ACROSS

Breaking Barriers:
Enhancing Cross-border Digital Public Services in the EU

JASMIN JABBARPOUR
Project Manager at The Lisbon Council

FRANCESCO MUREDDU
Senior Director at The Lisbon Council

LUCA ALESSANDRO REMOTTI
Senior Project Director at DataPower

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About

This Policy brief builds on research conducted by ACROSS, a 11-partner research consortium co-funded by the European Union:

To learn more, visit ACROSS website: **https://across-h2020.eu/**

The consortium includes the Athens Technology Center (ATC), Tecnalia, Dataport, Engineering, Grnet, The Lisbon Council, Timelex, WAAG, Fraunhofer, the Ministry of Environmental Protection and Regional Development of Latvia (VARAM), and GFOSS.

ACROSS main objective is to provide a holistic solution that allows public administrations to deliver a user-centric interoperable cross-border mobility service compliant with the current European regulations (e.g. the Single Digital Gateway, European Interoperability Framework) where the private sector can also interconnect their services while ensuring data sovereignty of the citizens.

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Executive Summary

The increasing integration among European Union member states is based on the mobility of goods, services and particularly of citizens, across states. Cross-border digital services are a fundamental enabler of citizen's freedom and even if eGovernment service availability increases in Europe, the supply of cross-border services is lagging and accessing eGovernment services from other EU countries remains a challenge for citizens.

The European Union has been placing a major effort to promote eGovernment and cross-border digital services, supporting the development of cross-border eGovernment services through various programmes and actions aimed at promoting interoperability, collaboration, and standardization among member states. The IDA programme, alongside the large-scale pilots, stands as a cornerstone in fostering the development of cross-border eGovernment services. Through the implementation of large-scale pilots, the EU aims to demonstrate the feasibility and effectiveness of cross-border eGovernment services in real-world scenarios. By standardizing protocols and establishing trust frameworks, STORK and PEPPOL enhance the efficiency and accessibility of cross-border eGovernment services, fostering a more cohesive and interconnected European digital ecosystem. The eIDAS Regulation is a cornerstone of the EU's digital agenda, provides a legal framework for electronic identification and trust services across member states. Another key initiative is the European Interoperability Framework (EIF), which provides guidelines and best practices for ensuring that eGovernment services are compatible and accessible across national borders. Furthermore, funding programs such as the Connecting Europe Facility (CEF) provide financial support for projects that aim to improve the interoperability and accessibility of eGovernment services at a cross-border level.

However, accessing eGovernment services from other EU countries remains a challenge for citizens: only a fraction of the eGovernment services are available at Member State level. There are still barriers to integration, related to procedural differences, lack of interoperability and standardisation, heterogeneity of regulations, lack of take-up of EU-level activities, such as the eIDAS regulation for personal identification.

The ACROSS project, funded by the Horizon 2020 programme, has effectively developed models and tools, and an open platform, to demonstrate the design and the development of user-centric, interoperable and privacy and data security embedded in their set-up. The objective of the ACROSS concept and implementation is to act as an enabler of a renewed commitment to delivery and standard enforcement and address the unsolved trade-offs between privacy, interoperability and user-centricity.

The goal of this document is to inform decision-makers, implementers, and stakeholders of ACROSS's innovative approach to co-create, specify, design and implement cross-border digital public services and to present the methods, tools and platform, which enable universal eGovernment services. This paper is capable of guiding policy-makers and practitioners through the solutions, tools, and methods developed by ACROSS.

In Chapter 1, the policy brief reports on the framework conditions of cross-border services, their developments in recent years and the enablers and obstacles. Chapter 2 outlines the details of the ACROSS results; Chapter 3 describes the effectiveness of the ACROSS solution and platform measured through the impact assessment. Chapter 4 provides the conclusions, lessons learned and policy recommendations.

1

The EU national eGovernment and cross-border public services

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1. The EU national eGovernment and cross-border public services

1.1 Context

The European single market is one of the core pursuits of the European Union. It was established in 1993 and has the purpose to guarantee the free mobility of goods, services, people, and capital throughout the territory of the EU. This strategy is particularly important for the development of the Union because it facilitates people's mobility for study or work, thus supporting the strategic goal of European integration.

On 1st January 2021, there were 13.9 million long-term movers in the EU[1], of which 10.2 million working age movers (20-64 years). Working movers amount to 3.9% of the overall working age population. Considering people's mobility for study purposes, 1.52 million students from abroad were engaged in tertiary level studies across the EU in 2021[2].

The availability of seamless digital eGovernment services is a key enabler of citizens' who wish to move to other member states for work, study and living reasons. Consequently, the European Union and national policy makers have since long put the development of eGovernment and of interoperable digital public services. Promoting eGovernment remains a top priority for the European Union[3]. In pursuit of the EU Digital Decade ambition, Europe aims to provide all key public services online by 2030. Investments and cornerstone policies are being put in place to make this happen and, consistently, Member States have allocated over 26% of the spending under the EU Recovery and Resilience Facility (RRF) to the digital transition[4]. Moreover, Europe has established the foundations for more human-centric digital initiatives, in line with European values, based on the Declaration on Digital Rights and Principles.

The 2020 Coronavirus (COVID-19) pandemic has put citizens, businesses, and governments to the test. It has prompted Europe to accelerate digitalisation and the patterns of how government services are delivered. The pandemic, imposing isolation, and remote interaction have been a potential booster for online eGovernment services[5].

Have governments been able to adapt and become more digitalised? The eGovernment Benchmark report[6] answers this question and compares how governments deliver digital public services. As an internationally recognised study, it looks at how government websites and portals for citizens and businesses continue to improve across Europe. This edition captures the digital transformation of governments in 2021 and 2020, during historical times of societal and economic resilience.

[1] 'Intra-EU Labour Mobility at a Glance 2022'.
[2] 'Eurostat Learning Mobility Statistics'.
[3] 'eGovernment Benchmark 2022. Synchronising Digital Governments. Capgemini, Sogeti, IDC and Politecnico Di Milano for the European Commission
[4] Directorate-General for Communications Networks, Content and Technology July – 2022. © European Union, 2022'.
[5] *Ibidem.*
[6] 'The Territorial Impact of Covid-19: Managing the Crisis Across Levels of Government © OECD 2020'.
[7] *Ibidem.*

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1.2 The development and integration of eGovernment services

The key factor to achieve the strategic goals is to enable citizens and businesses to benefit from convenient, secure, and interoperable authenticated access to public services across Europe. The eGovernment agenda is advancing through the modernisation of hundreds of public services and interoperability is a horizontal key enabler, including essential infrastructure services, common specifications, interoperability guidelines and re-usable software are all building blocks of high impact cross-border eGovernment.

In any case, there are always several specific challenges to the development of public online services, which include[7]:

- **Strategic and political sponsorship;**

- **Availability of funding;**

- **Legal and regulatory compliance and harmonisation;**

- **Interoperability of procedures and of legacy systems,** overcoming differences in in technology standards, data formats, processes, and organizational structures;

- **User-centric design,** trust and security, data protection and assurance by design, as well as addressing the digital divide issue, that is, considering citizens with limited access to online services and digital identity management systems;

- **Change Management implementing** the necessary organizational and cultural changes within government agencies.

By addressing these challenges, governments can effectively leverage digital technologies to provide efficient, accessible, and citizen-centric public services online.

1.3 The challenges of cross-border eGovernment services

Cross-border eGovernment is the provision of digital public services beyond national boundaries, enabling citizens and businesses of other states to interact and access services across different countries. On the other hand, national digital public services are specific to a particular country and cater to the needs of its citizens and businesses within its borders. Cross-border eGovernment pose different challenges in terms of scope, jurisdictional complexities, interoperability challenges, and cultural considerations. They require coordination and collaboration to offer benefits of citizens mobility and professional movement.

Cross-border eGovernment services support the remote interaction with other State's administrations and they are particularly important for the development of the European Union. They require:

· **the design of specific interfaces to serve stakeholders in other countries,** considering service specificities as well as linguistic access;	· **matching the jurisdictional elements,** enabling the cross-border eGovernment services to navigate the legal and regulatory frameworks of multiple countries, solving issues related to data protection, privacy, security, and interoperability;	· **addressing the issue of interoperability and of cross-border online** user identification and authentication;	· **dealing with greater complexity of coordination with multiple stakeholders**, including governments, international organizations, and service providers across different legal contexts.

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[7] Commission Staff Working Document: Final Evaluation of the European Interoperability Framework (EIF). SWD(2022) 720 Final'.

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To develop EU cross-border eGovernment services, it is necessary to achieve a robust level of interoperability that isn't solely reliant on technical solutions but requires agreements and established procedures among diverse organizations, synchronized data descriptions, legal frameworks permitting data exchanges, and sustained, structured cooperation over the long term. In this respect, the European Interoperability Framework (EIF)[8] outlines four distinct layers of interoperability that must be amalgamated into a comprehensive governance strategy: technical (pertaining to system compatibility); semantic (ensuring uniform comprehension of language and structured data); organizational (such as harmonized business processes); and legal (addressing rights and obligations).

The Interoperable Europe Act[9] stands as a fundamental pillar of the European Union's strategy aimed at significantly enhancing collaboration in interoperability among public administrations within the EU. This new policy promotes the exchange and repurposing of solutions and data among administrations, emphasizing the elimination of unnecessary administrative hurdles, including legal, organizational, semantic, and technical barriers. Such efforts aim to streamline processes, thereby cutting costs and saving time for citizens, businesses, and the public sector alike. Enhanced interoperability in the EU is based on a network of independent yet interconnected public administrations, working in tandem to drive innovation and mitigate fragmented policy execution in alignment with the EU's digital objectives for 2030.

In summary, European member states have progressed towards the digitisation of government services, in many cases overcoming the hurdles of fragmentation, legacy systems, non-harmonised data sets, lack of standardisation. This progress, however, happens at national level mostly.

The EU has put in place a whole set of policy instruments to facilitate the development of cross-border eGovernment services, but these developments are still strongly connected with the demand for such services as well as with the engagement of administrations in making them available and addressing the mentioned challenges. In the next sections, the analysis will focus on these aspects and how ACROSS has been able to develop good practices for the user-centric, secure, trusted, and effective development and provision of cross-border EU public services.

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[8] 'Brussels, 23.3.2017 COM(2017) 134 Final'.
[9] 'Brussels, 18.11.2022 COM(2022) 720 Final'.

1.4 Benchmarking the eGovernment development in the EU

In this paragraph we present and analyse the situation of eGovernment development in the European Union and compare it with the development of cross-border services. It shows the disparity between national online services and cross border services and the gaps that need to be filled.

For this purpose this brief has reviewed the DESI 2023 dashboard for the Digital Decade[10] and its data and indicators. The specific eGovernment Benchmark 2023 Background Report[11] Looking at the overall digital maturity, a synthetic index based on the four key dimensions of: User centricity, Transparency, Activation of Key Enablers, and Activation of cross-border services.

FIGURE 1
Overall maturity of participating countries.
Source: Digital Decade Report 2023

Score

100

65

30
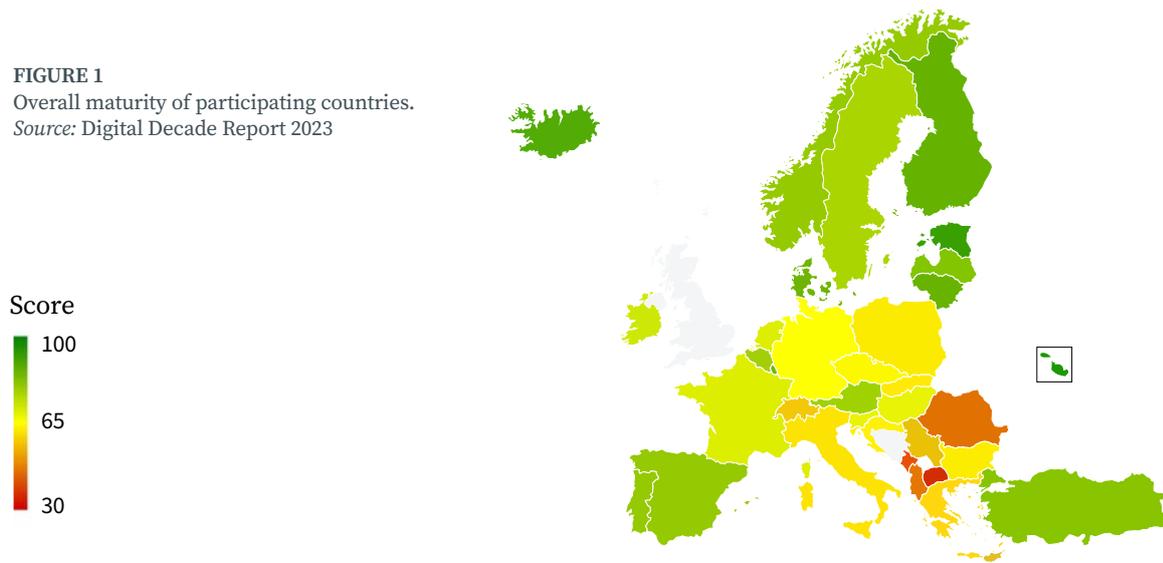
The Member States with the highest scores are Malta, Estonia, Luxembourg, Iceland, Finland, the Netherlands, Lithuania and Denmark. The most significant increases in the maturity score are recorded by Turkey, Poland, Greece, and Serbia.

FIGURE 2
Overall eGovernment maturity of EU Member States: biennal averages 2021/2020 and 2022/2021. *Source:* Digital Decade Report 2023

● Biennial Average 2020/2021
● Biennial average 2021/2022
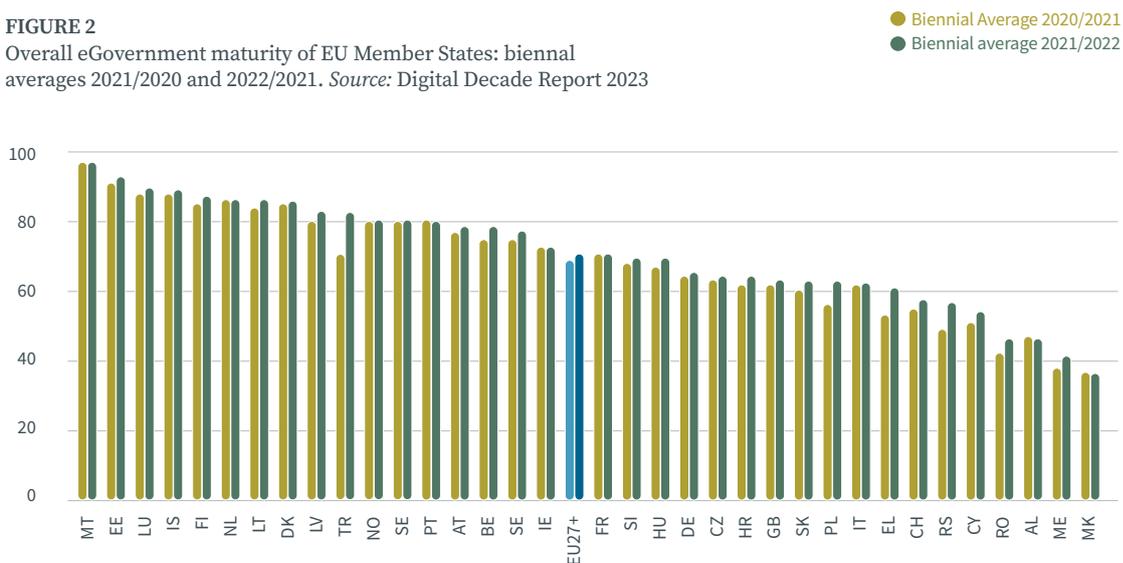
The Digital Decade Report 2023 also presents the scores of the key dimensions of different life events targeted at different user segments. Figure 3 presents the key eGovernment targets and themes and shows that User centricity is doing well in all segments confronted with other dimensions. Businesses are provided substantially more mature digital services than citizens. User centricity provides an indicator of the extent to which governments design their online services around user needs and the Digital Decade Report 2023 confirms that European Governments understand the importance of user needs when they design their services.

The user centricity dimension is still a leader, standing at an EU27+ average of 90 points, and can be used as the impetus to improve all other key dimensions. With an average of 71 points, the Key Enablers dimension shows promising performance growth, with countries enabling safe authentication through eID and pre-filling personal information from base registries for more and more services. Cross-border services are ready for the next step: creating online services for foreign users can quickly accelerate with more than 30 countries connected to eIDAS and the ongoing improvements on the Your Europe portal. The Transparency of eGovernment (currently at 62 points) can be improved upon by consistent service processes that are clear for the user.

FIGURE 3
Key dimensions scores per life event 2021/2021 and
general biennial average 2022/2021. *Source:* Digital Decade Report 2023

- 1. User centricity
- 2. Transparency
- 3. Key Enablers
- 4. Cross-border services

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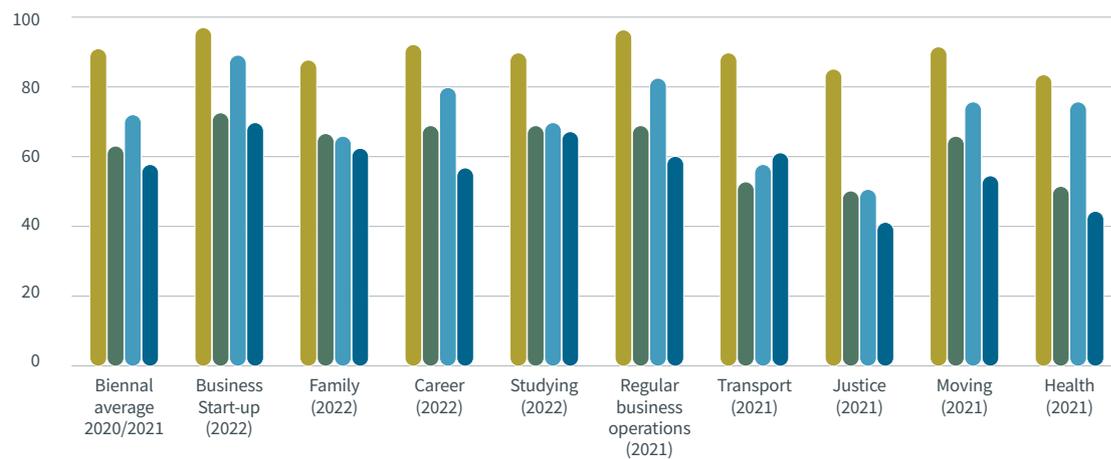
Transparency of eGovernment services, i.e. the provision of supplementary information to clarify how data is used, transmitted and processed by administrations, still has room for improvement, as far as service delivery and service design is concerned. Transparency of personal data scores high, probably due to the centricity of the GDPR (Figure 4).

FIGURE 4
Transparency indicators per life event.
Source: Digital Decade Report 2023.

- 2.1 Transparency of service delivery
- 2.2 Transparency of personal data
- 2.3 Transparency of service design
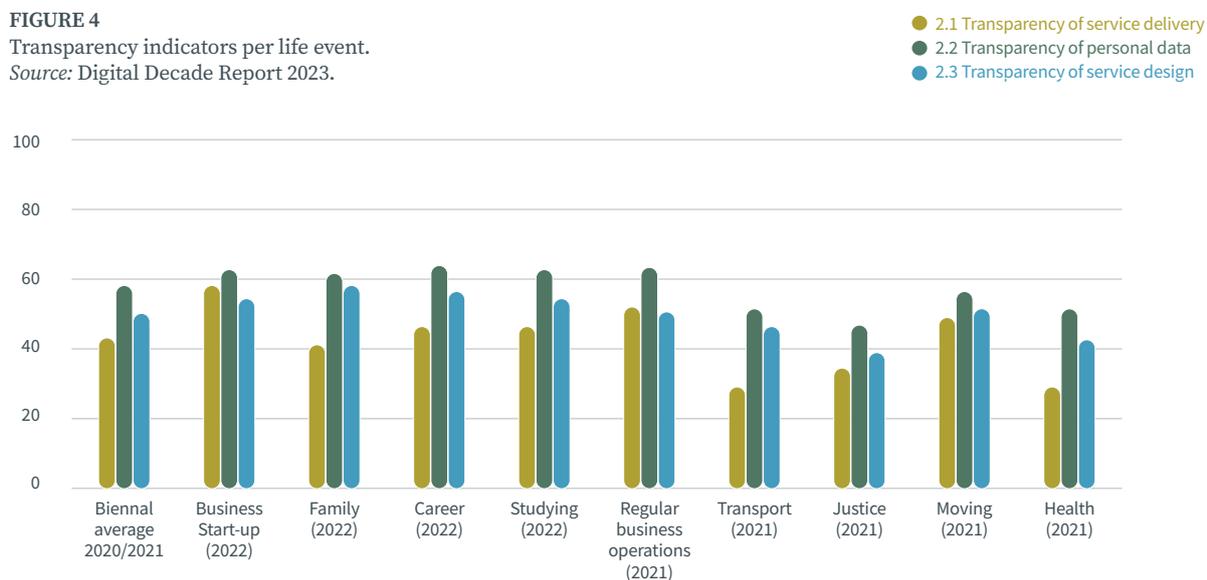
Concerning the key enablers, the Digital Decade Report 2023 distinguishes between the evaluation of businesses and that of citizens (Figure 5). The business average for enablers is higher than the one for citizens. This means that service websites and portals aimed at businesses implement these key enablers more frequently than service portals for citizens.

FIGURE 5
Enablers, business life events and citizen life events.
Source: Digital Decade Report 2023

- 3.1 eID
- 3.2 eDocuments
- 3.3 Authentic sources
- 3.4 Digital Post
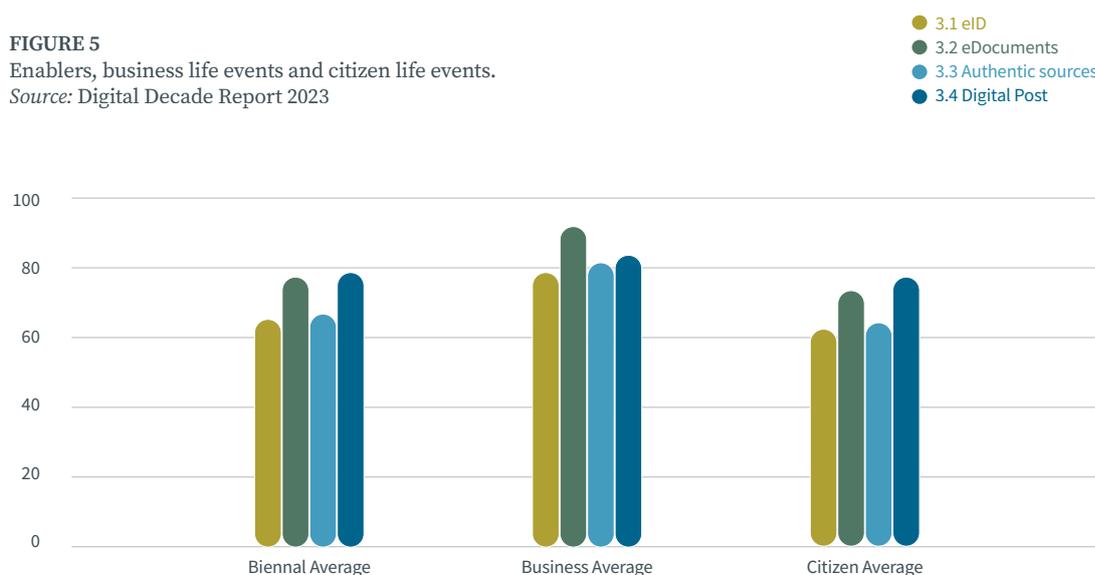
1.5 The usage of eGovernment services

According to the DESI Digital Decade Report 2023[12] and considering the eGovernment Benchmark, many government services are available online: the EU average is nearly 80% of the life events considered (Figure 5 and Figure 6). Still, on average across the European Union, one out of five citizens that regularly use the internet does not interact with the government online at all (Figure 7). This brings up several issues related to the design of online services with their audience in mind and the seamless characteristics of the user journey for citizens and entrepreneurs looking for an online service.

FIGURE 6
Digital Public Services for Citizens, all life events.
Source: DESI 2023
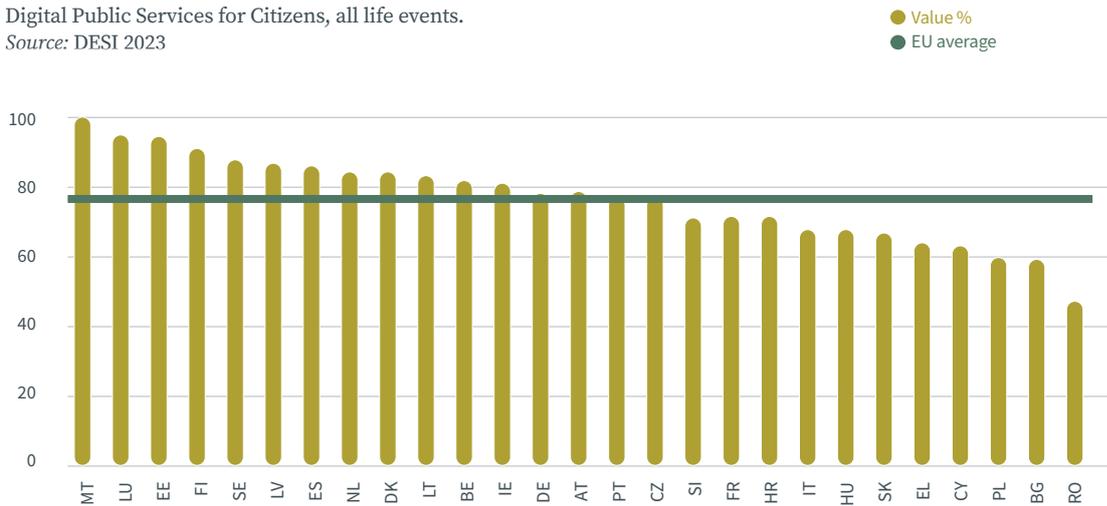
Challenges for citizens looking for cross-border eGovernment services are
  a) finding the right government website as the first step in the user journey;
  b) the use of one-stop-shops through government portal websites;
  c) performant government websites to facilitate the user experience.

FIGURE 7
EU eGovernment Users.
Source: DESI 2023

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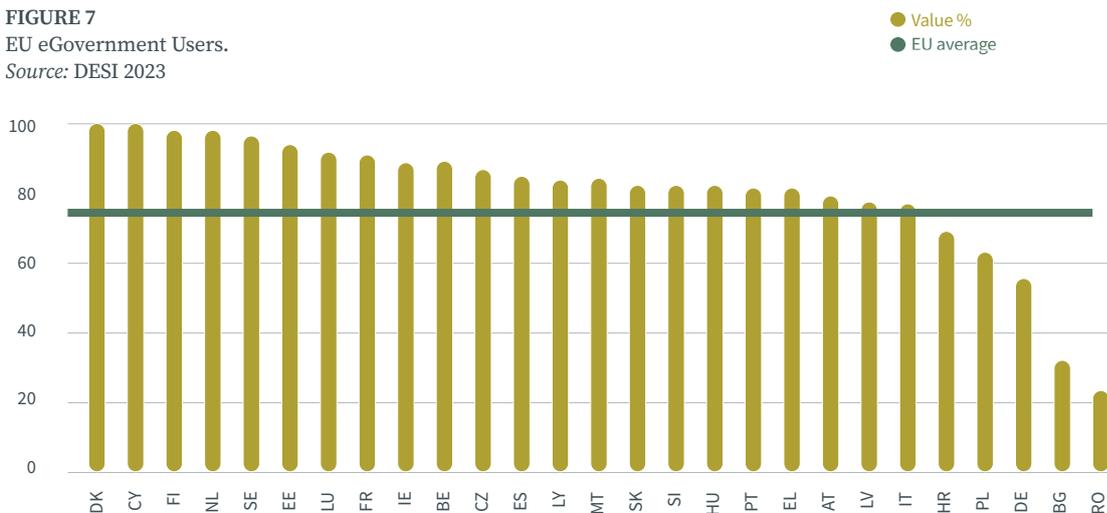
[12] eGovernment Benchmark 2023 - Background Report'.

1.6 Cross-border online eGovernment services

ACROSS is focusing on cross-border eGovernment services and the Digital Decade Report 2023 clearly confirms that available cross-border services lag significantly behind the online services available at national level, due to the driving factors mentioned in the context section of this policy brief.

Figure 8 presents the DESI 2023 data, and it is evident that there is a very significant gap between national availability and cross-border availability. The smallest gaps are recorded in Malta, Luxembourg and Estonia and the chart shows EU member states with significant national eGovernment development lagging behind in the cross-border availability. Major factors for the delayed development of cross-border services are most likely:

- **Demand, which still seems to be low and connected to the needs of less than 4% of the EU population mobility** for professional reasons in 2021;

- **Limited cross-border Digital Identity Management,** despite the significant advances of EIDAS[13] at EU level. As pointed out in the ACROSS Gap Analysis[14] there is "limited use of the EIDAS infrastructure and no mature digital wallet in the market today";

- **Limited cross-agency collaboration and strategic and political alignment and sponsorship;**

- **Limited interoperability between different government systems and databases and Open Data Initiatives;**

- **Demanding user-centric design and single point of access availability,** including the process integration and the development of language interfaces;

- **Privacy protection and data security by design of cross-border services,** with user trust and confidence in mind, which does not foster the use of such services by citizens.

FIGURE 8
Percentage of Government services which can be completed online by cross-border users compared to national eGovernment services. *Source:* DESI 2023.
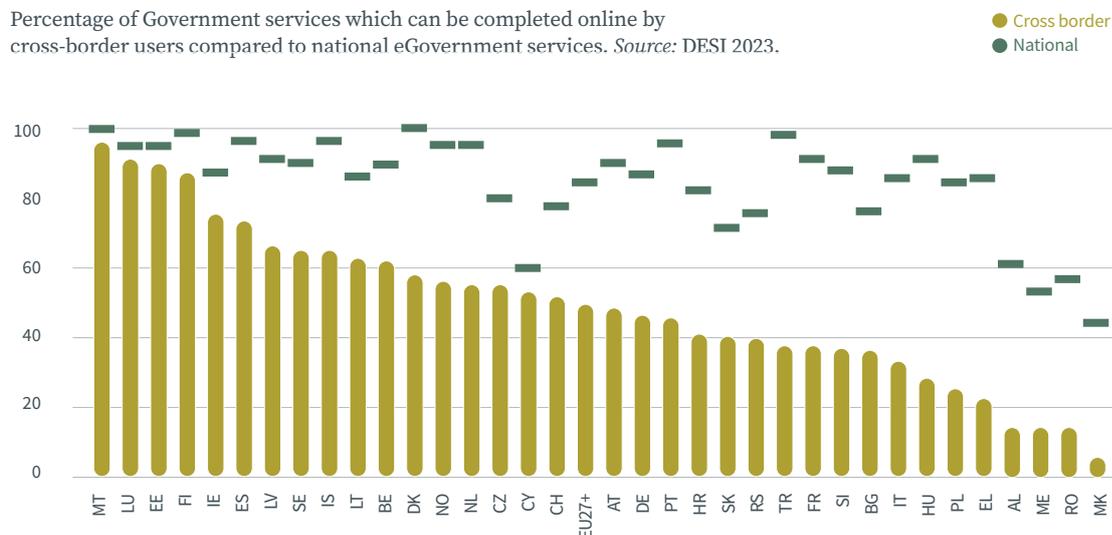
Figure 7 above, provided by the Digital Decade Report 2023, shows how on average in the European Union only less than half (49%) of cross-border eGovernment services can be completed online, against an average of around 83% of national public online services. There is a cluster of four countries, namely Malta, Luxembourg, Estonia, and Finland, with a relatively limited gap between the national and the cross-border dimensions. At a lower level, this is observed for Ireland and Cyprus, all other EU Member states show significant gaps.

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[13] The eIDAS regulation supports compatibility among the 27 EU Member States, guaranteeing the mutual acknowledgment of each other's designated electronic identification systems. It also verifies that trust services offered by compliant service providers under the Regulation are admissible as evidence in legal matters. Regulation (EU) No 910/2014.
[14] 'ACROSS D6.4 - Toolbox for Public Administration Managers and Policy Makers - Initial'.

1.6.1 Cross-border eID

The availability of cross-border authentication based on eID exceeds the availability at national level only in Luxembourg and in North Macedonia and the general EU27+ average is lower than 30% of the available national online services. The gaps according to the Digital Decade Report are still significant (Figure 9).

1.6.2 Other enablers

Cross-border users support is essential to help online users and even more so when these services are accessed from abroad. On average, only 57% of the services measured by the Digital Decade Report 2023 allowed cross-border users to share complaints on the digital services, compared to 85% availability on average to national eGovernment users.

In European eGovernment services 79% on average have implemented functions to submit or download official documents (eDocuments) at national level. At the cross-border level, this function is on average available only in 52% of the cases.

FIGURE 9
Percentage of services where authentication with eID is available to national and cross-border users.
Source: DESI 2023

● Cross border
● National

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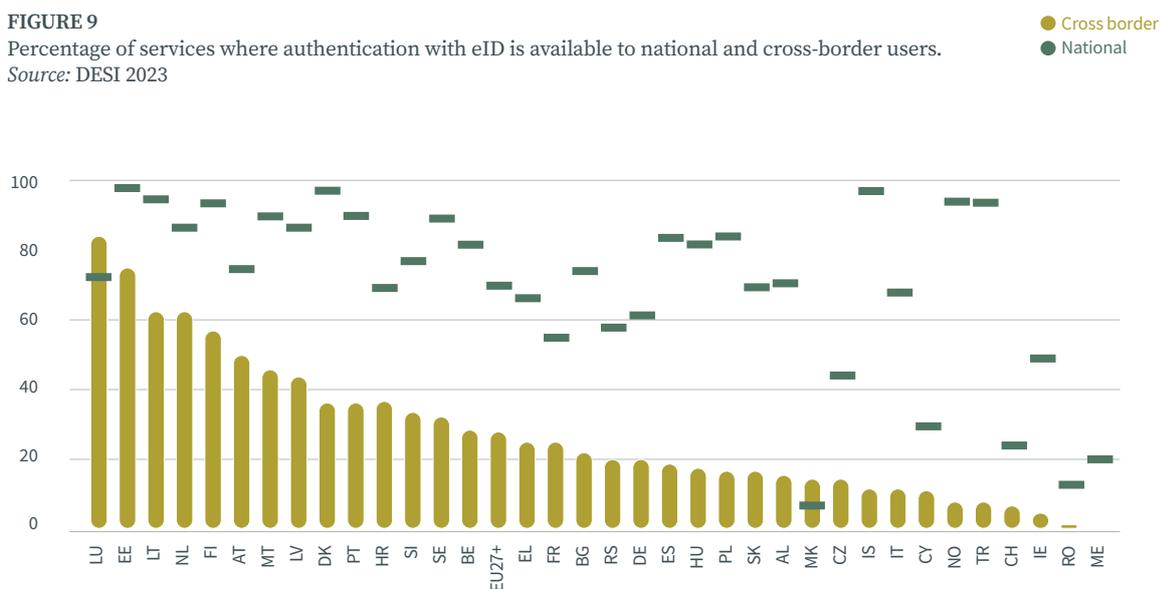
1.7 Conclusions

Cross-border eGovernment services are a key fostering factor for the guarantee of citizens' and workers' mobility. They facilitate EU citizen's access to the public online services of other Member States as needed.

Being able to access public services across borders is a key enabler for citizens wishing to move for work, study and living reasons. Policy makers have since long put the development of eGovernment and of interoperable digital public services. In any case, there are always several specific challenges to the development of public online services.

To develop EU cross-border eGovernment services it is necessary to achieve a robust level of interoperability that isn't solely reliant on technical solutions but requires agreements and established procedures among diverse organizations, synchronized data descriptions, legal frameworks permitting data exchanges, and sustained, structured cooperation over the long term.

The current status of eGovernment development, as measured by the EU Digital Decade Report, shows the distance between the development of eGovernment services and the level of the relevant pillars at Member State level, and the cross-border services. The former are far more developed than the latter, due to the hampering factors related to the cross-border dimension: low demand, limited political strategies and sponsorship, limited resources, lack of interoperability of Member State service systems.

The EU has put in place a whole set of policy instruments to facilitate the development of cross-border eGovernment services, but these developments are still strongly connected with the demand of such services as well as with the engagement of administrations in making them available addressing the mentioned challenges.

European Member states have progressed towards the digitisation of eGovernment services, in many cases overcoming the hurdles of fragmentation, legacy systems, non-harmonised data sets, and lack of standardisation. This progress, however, happens at national level mostly. A lot of progress stands ahead to take advantage of the EU-level policy instruments to drive the realisation of cross-border digital services.

2

The contribution of ACROSS to the next generation of cross-border public services

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2. The contribution of ACROSS to the next generation
of cross-border public services

2. The contribution of ACROSS to the next generation of cross-border public services[15]

In the context of a developing EU-level eGovernment services scenario it is important to implement systems which help citizens to interact with administrations of other Member states. The overall assessment of the availability of online eGovernment services[16] shows that there is still a major path ahead to make online services available to citizens who want to move to another country to study or work. This emerged from the gap analysis and the overall review of the situation of cross-border online services and their enablers, such as cross-border eID, cross-border support and eDocument delivery.

2.1 The ACROSS cross-border online service model

The ACROSS project addressed the problem of providing cross-border eGovernment services in the fragmented, heterogeneous, and uneven landscape of online public services defining and implementing a practice model, which defines a set of principles and guidelines for public administrations in the provision of cross-border services in a practical way.

ACROSS addresses the issue that citizens encounter when interacting with the websites of the public service institutions, which is the difficulty in finding the correct digital public service and the sequence of the steps that need to be taken. The ACROSS solution and platform is based on three fully developed use cases implemented in Latvia, Greece and Germany and complemented by the web app that targets any stakeholder aiming to move abroad for studying or working.
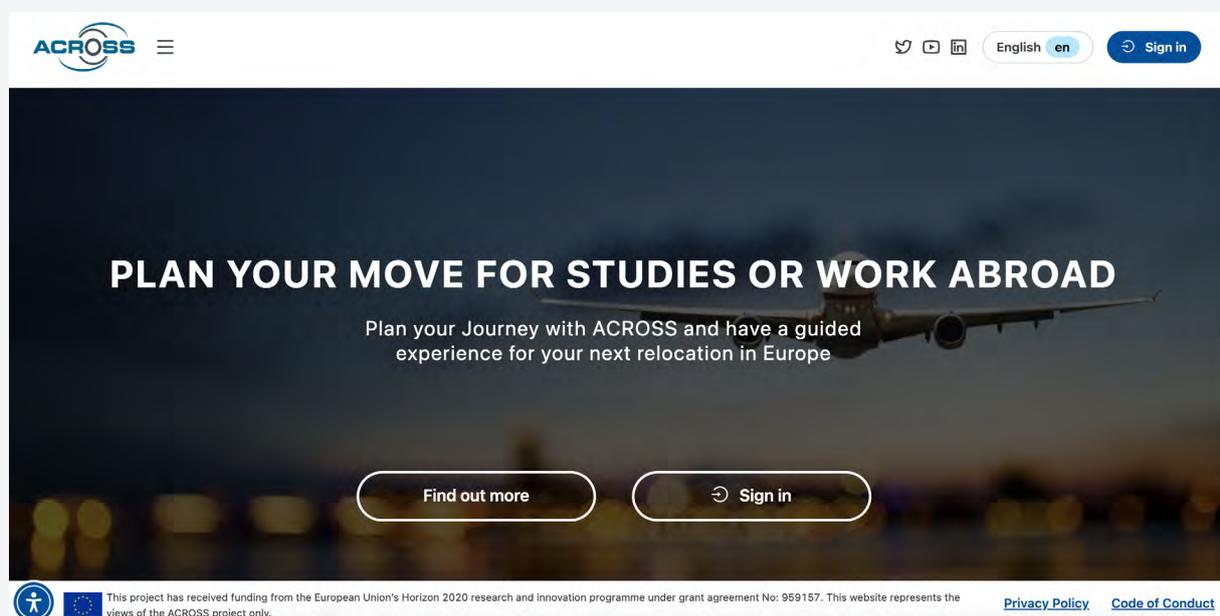

FIGURE 10
ACROSS Citizen Front-end

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[15] 'ACROSS D7.7 – ACROSS IPR Management, Business Models, and Business Plan'.
[16] 'eGovernment Benchmark 2023 - Background Report'.

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The design and implementation of the toolbox is based on the gap analysis in the three use case countries as well as on the assessment of the current scenario, which is an effective way to overcome the factors that hamper the development of cross-border eGovernment services. It fulfils the goal to provide a model of seamless cross-border services for citizens and businesses.

ACROSS provides a powerful platform and toolbox to support public service managers and policymakers in the conception, design, and implementation of cross-border eGovernment services. It provides them with a practical approach to deliver cross-border services and evaluate their effectiveness, helping to remove these barriers. The consortium has investigated the current experiences and services utilized by EU citizens who move abroad for work or study. It has put in place a co-creative process understanding the journey of citizens moving across Europe for work or study, defining "user scenarios" representing the experiences of the project's end-users. ACROSS places the development of good practices for public administrations at the centre of its action; this is achieved through delivering user-centric interoperable cross-border mobility services compliant with the current European regulations, which also enable an innovative approach to design and service integration.

The ACROSS Platform provides access to digital services and data from different organizations, to facilitate citizens' abroad mobility. It provides a web application, accessible also by mobile phone, for one-stop-shop service delivery to facilitate procedures and reduce barriers. It proposes a user-friendly cross-border service with implemented once-only-principle and through which the users can always control how their personal data is used by public administrations, businesses and data brokers through a data governance framework being able to easily manage and handle sensitive information.

The main innovation is the access to one-stop-shop that allows the users to carry out multiple transactions in several countries, without having to enter the multiple websites of the public services institutions. The ACROSS solution provides social and technical enablers to co-design, co-create and co-deliver user-centric, accessible, interoperable and regulation-compliant cross border digital services tailored to user needs and expectations and based on user-centricity, inclusion and accessibility, security and privacy, multilingualism.

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2.2 The customers and stakeholders of the ACROSS solution

The ACROSS Model and Platform target Public Administrations and ICT providers of public administrations, in particular in the three use case countries Latvia, Greece and Germany. The interoperable services provided are delivered to residents and non-residents and, due to its user-centric design, it minimizes administrative, organizational, technological, and legal obstacles, building on interoperable services. In particular, the stakeholders of the ACROSS platform include:

• EU-residents, whose personal data is exchanged or who are in some way identified online;

• People who want to move from one EU country to another EU country for study or work purposes, regardless of whether they are EU-citizens;

• Public bodies providing services (universities) and private service providers;

• Local, regional, and national government agencies, governmental immigration agencies;

• Universities with international students and companies with international employees;

• Cross-border service providers and developers;

• EU and national policy makers who set the agenda for European digitisation and who work in areas related to digitisation

The end users of ACROSS results are the citizens who, either for study or for work, are moving to another EU country . The applications include all types of administrative obligations, such as :

• **University application;**

• **Recognition of academic diploma and professional qualifications;**

• **Housing services;**

• **Public transportation;**

• **Private Health insurance;**

• **Bank account;**

• **Tax and social insurance numbers;**

• **Registration of address or residency;**

• **Registration at a general practitioner;**

• **Registration for social benefits;**

• **Tax identification number, tax declaration and associated duties;**

• **Officially required registrations for work.**

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[17] 'ACROSS D7.7 – ACROSS IPR Management, Business Models, and Business Plan'.

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2.3 The guiding principles of the ACROSS approach

The ACROSS solution and platform is built to provide significant advantages to cross-border service beneficiaries, providers and stakeholders, government organisations and citizens. These benefits concern:

- **simplified administrative processes reducing the administrative burden for end-users**, clarity of access and processes, avoiding duplicate tasks, providing single access points and respecting the once-only-principle, implementing one authentication across all platforms;

- **process efficiency by optimizing the government offices organizational processes**, minimisation of the number of transactions, saving time and improving data/information quality;

- **digitalisation of cross-border processes and reduction of paper-based business;**

- **enhanced transparency and accountability** to improve trust of all parties;

- **compliance with the Data Governance Framework** and relevant policies and regulatory compliance;

- **overcoming the language barrier.**

2.3.1 The gap analysis[18,19]

The gap analysis points out the missing elements for cross-border and user-centric digital public services that put European citizens and their sovereignty at the core. The gap analysis was based on a regulatory and policy analysis considering the Single Digital Gateway act, the Your Europe Portal, the European Student Card Initiative, and eIDAS; desk research of available online services in the countries of the use cases; and the expertise and input from pilot partners. The gap analysis was conducted together with the user journey methodology, allowing a holistic view of what are the gaps in the currently provided services and how citizens would like these services to be provided.

It produced an overview of requirements for interoperable, cross-border and user-centric public services. All the gaps were combined and compiled into a single, complete overview.

The gaps addressed by ACROSS and its solution:

- **a mutual trust and recognition base**, enabled by the ACROSS ecosystem of stakeholders and the connecting platform;

- **information sharing between EU member states**, supported by the ACROSS platform for the design and implementation of stakeholder interaction strategies and cooperation mechanisms;

- **real and perceived risk of function creep in connection with the highly personal or sensitive personal credentials**, addressed by the trust-by-design approach and the data owner control over their personal data delivered to the system, also towards public authorities;

- **the uneven development of eGovernment services across the EU**, addressed by the solutions provided by the ACROSS service catalogue and adapters and the good practices to implement EU-wide solutions;

- **lack of trust between institutions managing online service and eGovernment processes**, gap addressed by the ACROSS data governance framework and through the application of the OOP – Once Only Principle;

- **the citizen's requirement for mobile access**, through the ACROSS web app;

- **the digital divide of certain groups of EU citizens**, addressed by the system and application design based on the User Journey;

- **partial knowledge of procedures and processes abroad, also addressed by the system and application design based on the User Journey**;

- **online service language barriers**, solved by the implementation of the ACROSS virtual assistant.

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[18] 'ACROSS D2.3 Cross-Border Services Gap Analysis – Initial'.
[19] 'ACROSS D2.4 Cross-Border Services Gap Analysis – Final'.

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2.3.2 The functional implementation of the ACROSS solution and platform[20]

The ACROSS platform is structured into two layers: the architecture and functions of the platform and the end-user interface, with the external appearance, look-and-feel and the overall high-level functionalities are presented.

Most important services – work scenario	Most important services – study scenario	Other services	End-to-end user journeys in the ACROSS project
• Housing services • European Health Insurance • Registration with local authorities	• University information services about studying abroad • Erasmus programme applications • Applications for enrolment in university • Housing services	• Search for university • Apply for university • Recognize previous education (for study & work) • Apply for funding • Tax declaration	1. Latvian going to Greece for studying 2. Latvian going to Germany for working 3. Greek going to Germany for working 4. Greek going to Germany for studying 5. German going to Latvia for studying

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## 2.4 The elements of the ACROSS solution[21]
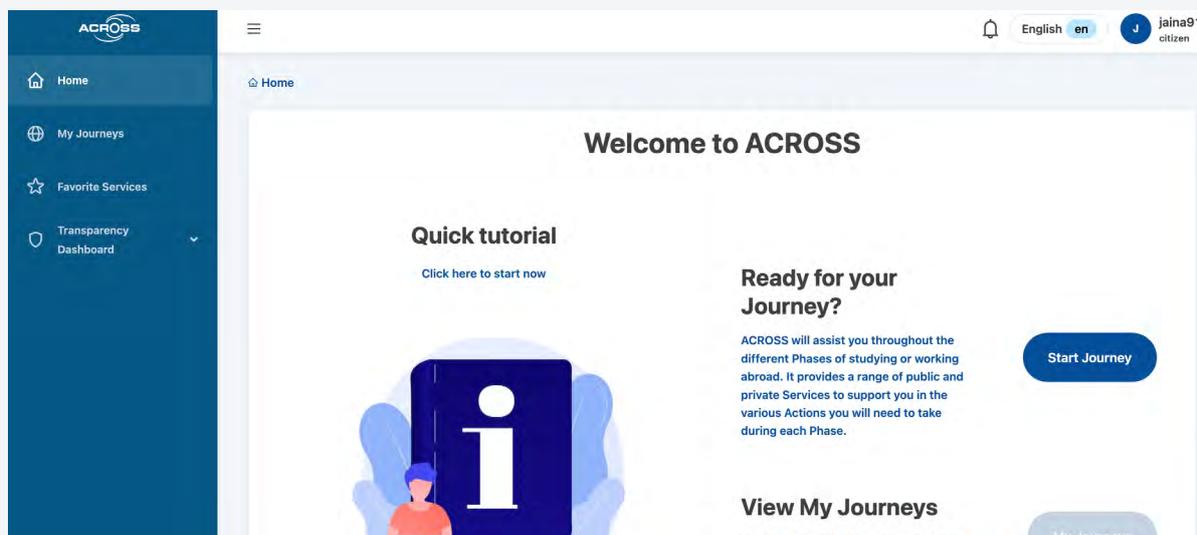
FIGURE 11
ACROSS Platform Home Page

As shown, cross-border services within the EU have become increasingly important as the EU continues to develop the integration of its society and markets. These online services have the potential to drive economic growth and improve the lives of citizens across the EU. Nevertheless, the complexity of regulations and administrative procedures can make it difficult for governments to provide cross-border services. To support the implementation and delivery of online services, the ACROSS project has developed several solutions to help simplify and streamline the eGovernment cross-border mobility services development. These solutions are based on the construction and review of user-centric journeys, which are validated and tested for effectiveness and efficiency.

Developing these solutions, the ACROSS consortium has also learned good practices for national governments when they develop and implement cross-border services and has concretely engaged in their transfer towards European administrations based on the ACROSS Toolbox[22].

These learned lessons are incorporated into the toolbox of the project. Therefore, it is necessary to have an overview of the solutions that the project is currently developing to then acknowledge the lessons learned and policy recommendations.

2.4.1 User Journey and User Journey Modelling Tool

Adopting the 'User Journey' approach for the definition of (digital) public services has demonstrated significant improvements in usability of the different systems and processes citizens or other stakeholders engage with to execute life events, in this case the event "moving to another EU Member States. The associated UJMT, the User Journey Modelling Tool, is not a service provider itself and therefore does not offer an API but a user interface to the modelling expert. The UJMT retrieves the selected services via the API of the Service Catalogue component and presents them to the modelling expert as graphic elements. Locations and thematic areas of the service are used in the tool for service categorisation and filtering.

The platform has demonstrated to be flexible and extensible, allowing for easy adaption of new capabilities and functionalities and presenting the users with the latest updates through a continuous delivery of new releases. The modelling tool allows the regular monitoring and evaluation of the user journey to ensure that it meets the needs of citizens and that the solutions developed address requirements effectively over time taking a data-driven, evidence-based approach.

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[21] 'ACROSS D5.2 System Architecture and Implementation Plan- Final'.
[22] 'ACROSS D6.5 Toolbox for Public Administration Managers and Policymakers - Final'. The online version of the ACROSS Toolbox is available at the following link: **https://joinup.ec.europa.eu/ collection/sipg/solution/across-toolbox**

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2.4.2 The Public Stack Reflection Cards

ACROSS developed a tool to guide users through the governance and service design approach implemented. The Public Stack Reflection Cards help the users to identify the foundational values that drive their development process and reflect on how these values are integrated into their design process and technology. The public stack approach promotes the alignment of technology with public values, an open and participatory design process, open-source and privacy-by-design technology, and a positive impact on society and the environment. The cards are in a team setting, facilitating discussion and reflection and they can be applied throughout the development process, even if ongoing.

2.4.3 Service Catalogue

The Service Catalogue is the core component of the Harmonization and Connectors layers of ACROSS Platform to provide a uniform description of the services and the related invocation. It provides all functionality to register, model, map, publish and manage all the information needed to support the uses of service (public & private). The Service Catalogue is a layered application implementing the Service Registry (front-end and backend) and Metadata Catalogue features, to provide APIs for programmatically interaction with other components of ACROSS platform and dashboards and a graphical editor supporting users to manage service descriptions and related model adaptation.

2.4.4 Connectors

ACROSS provides connectors to relate and access public/private services offered by both the Public Administration and third parties and to get data from heterogeneous sources such as repositories, existing systems. The ACROSS system supports the harmonization of data coming from connected data sources and third-party services enabling semantic interoperability and a standard and common model of service description. The data harmonization tools 'translate' the digital public services in the legacy format to the format recommended by the EIF[23], the interoperability at cross-border in the different dimensions (technical, semantic) is achieved, so these can be used both by the public servants, businesses, and the citizens.

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[23] European Commission, 'The New European Interoperability Framework'.

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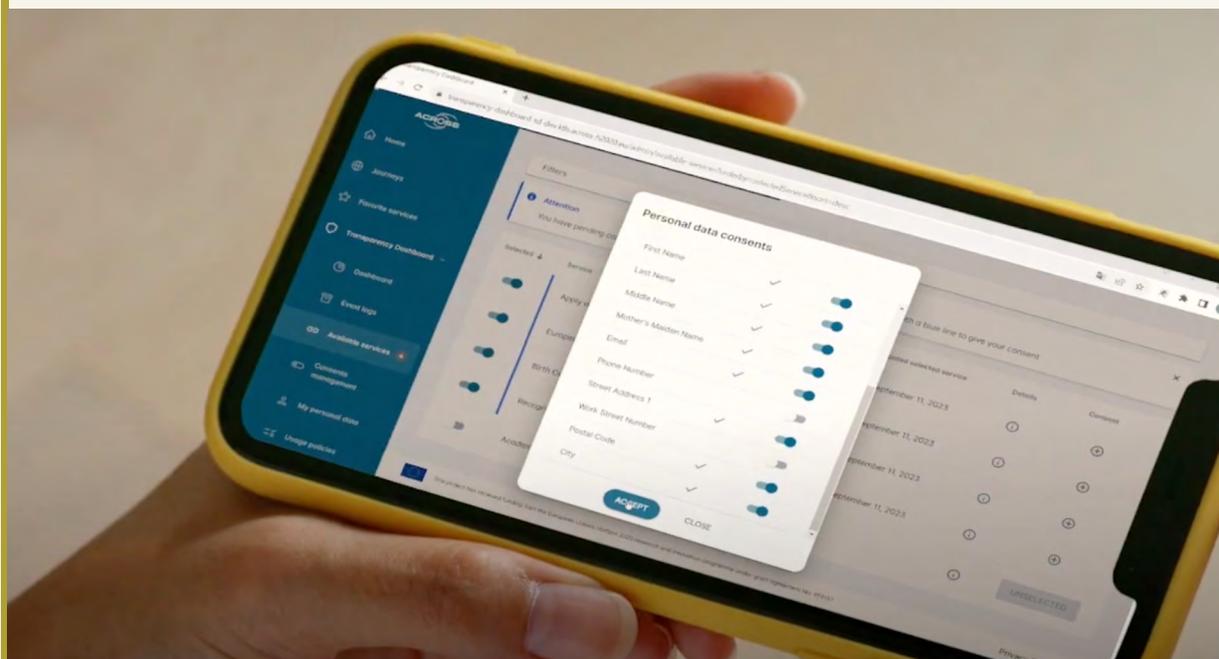
2.4.5 Virtual Assistant (VA)

ACROSS's solution to support users-citizen in taking advantage of cross-border online services interacting with a digital public service. The VA supports the users with speech communication and multiple languages, enhancing the interaction with the public service by improving accessibility and lowering potential language barriers. Most of the user interface elements can be controlled by the citizen through natural language text input of through spoken language, to:

- **Create a journey,** selecting origin and destination country and the purpose of the journey, i.e. work or travel.

- **Select the settings:** the user and display language and the user interface theme.

- **Select the execution of individual services** within the user journey workflow and providing additional information and data needed for the service.

The VA uses AI-enabled automatic speech recognition (ASR), Text-to-speech (TTS) synthesis and machine translation (MT) and can accept typed and spoken user expressions in different languages, both for application control and for data provision. Since the VA supports ACROSS Citizen Web/App but per se has no service provider role, no service APIs have been developed. It does control the ACROSS Citizen Web App directly through the standardized Javascript programming interface[24].

2.4.6 Platform and web application

ACROSS has concretely proved the advantages of using a one-stop-shop web application that allows the users to carry out multiple transactions in several countries, without having to enter the multiple websites of the public services institutions relevant to said service. The ACROSS Citizen WebApp provides an integrated chat widget which can be opened using a button. The chat widget is coupled with the VA, which is simultaneously activated. The conversation between the user and VA is then shown within this widget. When activated, this widget allows the user to inspect important internal aspects of the VA during its execution.

2.4.7 Data governance framework

The data governance framework incorporated in the project ensures that control is in the hands of the citizens on how their personal data is used, by whom and for what purpose. Using easy-to-understand metrics and visualizations, citizens can easily adapt each data type (e.g., documents, forms, and so on) to their specific privacy preferences, while better understanding the value of their data and the privacy/utility trade-off they are entering.

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[24] 'ACROSS D5.2 System Architecture and Implementation Plan- Final'.

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2.5 The ACROSS ecosystem and good eGovernment practices

ACROSS provides benefits to two main target groups: government organisations and citizens.

To Governments it provides good practices and tools to implement simplified administrative processes and reducing the administrative burden for end-users, facilitating their interaction with the platform, and avoiding duplicate tasks. It sets out the principles to achieve improved process efficiency by optimizing the government offices organizational processes, reducing time, limiting the need for transactions, and improving the overall data and information quality. It proposes practices to improve service delivery, process transparency and accountability leading to greater satisfaction and trust of citizens.

Citizens benefit from ACROSS which provides a model for a one-stop-shop of information regarding the life event of moving. The platform facilitates the understanding of the administrative procedures of other EU Member states and helps overcoming language barriers and provides a one-stop-shop with easily understandable procedures and instruction, fast downloadable results.

The ACROSS model builds on a paperless concept and it respects the Data Governance Framework, which empowers citizens to make better decisions on handling their data across all the different stakeholders. It uses a single authentication to the platform for the whole process

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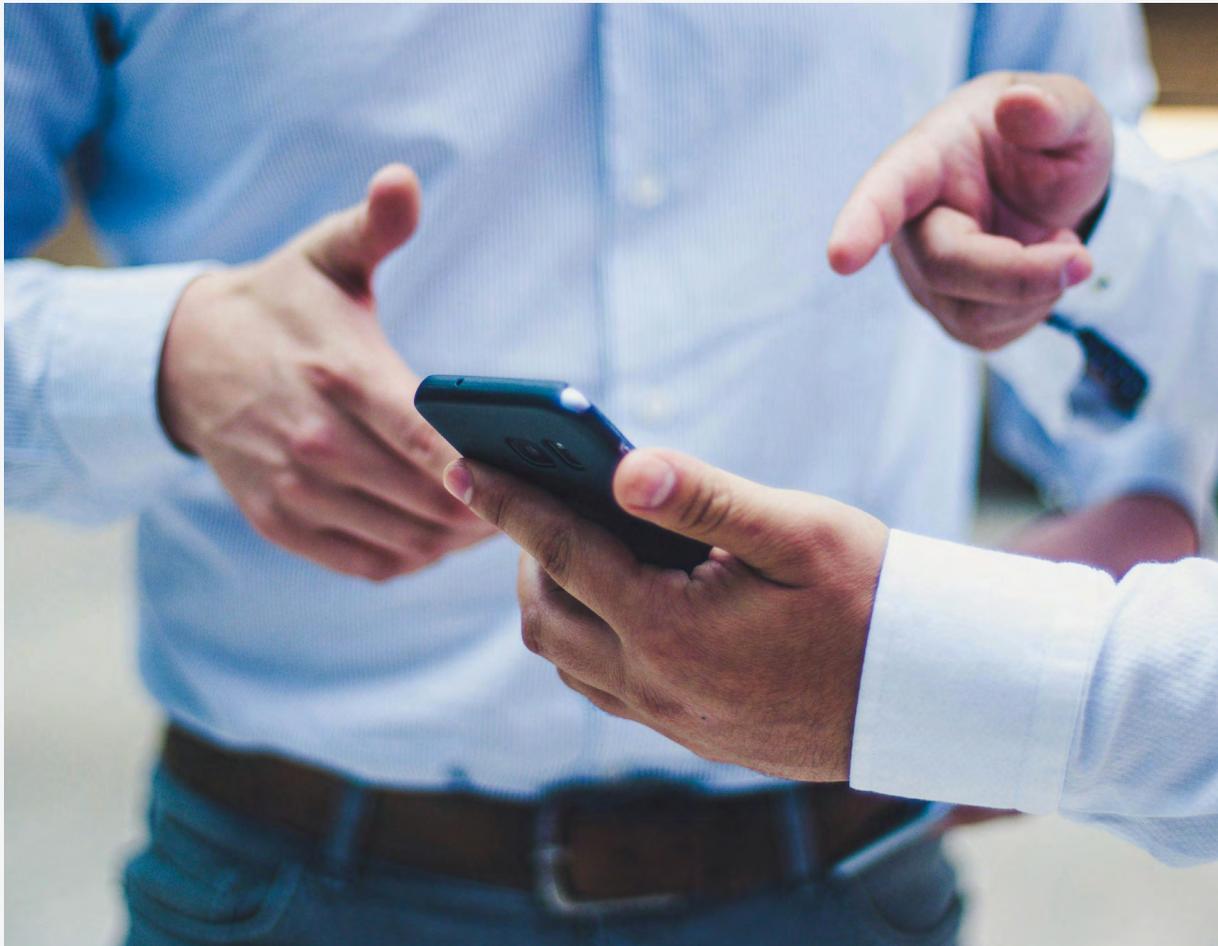
The assessment of the ACROSS experience and lessons for implementation

3. The assessment of the ACROSS experience and lessons for implementation

To evaluate the actual impact of the implementation of the concept, tools and platform, ACROSS has undertaken the impact assessment and the evaluation of the use cases in three pilot countries, namely Germany, Greece and Latvia. The assessment and evaluation determine the capability of the ACROSS solution to increase effectiveness and efficiency of cross-border services for EU citizens while preserving data sovereignty and increasing the trust in public administration.

The assessment is based on the impact assessment framework and methodology, using a set of 38 quantitative and qualitative indicators to measure the effectiveness, efficiency, relevance, replicability and scalability of the ACROSS intervention in the three pilots for citizens, public administrations and business undertaken in Latvia, Greece and Germany.

The set of indicators starts with the intervention logic, the background from previous work, and the experience in the eGovernment field from consortium members, using a co-creation approach. The indicators were used to design the survey conducted in the three pilots to collect qualitative and quantitative data for assessing the impacts of ACROSS Platform with regards the target users and beneficiaries, from citizens to administrations, to technical developers.

For each indicator a target value was established to assess the level of performance against an agreed benchmark.

The expected impacts have been grouped into evaluation categories, and per each category has been defined a set of questions relevant to the stakeholder target:

- **Effectiveness,** to measure the extent the cross-border process achieves its intended outcomes for target users and how well the desired results are met and targeted problems are solved or needs are addressed.

- **Efficiency,** to measure how economically resources are utilized to deliver cross-border services to achieve desired outcomes, focusing on the relationship between the input of resources and the output or results achieved.

- **Usability,** to determine how easily and intuitively users can navigate and interact with the platform for their purpose, in terms of simplicity, accessibility, and efficiency.

- **Accessibility,** to assess how easily individuals with diverse abilities and from various backgrounds can access and use the platform. Mostly determined through the compliance with the WCAG standards and the "usability by design" approach.

- **Trust**, measuring the confidence that citizens, students, and workers have in the platform's security, privacy, and reliability. It is based on the actual ability and effectiveness of communication to protect user data, ensure secure transactions, and maintain consistent performance without breaches or failures.

- **Adoption,** representing the platform's effectiveness in meeting user needs, its ease of use, and the value it provides in enabling smooth cross-border interactions. This rate is a crucial measure of the platform's capability to engage users and improve the ease and efficiency with which public services can be accessed across borders.

A mix of quantitative and qualitative data collection methods has been used as indicated in the Impact Assessment Framework: quantitative data has been collected through the stakeholder surveys, project logs and metrics from the platform, while focus groups, semi-structured interviews and project blogs have mostly generative qualitative data.

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3.1 The results of the impact assessment

3.1.1 The Greek Use Case

From the perspective of **Adoption** of the ACROSS platform and solutions, the Greek stakeholders show a great willingness to adopt the platform and to recommend its use. More in detail, Greek public organisations for their major part are willing to adopt and support the User Journey approach proposed in ACROSS. The majority of surveyed stakeholders confirm that the use of ACROSS Platform is capable of accelerating the adoption of new digital technologies as well as the digitalization of public administration processes.

The Greek stakeholders are in general quite satisfied with the **Effectiveness** of the ACROSS solution and confirm the positive impact of the ACROSS solution and platform of the new cross-border public service process. The ACROSS solution reduces time to complete cross-border procedures; it reduces the number of administration bodies with which the citizen has to interact; and overall, it simplifies the access to cross-border services; it facilitates the delivery of necessary information on the part of citizens and reduces the process costs; it simplifies the understanding and use of cross-border administrative processes. Overall, the ACROSS user experience demonstrates the government's commitment to improve the public services for citizens and help services are considered enablers for new business opportunities and fostering a larger user base.

In respect to the **Efficiency** of ACROSS in setting up the interactions between governments and citizens, the majority of stakeholders considers it high. Most respondents consider that the ACROSS solution facilitates the use of essential data to complete the cross-border processes and it is capable of enhancing communication between users and administrations also through the integration of different languages. Stakeholders in general do not believe that adopting the ACROSS solution and platforms will generate a significant impact on the operational expenses of administrations (OpEx). These are likely to be optimised when the ACROSS adoption will be conducive to enlarged business opportunities and the access to a larger user base.

The Greek stakeholders confirm the high **Usability** of the ACROSS solution and platform, in particular considering the virtual assistant's user friendliness; the overall quality of its user support in service navigation is rated high; the language support; and the ease of navigation. Also, the usability from mobile devices was considered very high. There are still areas of improvement of the solution, undertaking a wider industrialisation effort after the ACROSS project completion, which would further enhance navigation, reduce process completion time, and improve information clarity.

Overall, most stakeholders agree that the ACROSS platform is capable of enhancing citizens' control over their personal data during cross-border processes; to facilitate personal data management compared to current methods; and more secure providing their personal data through the ACROSS Platform than with existing practices. The ACROSS solution is capable of increasing trust in governmental operations and to foster improved collaboration and trust between governments, as well as among member states.

3.1.2 The German Use Case

As far as the **Adoption indicators** is concerned, responses to the survey show that government experts are willing to adopt the user journey method to define and design cross-border public services. Furthermore, stakeholders confirm a highly positive impact of the ACROSS platform on the process of digitalization of cross-border services by public administrations. The ACROSS platform could also highly facilitate the exploitation of digital innovation and contribute to accelerate the digital transformation process.

The final value scoring shows that a very high percentage of interviewed citizens and experts are willing to recommend the use of the ACROSS platform to a friend or colleague.

Considering the **Effectiveness indicators**, citizens, experts and stakeholders participating in the experiment are quite satisfied about the ACROSS Platform services. Individuals participating in the survey consider the effectiveness of the Platform in addressing their needs satisfactory, when requesting cross-border services to public organizations. The Platform helps reducing the time required to complete cross-border services; it significantly enhances the cost-effectiveness of completing cross-border processes compared to existing methods; the Platform facilitates the process to study or work abroad according to the impact assessment participants; finally, the assessment shows a high score of ACROSS Platform service effectiveness, on the one hand generating new business opportunities and on the other hand expanding the customer base.

In respect to the impact on **Efficiency**, participants in the German use case impact assessment concur that the Platform enhances the efficiency of cross-border service delivery to beneficiaries. However, only 50% of respondents believe that the ACROSS Platform reduces operational expenses for service providers, falling short of the expected 75% agreement threshold. Experts acknowledge that the ACROSS platform manages to streamline processes; minimize the number of interactions through automation; enable service providers to request only essential information according to the OOP. Generally, positive remarks are provided on the streamlining of data requests as well as on the clarity of government to citizens communication, also in connection with the local language support.

Considering the **Usability indicators**, the responses to the German impact assessment generally exceed the target scores, with the exception of the evaluation of the Virtual Assistant. Stakeholders emphasise the Platform's improved handling of personal data and enhanced collaboration among service-providing organizations, however they also point at areas for improvement as far as the personal data and privacy and identity management is concerned and as far as. The perceived safety when providing personal data to the platform meets the target threshold but can be improved.
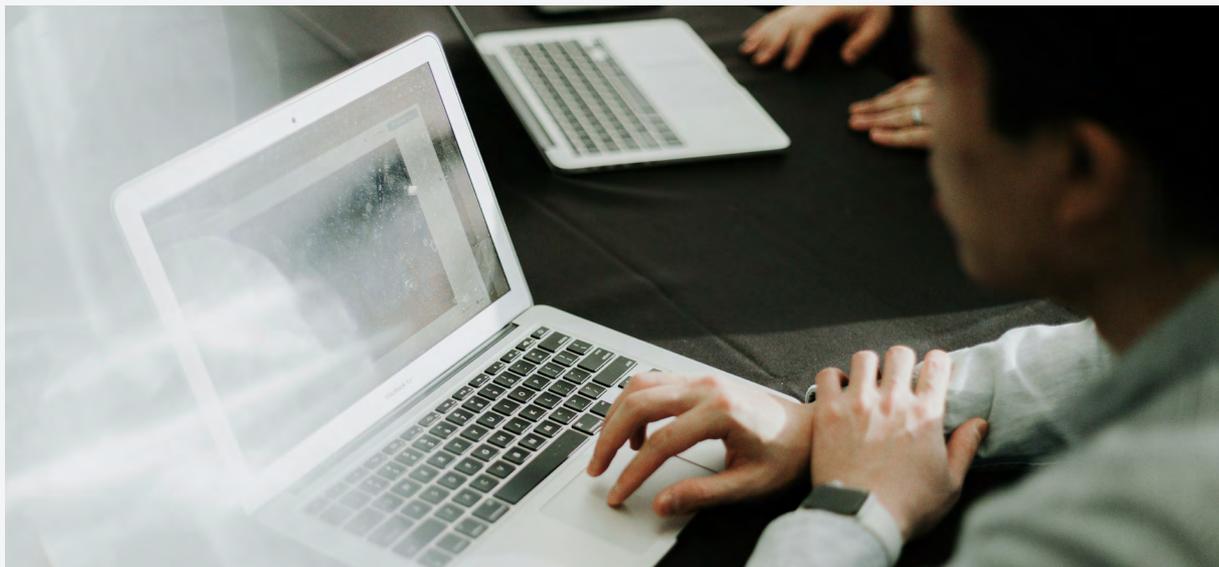
3.1.3 The Latvian Use Case

The results of the Latvian impact assessment show a lower **willingness of adopting** ACROSS Platform in respect to the German and Greek case. There is a moderate scepticism among interviewed experts regarding the likelihood of Latvia's Public Administration adopting the user journey approach. Latvian experts and citizens are generally inclined to recommend the ACROSS Platform to friends or colleagues, but their support is somewhat less pronounced than that of the other two national cases.

The Latvian interviewees agree that the ACROSS Platform is capable of fostering the adoption of digital innovations and the digitization of processes in public organizations.

Even though the **Overall Satisfaction** impact indicator yields a score slightly below threshold, a significant portion of citizens and stakeholders recognize the Platform's utility in respect to: easing the process of utilizing cross-border services; reducing the number of public entities that citizens must engage with when seeking a cross-border service; shortening the time required to complete a cross-border service; reducing the time and expenses associated with completing cross-border services; enhancing access to cross-border services and facilitating faster resolution of mobility issues related to employment or education abroad.

The ACROSS solution and platform have a positive impact on improving the government's ability to **meet citizens' expectations** in using cross-border services efficiently. Latvian stakeholders are less optimistic about the Platform's potential to significantly aid service providers in generating new business or expanding their customer base. Nevertheless, it is acknowledged that the Platform significantly enhances the efficiency and streamlining of cross-border processes, while also minimizing the necessary interactions to complete these processes. It also has generated a very positive impact on government-citizen communication; and on the ability to pinpoint exactly the data needed to finalize a service.

The majority of Latvian stakeholders view the Platform as user-friendly. They recognise the Platform's use of clear and understandable language; its straightforward and appealing design, speed and user-friendliness. The Virtual Assistant is considered highly usable and of high quality and capable of mitigating language barriers. Nevertheless, in the view of Latvian participants, there are areas of improvement: the navigation functionalities; the time efficiency in fulfilling requests for cross-border services; the clarity of information provided for completing services through the Platform. There is some reservation on the Platform's ability to enhance citizens' control over their personal data in the context of online cross-border services, even though Latvian citizens and stakeholders have an increased confidence in securely providing their data on the ACROSS Platform compared to existing practices and they confirm that the ACROSS platform plays a crucial role in establishing a foundation of trust between governments and fostering improved cooperation among member states.

3.1.4 Commonalities and differences in the impact assessment of the three pilot use cases

As concerns the **Adoption** of the ACROSS solution and platform, all assessment cases show a very high intention to recommend ACROSS Platform to a friend or colleague, providing a significant proxy of the adoption of the solution after its industrialisation.

Except for Latvian Pilot, the other two Pilots confirm the support of the user journey method provided by the Platform. There is a general consensus that adopting the Platform would significantly enhance the digitalization of public services and experts and stakeholders believe that the ACROSS solution has the potential to support public bodies to embrace digital innovations, including eID, digital wallets, data spaces, interoperability, and more.

Country case participants concur that the platform is effective in enhancing users' control over their personal data during online cross-border service requests. The solution is capable of helping users in handling their data easily in cross-border service applications. In general, and with a minor exception of German stakeholders and experts, the ACROSS solution is considered safer than current practices and there is a wide consensus about the capability of the Platform to contribute to increase the trust among the public administration in charge of the cross-border services as well as facilitating their mutual recognition.

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With regards to **Effectiveness**, the majority of all participants in the impact assessment confirm that the full deployment and use of the ACROSS solution can facilitate and simplify the cross-border service provision. There is a high degree of satisfaction on the setup and operation of the ACROSS platform and for most stakeholders and experts have a positive view of the platform's potential to enhance cross-border processes. They recognise that using the solution will facilitate the design and delivery of cross-border services, decreasing the number of interactions required between citizens and public bodies providing the services and indirectly leading to a reduction of time and costs needed. This is also achieved by streamlining and optimising the amount of information citizens need to provide to administrations to receive the needed cross-border services, leading to significant improvements in respect to current practices.

The acknowledgement of the effectiveness of the platform in enhancing the Administration's cross-border offering is not even across all stakeholders: Greek and German participants are generally positive about the platform's potential to create new business opportunities and expand the customer base, while Latvian participants strongly disagree.

There is a wide-ranging positive perception of the **Efficiency** impact of ACROSS Platform as well as a positive perception of efficiency gains of the public organizations related to the use of the Platform. Throughout the assessment it is confirmed that the Platform would make the cross-border process more efficient and streamlined, also reducing the number of interactions needed by cross-border services by the public bodies. The ACROSS solution and platform facilitates the limitation of the amount of information necessary to the cross-border processes, further reducing the administrative burden for users and providers, not fully supported by Latvian stakeholders and experts. The ACROSS solution and platform is generally considered capable of integrating services both in English and local language, supporting public organizations in their reciprocal interactions when delivering their cross-border services. In respect to OpEx, all of the participants in the impact assessment concur that the platform and solution will unlikely reduce the relevant operational costs.

The availability of the Virtual Assistant has a major impact on the solution's **Usability**, together with its language capabilities. The assessments provided by the three country use cases are positive, but there is still room to improve the Virtual Assistant. On the overall response of the platform, stakeholders are satisfied with the easiness of navigation, with the response times and the quality of information provided, and with the performance of the application accessed on the web via mobile.

4

Conclusions: lessons learned and recommendations for policymakers

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4. Conclusions: lessons learned and
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The ACROSS project and its technological platform and solutions have demonstrated that it is possible to effectively propose practices and concrete models, including an online platform, to design and implement cross-border public and eGovernment services, addressing their complexities and constraints.

The purpose of the ACROSS platform and solution is to develop tools and good practices for EU Member State administrations and digital public service developers to design and implement cross-border eGovernment and public services supporting citizens in their needs for mobility from one EU country to the other to study or work, and following the design principles of User Centricity, Privacy Compliance and Interoperability.

The ACROSS project has developed an innovative analysis and design concept based on Design Thinking and a User Journey approach, realising a platform interconnecting administration processes delivering a one-stop portal using the once-only-principle system and supporting citizens-users in their interaction with the procedures they have to complete, aiding the understanding of the requirements, helping the navigation and the understanding and minimising the information needs and maximising their control of information delivered.

The extensive impact assessment in the three pilot case Member States Latvia, Germany and Greece, targeted at the users of the ACROSS platform and administrations who can take advantage of the platform and the design tools, confirms that the solutions, the tools and the platform itself has been well received by users and the organizations responsible for cross-border processes.

The Impact Assessment approach defined a set of thresholds for each single variable used for the assessment of the ACROSS implementation and toolbox and it shows that the results have in general been favourably received considering the criteria of Accessibility, Usability, Efficiency and Effectiveness, and Trust and its impacts on adoption. The majority of the Impact Indicators well exceeded the established thresholds and sustain the initial SWOT analysis and the qualitative Cost-Benefit Analysis (CBA).

Such evidence suggests that the Platform's exploitation is a promising opportunity for the consortium partners.

However, there are still opportunities for improvement of the platform, the solutions and tools during the industrialization phase and for the development of a full-fledged marketing strategy, which would guarantee the successful deployment of the ACROSS Platform in the EU marketplace.

Noteworthy remarks include the ones from the Latvian Pilot, revealing a minor inclination towards recommending the Platform to colleagues or friends. Similarly, respondents from Germany and Latvia show limited trust in the Platform's ability to enhance citizens' control over their personal data when utilizing online cross-border services. Furthermore, most of the pilot stakeholders agree that the Platform could pave the way for new business opportunities for service providers and to the broadening of its user base, even though the Latvian stakeholders are less positive about this aspect.

The only impact indicator thatscored under the threshold in all three pilot countries concerns the Operational Expenses (OpEx). In fact, all pilot stakeholders concur that the Platform in its current form is unlikely to help service providers reduce their operational expenses (OpEx).

To address these concerns a number of follow-up actions are suggested, namely: to undertake comprehensive communication and demonstration initiatives during the exploitation phase; to enhance the multilingual functionality currently implemented to better integrate the language element and the exchanges with the national APIs; as far as OpEx are concerned, a focused follow-up with the double purpose to better integrate the ACROSS solutions in ongoing processes and to more carefully consider the operational cost element when integrating different services in the ACROSS platform; similarly, the quality of the Virtual Assistant service should be reviewed revising the user journey adopted and looking for improvements.

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All this said, considering the state of eGovernment presented in the introduction, the issue of the availability of public digital services between EU countries is far from being resolved. The limited number of public online services in respect to those available nationally is not a problem that ACROSS can solve directly.

ACROSS has provided an approach, a platform and toolbox, which has demonstrated its capability to support the design of specific interfaces to serve stakeholders in other countries; enabling the cross-border eGovernment services to navigate the legal and regulatory frameworks of multiple countries, solving issues related to data protection, privacy, security, and interoperability; Addressing the issue of interoperability and of cross-border online user identification and authentication; tackling the greater complexity of coordination with multiple stakeholders, including governments, international organizations, and service providers across different legal contexts.

The strength of ACROSS lies in the good practices to solve cross-border service implementation and delivery issues through the platform provided. It is a powerful demonstrator of the possibilities of an integrated, user-centric approach and tool developed according to the principles of privacy-by-design, once-only, integrated interfaces and case-specific interoperability.

The scale-up and the wider diffusion of the effective ACROSS concept, as analysed in the relevant chapter on cross-border online eGovernment services, remains in the responsibility of the EU Member States and of the EU, which is in charge of the super-national aspects of sponsorship, scaling-up and diffusion. It is at this level that the issues of demand; limited cross-border digital identity management; limited cross-agency collaboration and strategic and political alignment and sponsorship; limited interoperability between different government systems and databases; demanding user-centric design and single point of access availability; privacy protection and data security by design of cross-border services, with user trust and confidence in mind; need to be addressed and solved.

5

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