ways in which user input is integrated into the action and the development of solutions. For example, user-centricity was considered in the design and implementation of the new features of "NIFO" action by getting a feedback from relevant stakeholders. ¹¹⁹
Inclusion and accessibility	ISA ² relies on a number of channels to disseminate the information about the actions and the solutions developed: i) ISA ² website, including information dedicated to each action and solution, official documents, infographics, videos, presentations, training material, and publications; ii) Joinup as a platform for sharing the solutions developed under ISA ² ; iii) events organised by ISA ² in various Member States and the distribution of promotional material; and iv) events with ISA ² participation in various Member States and the distribution of promotional material. In addition, solutions take into account potential barriers to accessibility and inclusion, detailing such barriers where relevant and providing solutions. An example is the "EU CAPTCHA" ¹²⁰ action, which aims to address the issues of accessibility of CAPTCHA tests by exploring alternative solutions to improve the user experience.
Delivery of public services in such a way as to prevent digital divide	As part of the proposal process of actions to be included in the rolling work programme, all the proposed actions must specify the contribution expected to be made to the higher political priorities of the EU, such as the DSM. Where applicable, the rolling work programme details the contribution of specific actions to the third pillar of the DSM Strategy, which also includes support for an inclusive digital society.
Security, respect for privacy and data protection	Where appropriate, the descriptions of actions included in the rolling work programme must specify the measures taken to ensure security, respect for privacy and data protection.
Multilingualism	Examples of ISA ² actions producing tools and frameworks that contribute to multilingualism include: "SEMIC"; "PMKI"; "Development of an open data service, support and training package in the area of linked open data, data visualisation and persistent identification", "EUSurvey" and "EU CAPTCHA".
Administrative simplification and modernisation	Administrative simplification and modernisation are taken into consideration in the rolling work programme of ISA ² under the section "main impact list". The detailed list of expected impacts for each action indicates the extent to which the proposed actions contribute to this aspect. An example is the "Legal interoperability" action, which dedicates resources to streamline the European Commission's regulatory reporting practice thus cutting back administrative burden.
Transparency	The transparency of ISA ² actions is ensured by various channels: i) the rolling work programme provides an overview of the objectives of the actions, the planned and developed solutions, the expected impacts, and the budget allocated to each action; ii) the ISA ² Dashboard provides

¹¹⁸ Decision (EU) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA² programme) as a means for modernising the public sector.

¹¹⁹ Additional information on the user-centricity in the "NIFO" action can be found on the [Rolling Work Programme](#);

¹²⁰ "CAPTCHA" stands for "Completely Automated Public Turing Test to tell Computers and Humans Apart" and it represents a test that is expected to be difficult for machines to complete correctly, but possible for humans to complete correctly.

Art. 4(b) Principles	Relevant evidence
	quarterly updates regarding the efficiency and effectiveness of actions, in terms of costs, earned value management, effectiveness indicators and targets; iii) information on the level of take-up of solutions is made available via the ISA ² webpage dedicated to solutions; and iv) the solutions developed can be accessed via the Joinup platform.
Preservation of information	The "Library" section of the ISA ² website ensures the preservation of information about ISA ² in various formats: presentations, videos, publications, infographics and posters, leaflets, training course materials, press releases and articles, ISA ² work programmes, speeches, and official documents. Moreover, an ISA ² action "Standards-based archival data management, exchange and Publication" contributes to the Preservation of information principle by proposing standards for facilitating preservation and exchange of archival information.
Openness	The publication of ISA ² solutions on Joinup ensures that solutions are openly available for (potential) users. For example, the "European Interoperability Architecture" action through its EIRA solution promotes and support Openness and Transparency principles.
Re-usability and avoidance of duplication	As part of the proposal process for actions to be included in the rolling work programme, the descriptions of proposed actions specify (i) the extent to which the action re-uses other readily available solutions and (ii) the reusability of the action outputs. An example is the "Interoperability Academy" action, which re-uses already developed solutions by other ISA ² actions. In addition, "JoinUp" serves, among others, as a platform for sharing interoperability solutions and facilitating their re-use.
Technological neutrality, solutions which, insofar as possible, are future-proof, and adaptability	The section "Contribution to the interoperability landscape" of the rolling work programme describes, among others, the contributions brought by actions to the EIF, one aspect of which is technological neutrality, future-proof solutions and adaptability. As such, this principle is already taken into account in the proposal phase.
Effectiveness and efficiency	The ISA ² Dashboard provides quarterly data regarding the efficiency and effectiveness of actions. The historic data can be accessed together with the most recent data available.

Source: CEPS (2019), *Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²)*, European Commission; ISA² Rolling Work Programmes.

Annex G.7 Contribution of sampled ISA2 actions to the Digital Single Market

This annex outlines the contribution of the sampled ISA² to the three pillars of the DSM Strategy,¹²¹ seeing as interoperability is a key enabler of digitalisation in the Single Market. The programme's actions have contributed to specific areas of the DSM Strategy from the perspective of interoperability as a key enabler of digitalisation. The assessment contributes to the evaluation of the EU added value criterion.

Table 21 ISA² contribution to Pillar I of the DSM Strategy

Action number	Action name	Contribution to Pillar I: Better access for consumers and businesses to online goods and services across Europe
2016.29	Catalogue of Services	Obliges Member States to create Points of Single Contact with combined information for business setup and other citizen formalities.
2016.07	SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	Semantic interoperability is a prerequisite for enacting most levels of systems' interoperability, including the once-only principle and ensuring open data.
2016.16	Public Multilingual Knowledge Management Infrastructure for the DSM	The creation of a Public Multilingual Knowledge Infrastructure will support EU public administrations in creating services that can be accessible and shareable regardless of the language actually used, allowing SMEs to sell goods and service cross-border in a DSM.

¹²¹ COM(2015) 192 final, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions, A Digital Single Market Strategy for Europe.

2016.37	IMAPS	IMAPS helps public administrations to assess interoperability of public service and further improve the levels of interoperability.
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Source: CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission; ISA² Rolling Work Programmes.

Table 22 ISA² contribution to Pillar II of the DSM Strategy

Action number	Action name	Contribution to Pillar II: Creating the right conditions for digital networks and services to flourish
2016.06	Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System	A reusable solution for the dissemination of statistics for use by any administration to reduce the cost of dissemination and improve the delivery of data to public consumers
2016.05	European Public Procurement Interoperability Initiative	The activities supported by this action help to further create or improve standards regarding public procurement and encourage Member States to shift towards full eProcurement
2016.20	Joinup-European Collaborative Platform and Catalogue	Joinup creates a central platform for observatory functionalities, collaborative features, and interoperability solutions
2017.01	Standard-Based Archival Data Management, Exchange and Publication	The activities supported by this action aims to ensure proper managing, exchanging and opening to the public of archived-digitally generated public documents. Thereby, facilitates cross-border and cross-sector interactions related to the archival data

Source: CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission; ISA² Rolling Work Programmes.

Table 23 ISA² contribution to Pillar III of the DSM Strategy

Action number	Action name	Contribution to Pillar III: Maximising the growth potential of our European Digital Economy
2016.19	e-TrustEx	Acts as a broker in the exchange of data and documents to foster greater and secure interaction across heterogeneous systems
2016.16	Public Multilingual Knowledge Management Infrastructure for the DSM	The creation of a Public Multilingual Knowledge Infrastructure will support EU public administrations in creating services that can be accessible and shareable regardless of the language actually used, allowing SMEs to sell goods and service cross-border in a DSM.
2016.15	FISMA: Financial Data Standardisation	Looks to work on ICT standardisation to reduce administrative costs of legacy and data systems in the financial sector.
2016.18	Development of an Open Data Service, Support, and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	Open government data is a core asset for the knowledge-based economy, since its re-use is a basis for innovative information products and services as it is a key enabler for transparency, evidence-based decision-making and a broader participation in the political discourse. This package will enable administrations to enhance their data visualisation capacity, to further open up their data as well as to increase data quality and interoperability in view of better data reusability.
2016.03	Big Data for Public Administrations	This action addresses the need to provide the right framework conditions for a single market for big data and cloud computing as a means for helping to accelerate the transition towards a data-driven economy.
2016.05	European Public Procurement Interoperability Initiative	This action contributes to the development of the single electronic public procurement market in the EU by providing and supporting interoperability standards and interoperability initiatives in the field of electronic public procurement.
2016.14	European Citizens' Initiatives and European Parliament Elections	This action enhances existing solutions for European Citizen Initiatives by facilitating the verification of the statements of support and by developing new solutions for improvement of European Citizen Initiatives and European Parliamentary Elections.
2016.10	European Location Interoperability Solutions for e-Government (ELISE)	This action contributes to the interoperability landscape by ensuring that the 'location' dimension has an impact, adds

Action number	Action name	Contribution to Pillar III: Maximising the growth potential of our European Digital Economy
		value and is appropriately addressed within solutions across borders and sectors.
2016.23	Legal Interoperability	The action has a horizontal value as it can be used for the law-making/evaluation of every EU policy. It especially makes an indirect contribution to the DSM, as the more the action is used in assessing EU legislations the more digital and interoperable they become
2016.32	European Interoperability Architecture (EIA)	The EIA looks to maintain the EIRA, an interoperability reference that is key to the once-only principle
2016.21	NIFO	The EIF and the EIF Implementation Strategy foster interoperability and contribute to the DSM. By contributing to the implementation of the EIF, this action is relevant for the DSM.
2016.35	EUSurvey	By offering an easy means of collecting opinions and information between heterogeneous parties, the EUSurvey considerably facilitates the organisation and consolidation of any types of 'feedback-based' decision
2017.01	Standard-Based Archival Data Management, Exchange and Publication	By clarifying and supporting technical standards for archival management, it will ensure better access to digital goods and services and by providing access to Commission archives in Open Data format it will generate value, allowing the re-use of this information producing new products and services.
2019.01	Interoperability Academy	Interoperability Academy creates the right conditions for better digital public services by developing digital skills of public servants, providing learning opportunities and increasing user awareness on interoperability
2016.30	Raising Interoperability Awareness-Communication Activities	Communicating the ISA ² programme and its results reinforces the programmes contributions to the DSM, the eGovernment action plan, the EIS and the new EIF, but also the Open Data Initiative of the European Union and INSPIRE, among other.

Source: CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission; ISA² Rolling Work Programmes.

Annex G.8 Contribution of sampled ISA² actions to the European Interoperability Framework and the Interoperability Action Plan

This annex links the sampled ISA² actions to the [EIF](#) and the [IAP](#) by describing relevant contributions to implementing the EIF and the IAP. The assessment contributes to the evaluation of the EU added value criterion.

While the EIF provides principles, models and associated recommendations to help improve the delivery of interoperable digital public services, the IAP outlined specific actions to be undertaken between 2017 and 2020. Based on the analysis of sampled actions, Table 24 provides an overview of the contribution of ISA² actions to the implementation of the EIF and the IAP.

As the ISA² programme was one of the main implementing instruments of the IAP, it is worth exploring to what extent the ISA² actions contributed to implementing the actions listing in the IAP within the timeframe mentioned.

There are **direct links** between several sampled ISA² actions and the IAP actions:

- **“Legal Interoperability”**: The "Legal Interoperability" action supports policymaking across policy areas, bringing to the forefront the importance of considering potential digital impacts and the role of interoperability when developing new legislation. This ISA² action implements:
 - **Action 3 of the IAP**, by raising awareness on the importance of considering interoperability early on in the legislative process and by developing a methodology for legal interoperability screening;

- **Actions 19 and 20 of the IAP**, by having put forward guidelines for ICT impact assessment as part of the Better Regulation Toolbox (Tool #27) and guidelines for digital-ready policy proposals.
- **“NIFO”**: The NIFO action has contributed to **Actions 4 and 5 of the IAP** by monitoring the state of play of interoperability, developing the EIF Monitoring Mechanism and the EIF Toolbox to support the implementation of the EIF.¹²²
- **“Raising Interoperability Awareness - Communication Activities”**: The communication activities implement **Action 8 of the IAP**, ensuring the dissemination of information about interoperability, ISA² and the EIF.
- **“Joinup”**: The action facilitates the sharing and re-use of solutions for public administrations and provides the stakeholders with the means to collaborate via a collaborative platform. The activities conducted as part of the "Joinup" action have contributed to **Action 10 of the IAP**, which explicitly asked for "maintaining, improving and animating the Joinup platform for better user engagement and community building", as well as **Action 21**.
- **“Catalogue of services”**: The Catalogue of Services is one of the interoperability enablers for integrated public services according to the conceptual model defined by the revised EIF. The Catalogue of Services responds in particular to **Action 13 of the IAP**.
- **“EIA”**: The "EIA" action implements **Action 22 of the IAP**, by ensuring the further development of the EIRA and the Cartography Tool and providing new versions of the architecture.

In addition to examples from the sampled actions, two additional ISA² actions stand out as having a clear link to the IAP. These actions are:

- The **“Access to Base Registries”** in relation to Action 12 of the IAP (“Define and implement common specifications on the terms and conditions for accessing and managing base registries”);
- The **“Sharing and Re-use”** action in relation to Action 21 of the IAP (“Maintain and promote the ‘sharing and re-use framework for IT solutions’ (including open source) developed in the context of the ISA² programme”).

Beyond the clear links, ISA² actions also have **overarching contributions** to the IAP actions:

- **“Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification”**: The action supports open data initiatives by facilitating data re-use and sharing and offering tools to visualise data effectively. The action contributes to several priorities listed in the IAP: organisational interoperability (**Actions 6 and 7**); sharing of good practices (**Action 11**); governance structure (**Action 2**) and key enablers focused on EU open data initiative (**Action 14**).
- **“Interoperability Academy”**: This action was established in order to help increase awareness of interoperability, the EIF and the solutions developed under ISA². The action facilitates access to information and learning material in this sense. The Interoperability Academy contributes primarily to **Actions 5, 8, 11 of the IAP**.

Table 24 ISA² contribution to the EIF and the IAP

Package	Action number	Action Name	Contribution to the EIF and the IAP
1. Key and generic	2016.19	Trusted Exchange	e-TrustEx is a platform offered to public administrations at European, national and regional levels to undertake secure

¹²² The EIF Monitoring Mechanism, the EIF Toolbox and the reports and factsheet on the digital public administrations and interoperability can be consulted in the NIFO collection on Joinup: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/knowledge-centre>.

Package	Action number	Action Name	Contribution to the EIF and the IAP
interoperability enablers		Platform (e-TrustEx)	<p>exchange of natively digital documents or scanned documents from system to system via standardised interfaces.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action thus contributes particularly to Recommendation 15 of the revised EIF, through enabling the secure exchange of documents. Contribution to the IAP: The platform supports public administrations in implementing EU policies that require the electronic exchange of information, contributing to the implementation of the eIDAS Regulation among others. In this context, e-TrustEx contributes to Action 15 of the IAP.
1. Key and generic interoperability enablers	2016.29	Catalogue of Services	<p>The Catalogue of Services is one of the interoperability enablers for integrated public services according to the conceptual model defined by the revised EIF. To that end, the action is defining a technical specification (data model) and implementing a set of tools to facilitate the creation of catalogue of public services.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action addresses Recommendation 44 of the revised version of the EIF on the catalogue of public services. Contribution to the IAP: The Catalogue of Services responds in particular to Action 13 of the IAP.
2. Semantic interoperability	2016.07	SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	<p>The Action supports the implementation of the EIF and the EIS by promoting semantic interoperability, through the definition and use of common specifications.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action contributes primarily to Recommendation 16 of the revised EIF. In addition, the action covers the following underlying principles of the EIF: Reusability, Multilingualism, Openness, Semantic interoperability, Technical interoperability and Standardisation. Contribution to the IAP: SEMIC supports several actions of the IAP, including: 12, 13, 14, 18.
2. Semantic interoperability	2016.16	Public Multilingual Knowledge Management Infrastructure for the DSM	<p>The creation of a Public Multilingual Knowledge Infrastructure aims to support EU public administrations in creating services that can be accessible and shareable independently from the language actually used, as well as allowing SMEs to sell goods and service cross-border in a DSM.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action is based on several recommendations (primarily Recommendation 16 on taking into account multilingualism in the setting up of European public services) and principles of the new EIF, in particular those concerning multilingualism, accessibility, administrative simplification, transparency, and reusability of the solutions. Contribution to the IAP: This action contributes to Action 7 of the IAP, with its focus on the particular area of multilingualism to improve the delivery of services and exchange of information.
3. Access to data/data sharing/open data	2016.03	Big Data for Public Administrations	<p>This action will facilitate the sharing of open data between public administrations through the support to the execution of analytics projects on Big Data; increase the transparency of decision-making in public administrations by supporting knowledge sharing on evidence-based policy-making practices; support the re-use of open source data analytics tools developed by Member States of EU Institutions; and provide public administrations with the opportunity to test (open source) technologies in this domain before making a decision on the technical way forward.</p> <ul style="list-style-type: none"> Contribution to the EIF: This action contributes to several EIF principles including "openness", "transparency", "reusability" and "technological neutrality". Contribution to the IAP: This action contributes primarily to Action 14 of the IAP.
3. Access to data/data	2016.06	Sharing Statistical	<p>This action contributes to several areas: developing, maintaining and promoting interoperable solutions for the</p>

Package	Action number	Action Name	Contribution to the EIF and the IAP
sharing/open data		Production and Dissemination Services and Solutions in the European Statistical System	<p>production and dissemination of statistics by EU public administrations (including the EC) and 2) developing, maintaining and promoting a) a specification of the EIRA to support better interoperability and cooperation for the production and dissemination of Official Statistics in the European Statistical System; b) a common infrastructure for the exposure and consumption of shared statistical services. In addition, the proposal contributes significantly to the realisation of the ESS Vision 2020 objectives in the domain of sharing tools and improving statistical dissemination.</p> <ul style="list-style-type: none"> Contribution to the EIF: Through its focusing on aligning infrastructures for shared statistical services, the action builds on the principles and recommendations of the EIF, in particular Recommendation 36. Contribution to the IAP: The activities undertaken as part of, this action feed into Actions 7 9, 22.
3. Access to data/data sharing/open data	2016.18	Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	<p>The action supports open data initiatives by facilitating data re-use and sharing and offering tools to visualise data effectively.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action contributes to the new EIF, namely the interoperability principles: openness, transparency, reusability, user-centricity and multilingualism, accessibility. Contribution to the IAP: The action contributes to several priorities listed in the IAP: organisational interoperability (Actions 6 and 7); sharing of good practices (Action 11); governance structure (Action 2) and key enablers focused on EU open data initiative (Action 14).
4. Geospatial solutions	2016.10	European Location Interoperability Solutions for e-Government (ELISE)	<p>ELISE has aimed to deepen the understanding of location interoperability enablers and barriers related to the transition towards digital government.</p> <ul style="list-style-type: none"> Contribution to the EIF: ELISE builds on several areas of the EIF including openness, reusability, technological neutrality, user-centricity, multilingualism, and administrative simplification. Contribution to the IAP: ELISE brings contributions in particular to Action 17, through its support for the implementation of the INSPIRE Directive. ELISE also contributes to Actions 4, 6 & 19.
5. eProcurement/eInvoicing - Supporting instruments	2016.05	European Public Procurement Interoperability Initiative	<p>This action supports several activities designed to simplify procurement and facilitate the participation in online procurement as well the re-use of data in the field.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action builds in particular on Recommendations 28 and 30 of the EIF, as well as facilitating the implementation of the once-only principle in the area of public procurement. Contribution to the IAP: The "European Public Procurement Interoperability Initiative" contributes in particular to actions 1, 7, 18.
6. Decision making and legislation - Supporting instruments	2016.23	Legal interoperability (former ICT Implications of EU Legislation)	<p>The "Legal Interoperability" action supports policymaking across policy areas, bringing to the forefront the importance of considering potential digital impacts and the role of interoperability when developing new legislation.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action implements Recommendation 27 on legal interoperability of the new EIF. Contribution to the IAP: This ISA² action implements action 3 of Focus Area 1 on the governance and coordination of interoperability initiatives, and actions 19 and 20 of Focus Area 5 on supporting instruments for interoperability.
6. Decision making and legislation - Supporting instruments	2017.04	Inter-Institutional Register of Delegated Acts (RegDel)	<p>This action focused on developing an IT tool setting up the Inter-Institutional Register of Delegated Acts, increasing transparency around delegated acts and thus responding to the 2016 commitment of the Commission in this sense.</p> <ul style="list-style-type: none"> Contribution to the EIF: This action contributes primarily to the transparency principle of the EIF and

Package	Action number	Action Name	Contribution to the EIF and the IAP
			<p>to Recommendation 5 of the new EIF by providing a transparent overview of delegated acts.</p> <ul style="list-style-type: none"> Contribution to the IAP: This action, by enhancing inter-institutional governance, contributes to Action 1 of the IAP.
8. Supporting instruments for public administrations	2016.20	Joinup – European Collaborative Platform and Catalogue	<p>The action facilitates the sharing and re-use of solutions for public administrations and provides the stakeholders with the means to collaborate via a collaborative platform.</p> <ul style="list-style-type: none"> Contribution to the EIF: “Joinup” builds especially on the reusability principle of the EIF, facilitating access and supporting the re-use of available interoperable solutions. Contribution to the IAP: The activities ran as part of the “Joinup” action have contributed to Action 10 of the IAP, which explicitly asked for “maintaining, improving and animating the Joinup platform for better user engagement and community building”, as well as action 21.
8. Supporting instruments for public administrations	2016.21	NIFO	<p>The NIFO action has monitored interoperability initiatives in the Members and developed the Monitoring Mechanism to keep track of the implementation of the EIF Recommendations by Member States. NIFO has also developed an EIF Toolbox to support Member States in the implementation of the EIF.</p> <ul style="list-style-type: none"> Contribution to the EIF: NIFO provides an overarching contribution to the EIF, by helping monitor the alignment of national initiatives with the EIF and the implementation of the EIF in the Member States. The action responds to the commitment from the 2017 EIF Communication that called for the development of a framework for monitoring the implementation of the EIF. This was achieved with the development of the EIF Monitoring Mechanism as part of the NIFO action. Contribution to the IAP: NIFO has contributed to Actions 4 and 5 of the Action Plan.
8. Supporting instruments for public administrations	2016.32	European Interoperability Architecture (EIA)	<p>This action helps define the needs and shortcomings with relation to a common interoperability architecture for European public services and contribute to defining such an architecture as well as map reusable solutions and guidelines services as interoperability building blocks.</p> <ul style="list-style-type: none"> Contribution to the EIF: The “EIA” actions contribute in particular to Recommendation 23 of the EIF and to overall interoperability governance. Contribution to the IAP: The “EIA” action implements Action 22.
8. Supporting instruments for public administrations	2016.35	EUSurvey	<p>EUSurvey contributes primarily to the multilingualism principle of the EIF. As a survey tool widely used in EU policymaking, EUSurvey has also contributed to Action 11 of the IAP on the engagement of stakeholders in the development of digital public services.</p>
8. Supporting instruments for public administrations	2016.37	IMAPS	<p>This action supports tools for the assessment of the interoperability maturity level of digital public services, helping to identify improvement priorities.</p> <ul style="list-style-type: none"> Contribution to the EIF: This action contributes to the principles of reusability and user-centricity (in particular, Recommendation 12 of the EIF) by creating a mechanism for analysis, design, assessment and further development of the European Public Services. Contribution to the IAP: The IMAPS action contributes to action 20 of the IAP.
8. Supporting instruments for public administrations	2017.01	Standard-Based Archival Data Management, Exchange and Publication	<p>The action contributes to supporting data standards in the field of archival information management, studying among others how Open Data formats can be used in this area.</p> <ul style="list-style-type: none"> Contribution to the EIF: The action builds on several principles of the EIF including openness, transparency, reusability, technological neutrality, preservation of information, user-centricity.

Package	Action number	Action Name	Contribution to the EIF and the IAP
			<ul style="list-style-type: none"> Contribution to the IAP: This action contributes to implementing Action 14 of the IAP.
8. Supporting instruments for public administrations	2019.01	Interoperability Academy	<p>This action was established in order to help increase awareness of interoperability, the EIF and the solutions developed under ISA². The action facilitates access to information and learning material in this sense.</p> <ul style="list-style-type: none"> Contribution to the EIF: This action promotes the principle of reusability. In addition, it provides an overall contribution to the EIF, by promoting the principle, models, and recommendations of the Framework and facilitating access to information about implementing the EIF. Contribution to IAP: The Interoperability Academy contributes primarily to Actions 5, 8, 11 of the IAP.
9. Accompanying measures	2016.30	Raising Interoperability Awareness – Communication Activities	<ul style="list-style-type: none"> Contribution to the EIF: This action contributes to the principles of inclusion, accessibility and transparency by disseminating information about interoperability and the work of ISA². Contribution to the IAP: The communication activities implement Action 8 of the IAP.

Source: Authors' elaboration on information from the Rolling Work Programme and an extensive analysis of the objectives and outputs of actions cross-checked against the EIF and the IAP.

Annex G.9 Sustainability

The sustainability of ISA² solutions depends on the extent to which the solutions would require further maintenance and updating in order to continue to deliver results. Solutions may require lower or higher levels of maintenance and updating depending on their type: solutions in the form of guidelines and specifications can remain as a reference point and may require updating to keep up with developments in the field, but software solutions will likely require more frequent maintenance and support for them to remain accessible and useful. This annex thus outlines the expected level of maintenance or need for updates for the solutions of the sampled actions, based on the general principle that software solutions would require more maintenance and updating while solutions in the forms of guidelines and specifications would require a relatively lower level of maintenance and update, while acknowledging that in keeping up with technological developments updates may become nevertheless necessary. The assessment is based on desk research and independent expert assessments, contributing to assessing the sustainability criterion.

Table 25 Overview of the sustainability of the solutions of sampled ISA² actions

Package	ISA / ISA ²	Action	Solution	Lower maintenance / less frequent update	Higher maintenance / more frequent update
1. Key and generic interoperability enablers	ISA	2016.19	e-TrustEx		X
1. Key and generic interoperability enablers	ISA	2016.29	CPSV-AP	X Note: In general such models need fewer updates, but 2018 was the latest update; it could need a further update.	
2. Semantic interoperability	ISA	2016.07	ADMS	X Note: As ADMS was launched in 2013, the need for an update may be considered.	
2. Semantic interoperability	ISA	2016.07	Core vocabularies	X Note: While constant maintenance may not be necessary, relevant updates need to be	

Package	ISA / ISA ²	Action	Solution	Lower maintenance / less frequent update	Higher maintenance / more frequent update
				considered to ensure new developments are accounted for.	
2. Semantic interoperability	ISA	2016.07	DCAT-AP	X Note: While constant maintenance may not be necessary, relevant updates need to be considered to ensure new developments are accounted for.	
2. Semantic interoperability	ISA	2016.07	VocBench3		X
2. Semantic interoperability	ISA ²	2016.16	PMKI Core data model for multilingual taxonomies/ terminologies	X Note: While constant maintenance may not be necessary, relevant updates need to be considered to ensure new developments are accounted for.	
2. Semantic interoperability	ISA ²	2016.16	Semantic Links	X Note: While constant maintenance may not be necessary, relevant updates need to be considered to ensure new developments are accounted for.	
3. Access to data/data sharing/open data	ISA ²	2016.06	ESS Service		X Note: Statistical services have to updated more often to changes in the economy and society
3. Access to data/data sharing/open data	ISA ²	2016.18	Data Visualisation Tools Catalogue	X Note: On the one hand, visualisation tools should be established as standards to increase their use, but they also need to be adapted to new technological developments and new data sources as relevant.	
4. Geospatial solutions	ISA	2016.10	Re3gistry		X
4. Geospatial solutions	ISA	2016.10	EULF Blueprint	X Note: The fourth version was released in September 2020. Updates as necessary need to be considered.	
4. Geospatial solutions	ISA	2016.10	Studies on Location information (ELISE)	X	
5. eProcurement/ eInvoicing - Supporting instruments	ISA	2016.05	Open e-Prior		X
5. eProcurement/ eInvoicing - Supporting instruments	ISA	2016.05	eCertis		X
5. eProcurement/	ISA	2016.05	ESPD		X

Package	ISA / ISA ²	Action	Solution	Lower maintenance / less frequent update	Higher maintenance / more frequent update
eInvoicing - Supporting instruments					
6. Decision making and legislation - Supporting instruments	ISA	2016.23	Digital screening mentioned in Tool #27 of the Better Regulation (BR) Toolbox: The digital economy and society & ICT issues	X Note: Generally, Tool #27 serves to guide the policymaking process, thus it remains as a reference in the field. A major overhaul of the tool has been ongoing since 2020 – in line with the Commission's intention to update its BR toolbox by summer 2021.	
6. Decision making and legislation - Supporting instruments	ISA	2016.23	ICT Impact Assessment Guidelines (updated)	X Note: Generally, the guidelines serve to guide the policymaking process, thus they remain as a reference in the field. As ICT impacts are changing, and digital is more and more present in policymaking, an update of the tool may be due in the coming years.	
6. Decision making and legislation - Supporting instruments	ISA	2016.23	Decision supporting tool on interoperability	X Note: Generally, the tool contains high-level considerations for the attention of decision-makers, which are rather future-proof.	
6. Decision making and legislation - Supporting instruments	ISA ²	2017.03	REFIT Platform IT Tool		X Note: The REFIT Platform needs to be updated to keep up with the evolving needs of the Commission. A new platform – Fit for Future – is currently under development, based on the REFIT Platform.
6. Decision making and legislation - Supporting instruments	ISA ²	2017.04	RegDel		X
7. EU Policies - Supporting instruments	ISA	2016.14	Online Collection Software to support European Citizens' Initiative		X Note: The OCS was updated in 2019, but importantly, this is an instance of a very dynamic software.
7. EU Policies - Supporting instruments	ISA	2016.14	European Parliament Crypto Tool		X
8. Supporting instruments for public administrations	ISA	2016.20	Joinup		X
8. Supporting instruments for public administrations	ISA	2016.21	NIFO Digital public administration factsheets		X Note: Updates are necessary due to the

Package	ISA / ISA ²	Action	Solution	Lower maintenance / less frequent update	Higher maintenance / more frequent update
					continual monitoring aspects of the action.
8. Supporting instruments for public administrations	ISA	2016.32	EIRA and CarTool	X Note: While constant maintenance may not be necessary, relevant updates need to be considered to ensure new developments are accounted for.	
8. Supporting instruments for public administrations	ISA	2016.35	EUSurvey		X
8. Supporting instruments for public administrations	ISA	2016.37	IMAPS	X	
8. Supporting instruments for public administrations	ISA ²	2017.01	Study on Standard-based Archival Data Management, Exchange, and Publication	X	
8. Supporting instruments for public administrations	ISA ²	2017.01	Assessment tool offering support for the selection of IT solutions for archives management	X	
8. Supporting instruments for public administrations	ISA ²	2019.01	Interoperability Academy Winter School		X Note: This assessment is based on the extent to which the Winter School would be repeated every year.
8. Supporting instruments for public administrations	ISA ²	2019.01	Interoperability Academy Catalogue of Educational Training Resources	X Note: A lower level of maintenance may be sufficient, to the extent to which this solution relies on other tools and instruments and facilitate their dissemination.	

Source: Authors' elaboration based on the ISA² [Actions](#) and [Solutions](#) webpages, [Joinup](#) and [the ISA² Work Programme 2020](#).

Annex G.10 Academic and grey literature outlining the needs and problems in the field of interoperability

This annex presents an overview of the academic and grey literature supporting the assessment of the needs and problems tackled by ISA², thus contributing to the evaluation of the relevance criterion.

Table 26 Literature review: needs and problems in the field of interoperability

ISA ² identified needs and problems	Studies, reports and articles that substantiate the existence of specific needs and problems
The need for public administrations to cooperate to enable more efficient and secure public services	<ul style="list-style-type: none"> Kalvet et. al (2018), <i>Cross-border e-Government Services in Europe: Expected Benefits, Barriers and Drivers of the Once-Only Principle</i>. In Proceedings of the 11th International

ISA ² identified needs and problems	Studies, reports and articles that substantiate the existence of specific needs and problems
	<p>Conference on Theory and Practice of Electronic Governance (ICEGOV '18)</p> <ul style="list-style-type: none"> • Tinholt et al. (2013), <i>Study on Analysis of the Needs for Cross-Border Services and Assessment of the Organisational, Legal, Technical and Semantic Barriers</i>. Publications Office of the European Union; • De Abreu (2017), <i>Digital Single Market under EU political and constitutional calling: European electronic agenda's impact on interoperability solutions</i>. EU Law Journal. Vol. 3, No. 1, January 2017 • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research; • Cave et. al. (2017), <i>EU-wide digital Once-Only Principle for citizens and businesses: Policy options and their impacts</i>. Publications Office of the European Union; • Masciotta (2019), <i>A strategy on the interoperability issue within the P.A. from the Italian constitutional perspective</i>. ITALIAN J. PUB. L. 689 (2019); • Kourabali and Katehakis (2019), <i>The new European interoperability framework as a facilitator of digital transformation for citizen empowerment</i>. Journal of Biomedical Informatics 94 • JRC(2020), <i>Assessing the impacts of digital government transformation in the EU</i>. Publications Office of the European Union.
<p>The need for public administrations to exchange information to fulfil legal requirements or political commitments</p>	<ul style="list-style-type: none"> • Kalvet et. al. (2018), <i>Cross-border e-Government Services in Europe: Expected Benefits, Barriers and Drivers of the Once-Only Principle</i>. In Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance (ICEGOV '18) • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>. Publications Office of the European Union • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research; • JRC(2020), <i>Assessing the impacts of digital government transformation in the EU</i>. Publications Office of the European Union.
<p>The need for public administrations to share and re-use information to improve administrative efficiency and cut red tape for citizens and businesses</p>	<ul style="list-style-type: none"> • Kalvet et. al. (2018), <i>Cross-border e-Government Services in Europe: Expected Benefits, Barriers and Drivers of the Once-Only Principle</i>. In Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance (ICEGOV '18) • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>; Publications Office of the European Union, 2021. Publications Office of the European Union • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research; • Gallo et. al. (2014) <i>Study on eGovernment and the Reduction of Administrative Burden</i>. Publications Office of the European Union, • Cave et. al. (2017), <i>EU-wide digital Once-Only Principle for citizens and businesses: Policy options and their impacts</i>. Publications Office of the European Union;
<p>Administrative e-barriers are leading to the fragmentation of the internal market</p>	<ul style="list-style-type: none"> • Cave et. al. (2017), <i>EU-wide digital Once-Only Principle for citizens and businesses: Policy options and their impacts</i>. Publications Office of the European Union;

ISA ² identified needs and problems	Studies, reports and articles that substantiate the existence of specific needs and problems
	<ul style="list-style-type: none"> • Gallo et. al. (2014) <i>Study on eGovernment and the Reduction of Administrative Burden</i>. Publications Office of the European Union; • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>; • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>;
Needs for digitalisation and cooperation deriving from or exacerbated by the COVID-19 pandemic	<ul style="list-style-type: none"> • Charay et. al. (2021), <i>Report on Public Administrations' Digital Response to COVID-19 in the EU</i>, Publications Office of the European Union, 2021 • Renda and Castro (2020), <i>Towards Stronger EU Governance of Health Threats after the COVID-19 Pandemic</i>, European Journal of Risk Regulation, 11 (2020), pp. 273–282. Cambridge University Press • Ciucci and Gouardères (2020), <i>National COVID-19 contact tracing apps</i>. Briefing Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament Briefing • Politis et. al. (2021), <i>On an innovative architecture for digital immunity passports and vaccination certificates</i>. IEEE Network • Mithani et. al. (2021), <i>A scoping review of global vaccine certificate solutions for COVID-19</i>. Preprint, Research Square • Gstrein et. al. (2021), <i>A Terrible Great Idea? COVID-19 'Vaccination Passports' in the Spotlight</i>. Working Paper No. 153 The Centre on Migration, Policy & Society University of Oxford (2021)
The need for digital literacy and skills to ensure that the tools developed can also be used effectively and thus improve take-up	<ul style="list-style-type: none"> • Tinholt et al. (2013), <i>Study on Analysis of the Needs for Cross-Border Services and Assessment of the Organisational, Legal, Technical and Semantic Barriers</i>. Publications Office of the European Union; • Taipale (2012), <i>The use of e-government services and the Internet: The role of socio-demographic, economic and geographical predictors</i>. Telecommunications Policy 37 (2013) 413 • Misuraca et. al. (2020), <i>Exploring Digital Government Transformation in tThe EU</i>. Publications Office of the European Union; • Gallo et. al. (2014) <i>Study on eGovernment and the Reduction of Administrative Burden</i>. Publications Office of the European Union; • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research; • JRC(2020), <i>Assessing the impacts of digital government transformation in the EU</i>. Publications Office of the European Union; • Chinn et. al. (2020), <i>The future is now: Closing the skills gap in Europe's public sector</i>, McKinsey & Company
The need for extended diffusion of the digital identity	<ul style="list-style-type: none"> • Tinholt et. al. (2013) <i>Study on Analysis of the Needs for Cross-Border Services and Assessment of the Organisational, Legal, Technical and Semantic Barriers</i>. Publications Office of the European Union; • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research; • Cave et. al. (2017), <i>EU-wide digital Once-Only Principle for citizens and businesses: Policy options and their impacts</i>. Publications Office of the European Union.;
The need to exchange best practices between Member States.	<ul style="list-style-type: none"> • Halmos (2018), <i>Cross-border digital public services, Cross Border Review 2018</i> Central European Service For Cross-Border Initiatives;

ISA ² identified needs and problems	Studies, reports and articles that substantiate the existence of specific needs and problems
	<ul style="list-style-type: none"> • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>. Publications Office of the European Union.
The need to ensure a feedback loop with citizens in order to improve the functioning of digital tools and solutions	<ul style="list-style-type: none"> • Misuraca et. al. (2020), <i>Exploring Digital Government Transformation In The EU</i>. Publications Office of the European Union; • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>. Publications Office of the European Union.
The need for consistent governance of the different initiatives in the field of interoperability at the EU level.	<ul style="list-style-type: none"> • Sallamo et. al. (2020), <i>Recommendations for organising and governing integrated public services</i>. Publications Office of the European Union; • Lakka et. al. (2012), <i>What drives eGovernment growth? An econometric analysis on the impacting Factors</i>. Int. J. Electronic Governance Vol. 6, No. 1, 2013 • Krimmer et. al. (2018), <i>Contributing to a Digital Single Market for Europe: Barriers and Drivers of an EU-wide Once-Only Principle</i>. Proceedings of the 19th Annual International Conference on Digital Government Research.

Source: Authors' elaboration.

Annex G.11 Contribution of the sampled ISA² actions to cross-border interoperability

This annex contributes to the assessment of the EU added value criterion. The annex describes the contribution of the 21 sampled actions to enhancing cross-border interoperability, based on the Interim Evaluation of the programme¹²³ and information available in the rolling work programme.

Table 27 Contribution of the sampled ISA² actions to cross-border interoperability

Package	Action number	Action name	Contribution to cross-border interoperability
1. Key and generic interoperability enablers	2016.19	Trusted Exchange Platform (e-TrustEx)	The e-TrustEx platform is currently used as a key element of pan-European messaging infrastructures for projects such as: e-PRIOR (DIGIT), DECIDE (SG), EDMA (COMP), eJustice Portal (JUST), OPOCE (OP), EU-CEG (DG SANTE). Around 200 public institutions across the 28 Member States are in scope of these projects (such as national parliaments and permanent representations).
1. Key and generic interoperability enablers	2016.29	Catalogue of Services	The CPSV-AP is already being used by public administrations in Belgium, Italy, Finland, and Estonia to create a cross-border federated catalogue of public services.
2. Semantic interoperability	2016.07	SEMIC: Promoting Semantic Interoperability Amongst the European Union Member States	The proposal will facilitate the cross-border interoperability thanks to its inherent support for multilingualism. Further cross-border interoperability improvements can be expected through the alignment of the generic EuroVoc thesaurus that covers the EU policy domains with specialised EU and national controlled vocabularies through VocBench. VocBench is already used by public administrations in France, Italy, the Netherlands and Scotland and interest has been expressed from public administrations in Belgium and Slovenia.
2. Semantic interoperability	2016.16	Public Multilingual	The objective of this action is to support enterprises and particularly the language technology industry

¹²³ CEPS (2019), Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens (ISA²), European Commission, pp. 154 – 156.

Package	Action number	Action name	Contribution to cross-border interoperability
		Knowledge Management Infrastructure for the DSM	with the implementation of the necessary multilingual tools and features in order to improve cross-border accessibility of e-Commerce solutions. The outputs in the form of semantic links developed so far contribute to the cross-border service interoperability from a semantic perspective.
3. Access to data/data sharing/open data	2016.03	Big Data for Public Administrations	In 2017, a long list of requirements has been collected from different Member States to understand their needs in the area of (Big) data analytics for policymaking, especially with regard to analytics use cases and infrastructure needs. The needs have been collected through a consultation of the ISA network, through the creation of a working group. Member States on board so far are: the Czech Republic, Estonia, Hungary, Malta, Norway, Slovenia, Spain, and Portugal. The working group has shown significant interest in the action and its outputs. Additionally, the action has been presented to the ESS Big Data Task Force: the representatives have highlighted their interest in the action and shown availability to (re-)use its outcomes.
3. Access to data/data sharing/open data	2016.06	Sharing Statistical Production and Dissemination Services and Solutions in the European Statistical System	The development of statistical services includes a broad international community. In the ESS, 14 Member States are actively involved in a Task Force and a consortium of six Member States (FR, PT, UK, LT, DE, SI) has been set up to provide input and take part in the development of the guidelines for sharing of statistical services and to implement the re-use of developed solutions and services with the European Commission. In the architecture domain, the ESS reference architecture in its current state has been adopted by the 28 NSIs CIOs and Heads of Methodology. Its upgrading towards greater interoperability through more standards and deeper architectural guidance is done in collaboration with an ESS EA Board involving five Member States.
3. Access to data/data sharing/open data	2016.18	Development of an Open Data Service, Support and Training Package in the Area of Linked Open Data, Data Visualisation and Persistent Identification	Member States can consult and re-use the project outputs (knowledge base, trainings, the description of the tools and projects included in the catalogue of data visualisation tools).
4. Geospatial solutions	2016.10	European Location Interoperability Solutions for e-Government (ELISE)	Road safety data-exchange solutions piloted and implemented in Norway and Sweden are being rolled-out to five other Member States using CEF funds, with more rollouts planned. INSPIRE Registry services have 450k accesses per quarter.*
5. eProcurement/ eInvoicing - Supporting instruments ¹²⁴	2016.05	European Public Procurement Interoperability Initiative	ePrior is used by several EU bodies and some components are used by the Belgian administration. In particular, in the EU Bodies context, economic operators using the ePrior system are from various EU countries. For eCertis: Roughly 25 services in the EU are retrieving data from eCertis, using the CEF eProc DSI. Other services will follow. For ESPD services: Private and public entities from roughly 17 Member States have participated in the CEF eProc DSI Others are using Structural Funds to implement an ESPD service. They all have implemented ESPD services using the ESPD data model or the open source code developed under the ISA ² project.

¹²⁴ The overview was updated based on additional feedback received from action owners.

Package	Action number	Action name	Contribution to cross-border interoperability
			Currently roughly 74 entities are providing an ESPD services in 25 Member States (Norway as well).
6. Decision making and legislation - Supporting instruments	2017.03	REFIT Platform	The REFIT Platform consists of two Commission expert groups: a Government group in which all Member States are represented, and a Stakeholder group with representatives of businesses, social partners, civil society organisations in various Member States, the Economic and Social Committee and the European Committee of the Regions.
7. EU Policies - Supporting instruments	2016.14	European Citizens' Initiatives and European Parliament Elections	ECI-OCS serves the citizens and public administrations in all Member States as it facilitates the verification of the statements of support for legislation. The European Parliament Crypto tool is useful to the public administrations of all the Member States
8. Supporting instruments for public administrations	2016.20	Joinup – European Collaborative Platform and Catalogue	The end-users of Joinup are from different EU Member States and countries outside the EU (USA, Canada, New Zealand). In addition, several national repositories (NL, ES, EL, SL, BE) are stored on Joinup, making their national solutions available for re-use.
8. Supporting instruments for public administrations	2016.21	NIFO	The outputs of NIFO have already been re-used by various Member States. The eGovernment factsheets are considered as a reference. The state of play reports on interoperability in Europe and the NIFO factsheets served as a source of input in the revision of the EIF and the IAP.
8. Supporting instruments for public administrations ¹²⁵	2016.32	European Interoperability Architecture (EIA)	EIRA has been deployed in EE, NL, DK, ES, CZ, PL, BE, SE, NO, IT, and FI.
8. Supporting instruments for public administrations	2016.35	EUSurvey	EUSurvey is available in 23 EU languages, facilitating cross-border interoperability. In 2017, more than 7,800 surveys have been created with the tool, resulting in more than 2.7 million contributions.
8. Supporting instruments for public administrations	2017.01	Standard-Based Archival Data Management, Exchange and Publication	The action addresses the semantic interoperability issue of how to describe electronic archives by means of the identification of existing standards for digital archives, facilitating the cross-border interoperability of electronic archives.
8. Supporting instruments for public administrations	2019.01	Interoperability Academy Winter School	These action has, by definition, a cross-border approach. It provides learning resources for public administrations at all levels (EU, national, sub-national), aims to enhance collaboration with international, national, or regional initiatives, and promotes the importance of interoperability across the EU.
9. Accompanying measures	2016.3	Raising Interoperability Awareness – Communication Activities	This action contributes to the promotion of interoperability across the EU.

Source: CEPS (2019), Interim evaluation; additional information based on the rolling work programme.

Annex G.12 Supporting evidence for the assessment of the efficiency of the programme

This annex provides an overview of the underlying data used to compute the average costs for preparing a new or a renewed proposal for an ISA² action, supporting the analysis presented in Chapter 6. The assessment is based on data collected during the interim evaluation as well as the final evaluation of the programme.

¹²⁵ The overview was updated based on additional feedback received from action owners.

Table features the reported number of person-days spent to prepare a new or a renewed proposal, the hourly labour costs for the service sector at the Member State level based on Eurostat data, and the total estimated cost per answer collected, where the cost is the result of the person-days multiplied by the hourly rate, multiplied by 8 (assuming an average working day of 8 hours).

Table 28 Time and labour cost for preparing a new or renewed proposal as part of the ISA² programme

Source	Person-days	Type of proposal	Labour cost (hourly rate in EUR)	Cost (in EUR)
Final evaluation consultations	25	New proposal	27.6	5520
Final evaluation consultations	20	New proposal	39.9	6384
Final evaluation consultations	2.5	Renewed proposal	39.9	798
Final evaluation consultations	4	Renewed proposal	39.9	1276.8
Final evaluation consultations	5	Renewed proposal	45.6	1824
Final evaluation consultations	10	New proposal	39.9	3192
Final evaluation consultations	3	Renewed proposal	39.9	957.6
Final evaluation consultations	20	New proposal	45.6	7296
Final evaluation consultations	5	Renewed proposal	39.9	1596
Interim evaluation consultations	10	New proposal	39.9	3192
Interim evaluation consultations	2	Renewed proposal	39.9	638.4
Interim evaluation consultations	10	New proposal	39.9	3192
Interim evaluation consultations	2	Renewed proposal	39.9	638.4
Interim evaluation consultations	2.5	Renewed proposal	45.6	912
Interim evaluation consultations	5	Renewed proposal	39.9	1596
Interim evaluation consultations	1	Renewed proposal	39.9	319.2
Interim evaluation consultations	30	New proposal	45.6	10944
Interim evaluation consultations	24	New proposal	39.9	7660.8
Interim evaluation consultations	1	Renewed proposal	39.9	319.2
Interim evaluation consultations	5	Renewed proposal	39.9	1596
Interim evaluation consultations	5	Renewed proposal	39.9	1596
Interim evaluation consultations	4	Renewed proposal	39.9	1276.8
Interim evaluation consultations	3	Renewed proposal	39.9	957.6
Interim evaluation consultations	20	New proposal	39.9	6384
Interim evaluation consultations	3	Renewed proposal	39.9	957.6
Interim evaluation consultations	10	New proposal	27.6	2208
Interim evaluation consultations	20	New proposal	39.9	6384
Interim evaluation consultations	6	Renewed proposal	46.1	2212.8

Source	Person-days	Type of proposal	Labour cost (hourly rate in EUR)	Cost (in EUR)
Interim evaluation consultations	5	Renewed proposal	39.9	1596
Interim evaluation consultations	2	Renewed proposal	20.7	331.2

Note: The analysis distinguishes between the renewal / updating of a proposal for an existing action (with an estimated average time spent of up to 6 days) and the preparation of a new proposal for a new action, for which the time spent increases significantly, from 10 person-days to 30 person-days.

Source: Authors' elaboration on the feedback received from action owners and stakeholders involved in the governance of the programme during the targeted consultations conducted for the interim and final evaluations of the programme. The data on hourly labour cost were retrieved from Eurostat: Eurostat, Labour cost levels by NACE Rev. 2 activity (based on the available data for 2019), available at: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lc_lci_lev&lang=en

Annex G.13 Overview of the main data sources feeding into the assessment of the evaluation criteria

Based on the information provided through the rest of the annexes, this annex provides a concise overview of the main data sources used to inform the assessment under each evaluation criterion.

Table 29 Data sources used to substantiate the findings per evaluation criterion

Criterion	Main data sources
Relevance	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • Public consultation • Expert assessment • Relevant literature in the field of interoperability
Effectiveness	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • Public consultation • Expert assessment • Information and data concerning the ISA² actions and solutions from the ISA² website and Joinup • Rolling work programme
Efficiency	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • ISA² Dashboard • Information and data concerning the ISA² actions and solutions from the ISA² website and Joinup • Rolling work programme
Coherence	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • Public consultation • Expert assessment • ISA² Dashboard • Information and data concerning the ISA² actions and solutions from the ISA² website and Joinup • Rolling work programme • Official documents
EU added value	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • Public consultation • Expert assessment • Information and data concerning the ISA² actions and solutions from the ISA² website and Joinup • Rolling work programme • Official documents
Utility	<ul style="list-style-type: none"> • In-depth interviews • Targeted online survey • Expert assessment • Perceived quality and utility surveys for three ISA² actions (conducted as part of the continual monitoring of the programme)

Criterion	Main data sources
Sustainability	<ul style="list-style-type: none"> • Targeted online survey • In-depth interviews • Expert assessment • Information and data concerning the ISA² actions and solutions from the ISA² website and Joinup

Source: Authors' elaboration.

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