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State-of-play report on digital public administration and interoperability 2020

Directorate General for Informatics

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Executive Summary

The report on the state-of-play of digital public administration and interoperability across Europe aims at providing an overview of the main developments and achievements of European countries with regards to the digitalisation of the public sector in the period 2017-2020 and the measures implemented by the European Commission to enable these countries to achieve their goals. Additionally, the results of the EIF implementation by the 36 European countries included in the sample of the study are presented in the report and then further analysed so as to provide an overview of the current state-of-play of interoperability across Europe. A proposal for future progression in this policy domain is also put forward. The results of the EIF implementation highlight that the digitalisation of public administrations strongly depends on Member States' capacity to tackle interoperability challenges.

This report sheds light on the various national initiatives that have been put in place by the 36 European countries analysed and by the European Commission to foster digital public administration and interoperability in the last three years. For many years, the European Commission has encouraged progression in this policy domain through various non-binding digital strategies and action plans as well as legislative frameworks, among others. In addition, funding programmes have been made available to European public administrations in order to boost their implementation of digital public administration and interoperability, such as the Connecting Europe Facility and the upcoming Digital Europe Programme¹. Furthermore, the ISA² Programme² is entirely focussed on the funding of interoperability projects and thus aims at bettering the life of European citizens and businesses through the provision of interoperable solutions.

The need for better and faster delivery of digital public services will take on greater urgency in the post COVID-19 era. Indeed, on 21 July 2020, EU leaders agreed on a comprehensive package of €1,824.3 billion which combines the multiannual financial framework (MFF) and an extraordinary recovery effort, Next Generation EU (NGEU). The package will help the EU to rebuild after the COVID-19 pandemic and will support investment in the green and digital transitions. In addition, the upcoming Digital Europe Programme under the 2021-2027 Multiannual Financial Framework is committed to reinforcing Europe's digital capacities in various cutting-edge domains such as high-performance computing, artificial intelligence, interoperability, cybersecurity and digital skills. One of the key actions of the Digital Europe Programme is the Shaping Europe's Digital Future strategy³, which will continue to guide the transformation of the European Union and ensure the effective implementation of digital and interoperable public services among the Member States.

1 COM/2018/434 final - 2018/0227, Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027.

2 Further information available at: https://ec.europa.eu/isa2/home_en

3 European Commission, 2020. *Shaping Europe's Digital Future*.



Introduction

Following the mandate from the European Commission Directorate-General for Informatics (DG DIGIT), and as part of the National Interoperability Framework Observatory project, which is the European observatory of interoperability as well as a business intelligence centre producing reports on digital public administration, Wavestone was requested to conduct a study on the state-of-play on digital public administration and interoperability across Europe, with an additional focus on the role of the European Commission in promoting progress in this policy domain and the implementation of the European Interoperability Framework (EIF) by European countries. In order to accomplish this study, a thorough content analysis of political communications, legislative initiatives, and digital infrastructures was carried out in order to determine the progress that has been made with regards to digital public administration and interoperability across Europe. Relevant European Union funding programmes were also briefly examined. Additionally, the results of the EIF implementation by the Member States are presented in this report and further analysed in order to provide an overview of the current state-of-play of interoperability across Europe, while outlining a proposal for future progression in this policy domain.

This report comes in the wake of a renewed European commitment to the digital transformation of Europe, particularly with regards to secure and cross-border public sector services and data⁴. The need for interoperable digital public services has been further highlighted by the COVID-19 pandemic, which has demonstrated the importance of digital technology solutions to keep citizens connected and public services functioning. By accounting for the state-of-play of digital public administration and interoperability in 2020, it is hoped that this report will also shed some light on the way forward for Europe to ensure that public services continue to meet the needs of citizens and adapt to the global trend of digitalisation, even in times of crisis.

Unless otherwise stated in individual chapters, the study will cover all 27 EU Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden), the members of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland), as well as the United Kingdom, Ukraine, Montenegro, Turkey and the Republic of North Macedonia.

The report comprises the following main sections:

- **Section 1 State-of-play of digital public administration and interoperability across the European countries:** analysing the developments and achievements of European countries with regards to digital public administration and interoperability.
- **Section 2 Role of the European Commission in promoting digital public administration and interoperability in the public sector:** describing the political communications, legislative initiatives and funding programmes of the European Commission to support the digital transformation of the European Union.
- **Section 3 Implementation of the EIF by European countries:** providing the first overview of the implementation of the EIF across the countries including in the sample.
- **Section 4 The way forward:** summarising the report and outlining proposed steps to take in the future in order to further s in this policy domain.

⁴ European Commission, 2020. *Shaping Europe's Digital Future*.

01 | State-of-play of digital public administration and interoperability across the European countries



1. State-of-play of digital public administration and interoperability across the European countries

The concept of digital public administration refers to the design and implementation of initiatives by European countries aimed at modernising their services at different levels and for various stakeholders. These initiatives can take the form of non-binding policies and strategies, roadmaps and frameworks, as well as binding legislative proposals and digital infrastructures at both national and/or subnational levels. The modernisation of public administrations via their progressive digitalisation is a continuously evolving process, adapting to technological innovations and to the needs stemming from society. In this sense, the digitalisation of public administration process strongly depends on Member States' capacity to tackle interoperability challenges. For the purpose of this report, interoperability is defined as the ability of organisations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organisations, through the business processes they support, by means of the exchange of data between their ICT systems⁵. This entails more organised and secure data exchanges, as well as better and more user-oriented, seamless services. For the drafting of this report on the state-of-play of digital public administration and interoperability, we relied on data gathered through various editions of the Digital Public Administration factsheets, from 2018 to 2020⁶. Our analysis is the result of an in-depth analysis and clustering of more than 500 data computations from 36 European countries⁷, which allowed us to draw a clear picture of the main trends identified from the political communications, legislations and infrastructures designed and implemented by European public administrations between 2017 and 2020.

⁵ European Commission, 2017. *New European Interoperability Framework: Promoting seamless services and data flows for European public administrations*.

⁶ The Digital Public Administration factsheets are issued every year by the National Interoperability Framework Observatory (NIFO), which is part of the ISA² programme. The factsheets document and monitor every aspect related to digital public administration and interoperability in the analysed countries and provide information on the actors and institutions in charge of these issues.

⁷ The countries studied are the 27 EU Member States and the United Kingdom, the members of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland) as well as Ukraine, Montenegro, Turkey and the Republic of North Macedonia.

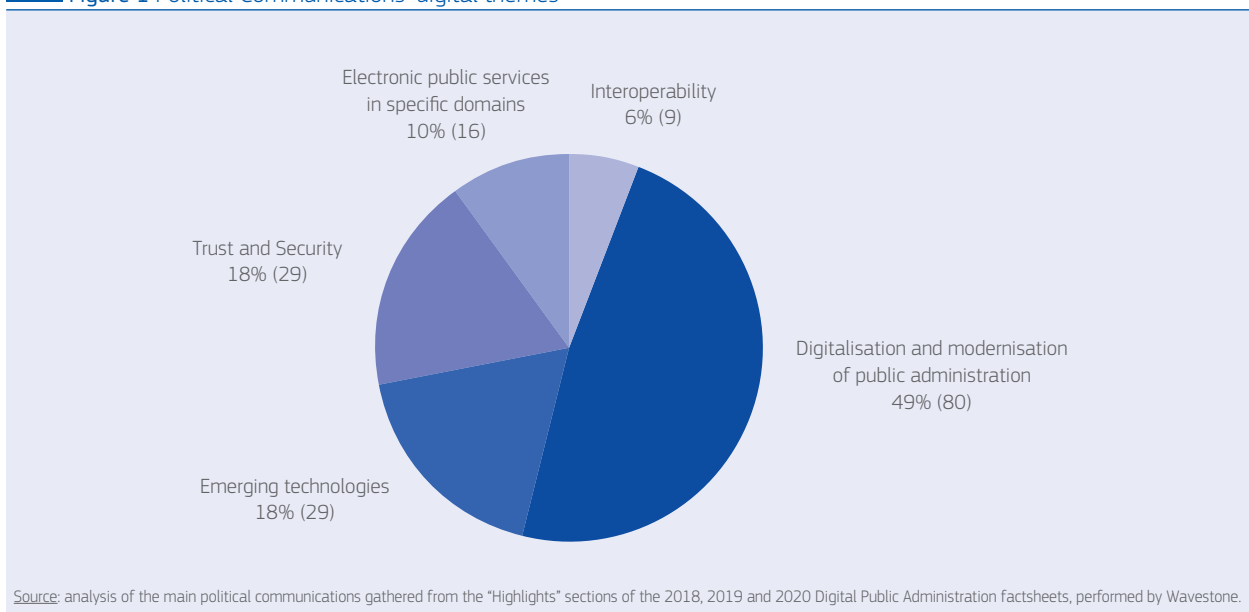
1.1 Most recent political communications supporting digital public administration and interoperability throughout Europe

Throughout Europe, the modernisation and digitalisation of public administrations is still an ongoing phenomenon. To support this process, European countries are deploying an array of political communications aimed at fostering digital public administration and interoperability. For the purpose of this report, political communications are defined as non-binding strategies, action plans and frameworks drafted by the countries' governmental bodies in order to set up future objectives and priorities in the field of digital public administration and interoperability. From 2017 through 2020, 159 new political communications were drafted to support digital public administration and interoperability in Europe. These have been grouped into clusters in order to have a better visualisation of which digital themes the analysed countries have focused on, to steer digital public administration and interoperability between 2017 and 2020.

Figure 1 shows the main digital policy areas on which the analysed countries have focused their political communications. These policy areas are then further described below by order of recurrence.



Figure 1 Political Communications' digital themes



Digitalisation and modernisation of public administration through digital strategies

Most political communications address a variety of topics falling within the scope of digital public administration and interoperability through the **elaboration of broad digitalisation strategies and ICT action plans** for the years to come, with the end goal of **enhancing the efficiency of their public administrations**, so as to ensure better public services delivery. Our analysis gathers that **69 political communications** were drafted between 2017 and 2020 in 29 European countries⁸. Norway for example, set up its reform priorities in the field of digital public administration for 2019 through a new Digitalisation Strategy for the public sector⁹, while Malta initiated a new Strategic Plan for the digital transformation of its public administration: Mapping Tomorrow¹⁰. The plan aims to transform the public administration by further simplifying its public services delivery so as to reduce the administrative burden for its users and to have user-centred public services through digital transformation. In addition, following the recast of the PSI Directive¹¹, Member States have started opening up their data through the development of national policies and strategies aimed at overcoming the barriers limiting open access to data and the re-use of public sector information. Ireland, for example, through its Open Data Strategy 2017-2020¹² made it a priority to publish high value government data in open format, making it publicly available and freely reusable to all and to engage with a broad community of stakeholders to promote the social and economic benefits of open data.

8 These countries are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Liechtenstein, Luxembourg, Malta, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, UK, Ukraine.

9 Norway's Ministry of Local Government and Modernisation, 2019. *One Digital Public Sector*.

10 Malta Information Technology Agency, 2019. *Mapping Tomorrow: A Strategic Plan for the Digital Transformation of the Public Administration*.

11 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.

12 Government of Ireland, 2017. *Open Data Strategy 2017-2020*.

Fostering public administrations' use of emerging technologies

The field of emerging technologies has also been an important focus area for many analysed countries, as public administrations are reimagining and reinventing the way they offer services to their citizens and businesses. In fact, our analysis found that 29 new political communications in this area and particularly on the uses and benefits of AI, were published between 2017 and 2020 in 22 European countries¹³. Sweden recently published a report¹⁴ on "Promoting public administrations' ability to use AI". The report provides comprehensive overview on the current status of AI in Sweden, its uses and obstacles as well as recommendations for new initiatives, which could be useful to decision-makers in government.

Enforcing trust and security measures for a more secure culture in Europe

Similarly to the field of emerging technologies, the area of **trust and security** has also been a particular focus for many countries throughout Europe in the past three years. In fact, as the number of people connected is continuously evolving, so is the number of cyber-risks and cyber-threats. Thus, governments are obliged to rethink and redraft their policies and strategies to ensure more security to their citizens. Our analysis drew that **28 new political communications** in this domain were drafted between 2017 and 2020 by 21 different countries¹⁵. These include strategies on **cybersecurity**, action plans on **data protection**, provisions on a common **cloud platform**, as well as frameworks on **eID** and **eSignature** among others. One of the most recent political communication in this field was developed by Portugal in June 2019. Through its National Strategy for Cyberspace Security 2020-23¹⁶, the country aims at guaranteeing the protection and defence of critical infrastructures and vital information services and to promote a free, safe, and efficient use of cyberspace by all citizens, companies, and public and private entities.

Further investing in electronic services in specific domains

Public administrations are continuously **investing in digital services** to ensure better public services delivery for its citizens and businesses. Digitalisation, automation and simplification are important means for governments to achieve this goal. Thus, public services are becoming more and more digital, in the financial, judicial and health sectors particularly. Between 2017 and 2020, **16 new political communications on the digitalisation of services in specific domains** have been introduced in 12 different countries¹⁷. In Cyprus, for example, further digitalisation of its judicial system would enhance transparency and subsequently improve service delivery in the long run. This is one of the objectives set out in the Cypriot National Strategy against corruption¹⁸, released in 2017.

Encouraging the use of more interoperable measures and standards

When looking at interoperability, **9 political communications**, in 9 different countries¹⁹, aimed at setting out the fundamental conditions for achieving **interoperability** within their public administrations were designed and put forward between 2017 and 2020. It is the case of Luxembourg, where in 2019, the National Interoperability Framework²⁰ (NIF) was adopted. It defines the principles, the objectives, the governance and recommendations in the field of interoperability. In addition, NIF gives specific guidance on how to set up interoperable digital public services. However, it is important to note that 8 additional countries²¹ have made interoperability one of their top priorities, albeit not through specific frameworks or actions plans dedicated to interoperability, but through broader digitalisation strategies, covering, among other things, interoperability. It is the case of Sweden's government standardisation strategy, which among others, lays the foundations for a more standardised and interoperable national approach to base registries and information exchange.

13 Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Turkey, UK.

14 Sweden's Agency for Digital Government, 2019. *Promoting public administrations' ability to use AI*.

15 Belgium, Cyprus, Denmark, Estonia, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Luxembourg, Malta, North Macedonia, Netherlands, Montenegro, Norway, Poland, Portugal, Spain, Sweden, UK.

16 Presidência do Conselho de Ministros, 2019. *Estratégia Nacional de Segurança do Ciberespaço 2019-2023*.

17 Belgium, Cyprus, Estonia, Finland, Iceland, Ireland, Latvia, Malta, North Macedonia, Poland, Turkey, Ukraine.

18 Cyprus' Ministry of Justice and Public Order, 2017. *National Strategy against corruption*.

19 Czech Republic, France, Greece, Latvia, Luxembourg, North Macedonia, Slovakia, Sweden, UK.

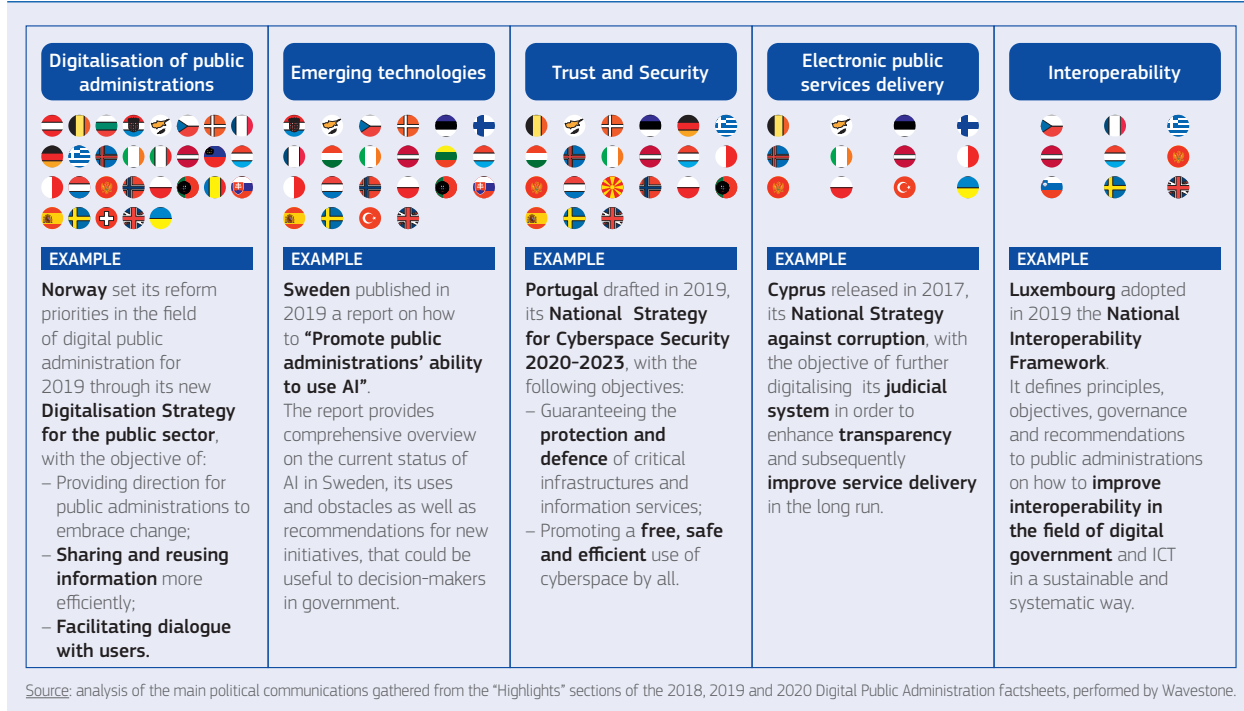
20 Ministry for Digitalisation, 2019. *National Interoperability Framework*.

21 Belgium, Croatia, Estonia, Germany, Ireland, Italy, the Netherlands, Poland.

Figure 2 below presents an analysis of the countries having put in place political communications aimed at steering digital public administration and interoperability in Europe between 2017 and 2020.



Figure 2 Analysis of the most recent political communications aimed at supporting digital public administration and interoperability

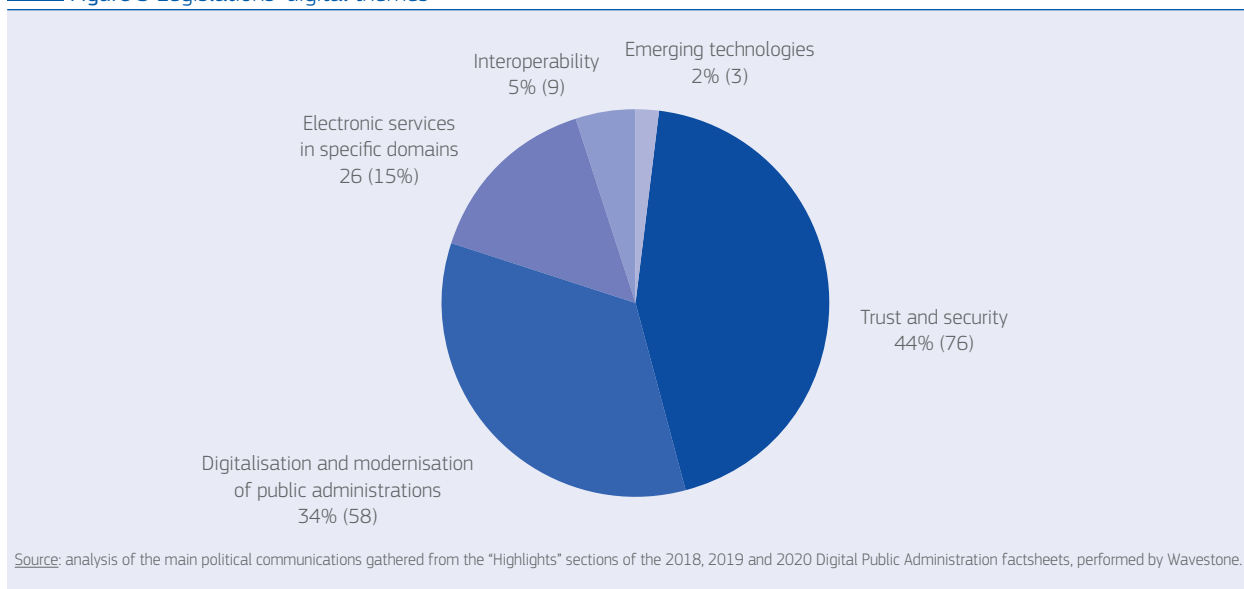


1.2 Most recent legislations supporting digital public administration and interoperability throughout Europe

The following chapter focuses on which countries have adopted **new legislative frameworks** in order to regulate various aspects related to digital public administration and interoperability. The legislative proposals have been grouped into clusters in order to have a better visualisation of the **main digital themes** that saw their legal frameworks built or enhanced between 2017 and 2020. Figure 3 below presents the main digital policy areas on which the analysed countries have focused their legislation. These policy areas are then further described below by order of recurrence.



Figure 3 Legislations' digital themes



Enforcing trust and security measures to create a security culture in Europe

Of the 174 new legislative proposals analysed in the 36 countries of our study throughout 2017 and 2020, **74 of them dealt with trust and security**. The creation of a security culture is indeed a cornerstone to implement a safe and reliable framework for digitisation across the EU. An important ratio of these legislative mechanisms was related to the implementation of the Regulation (EU) N° 910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS Regulation)²² to ensure the deployment and interoperability of electronic trust services such as eID, eSignatures, eDelivery, etc. The eIDAS Regulation clearly helped the recognition of eID and fostered the interoperability of trust services like eSignatures, eSeals or eDelivery. Furthermore, various measures had the objective of transposing the NIS Directive into national laws. Although Iceland is not an EU member, the government decided to follow the European legislative framework in terms of cyber security, with the Act No. 78/2019²³ transposing the NIS directive into the Icelandic national law. In the course of 2017, and 2018, Ireland, Malta, and Norway, took measures to adapt their national legislative framework to the General Data Protection Regulation and created specific processes to allow legal safeguards for data sharing between public bodies, but also personal data processing.

Digitalisation and modernisation of public administrations via legislation

Numerous legislative decisions taken between 2017 and 2020 aimed at enhancing digital governance and improving the efficiency of public administrations more broadly. The **39 identified legislative acts in 30 countries**²⁴ have been mostly implemented to boost the governance frameworks for digital and information technology policies across EU countries. The 'Action Publique 2022'²⁵ programme, launched in 2017 in France, is also a good example. It has three objectives; on the users-side: to improve the quality of services, by developing a relationship of trust between users and public administrations. On the public officials-side, it aims at offering a modernised work environment, fully involving public actors in defining and monitoring transformations. Lastly, on the taxpayers-side: the programme supports the reduction in public spending, with an assumed target of points of GDP by 2022. It is also important to note that, in the European Union, the public sector is one of the most data-intensive sectors. Thus, the re-use of open data can contribute to making public administrations more efficient and effective. Indeed, according to many experts, open data is an important opportunity for public administrations to exploit all the benefits of the ICTs and of the digitalisation of their data. In this regard, the Directive on open data and the re-use of public sector information, Directive (EU) 2019/1024, also known as the 'Open Data Directive' (former PSI Directive), has been an important step in this direction. Indeed, the Directive has provided a common legal framework for all Member States, paving the way towards a European market for government-held data. The transposition of this Directive into Member States' national laws will therefore enhance the efficiency of their public administrations, and consequently ensure better public services delivery.

Legislation developing electronic services in specific domains

Many European laws in sector specific domains such as eProcurement, eHealth, eTaxation, eJustice and eEducation have been adopted in recent years. These included the Directive (EU) 2011/24 on patients' rights in cross-border healthcare which set the ground for cross-border eHealth services, or the Directive (EU) 2014/24 on public procurement²⁶ which paved the way for the rapid spread of electronic public procurement across Europe, among others. This entailed the ratification and implementation at the national level of 30 legislations on electronic services in specific domains, in 15 different countries²⁷ between 2017 and 2020. Among these was Croatia, which adopted in 2019 the Act on health data and information (NN 14/2019)²⁸ providing the basis for a harmonised legal framework on the management of health data and information, while also setting the foundation for a comprehensive and more efficient use of information technologies within the framework of eHealth.

22 Regulation (EU) N° 910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS Directive).

23 Act (Iceland) No. 78/2019 on the security of networks and information systems of important infrastructures transposing the NIS directive.

24 Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine.

25 Portail de la Transformation de l'Action Publique, 2019. *Action Publique 2022*.

26 Directive (EU) 2014/24 of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive (EC) 2004/18.

27 Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Greece, Hungary, Luxembourg, Malta, Slovakia, Spain, Sweden.

28 Act (NN 14/2019) on Health Data and Information.

Towards more legal measures to increase interoperability

Interoperability is one of the key aspects at the heart of digital transformation in Europe. Throughout 2017 and 2020, **32 legislative measures were established in 24 countries²⁹ covering aspects related to interoperability** and cross-border services. These are legislative decisions aimed at developing base registries, interoperability frameworks and architecture, at promoting services fostering the 'once-only' principle, and promoting access to public information, cross-border and cross sectorial cooperation via open data and open government. In this sense, the Single Digital Gateway³⁰ has been an important step towards more interoperability in Europe, as it fostered the use of the Once Only Principle and the digitalisation of 21 procedures across the EU³¹. Additionally, more specific measures at the country level have also been adopted. For example, in 2020, Finland passed into law the Act on Public Administration Information Management (906/2019)³², which includes a requirement for government agencies to utilise datasets of other government agencies whenever possible and it prescribes to the Ministry of Finance a general coordination task of interoperability of public sector data sets.

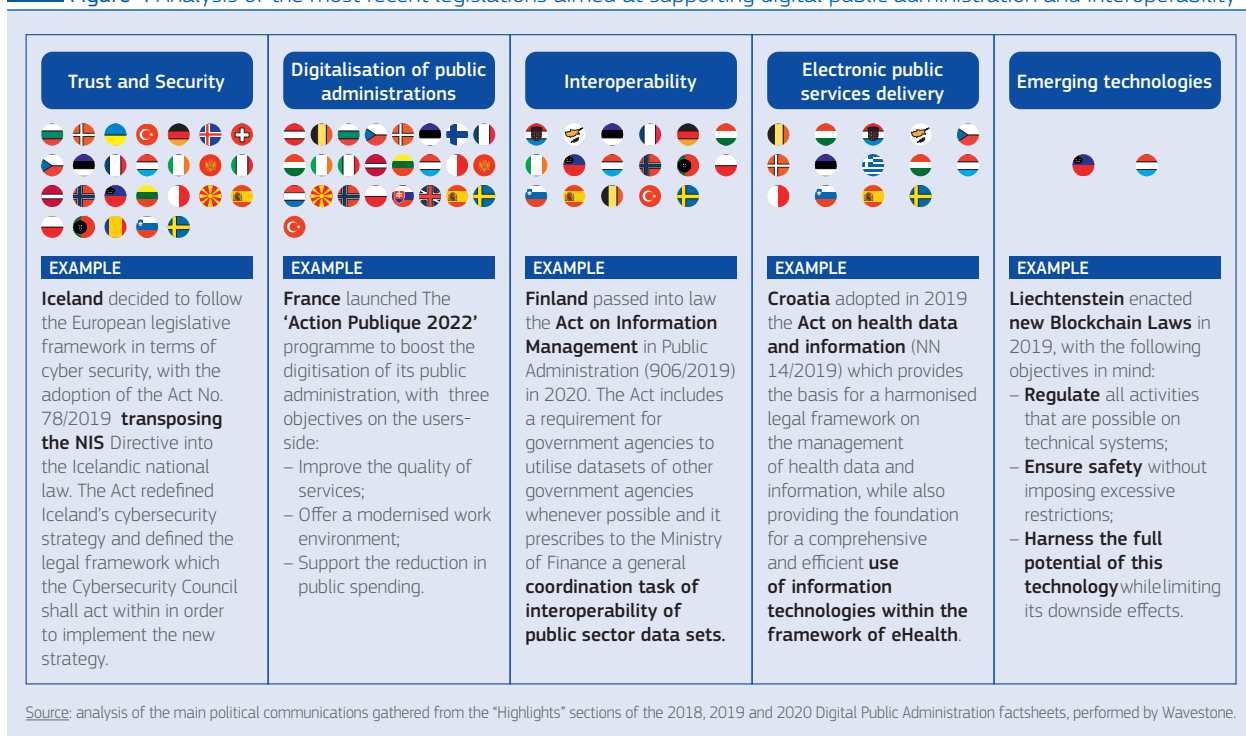
Regulate emerging technologies in order to foster digitalisation in public administrations

Finally, three initiatives were proposed in Luxembourg and the Liechtenstein to anticipate and **regulate the use of emerging technologies** such as Blockchain, that could represent a fundamental innovation in digital trust services. Liechtenstein enacted new Blockchain Laws³³ in 2019 that intend to regulate all activities that are possible on technical systems and to ensure safety without imposing excessive restrictions. It should be noted that Blockchain technology represents a unique opportunity for EU countries to develop new interoperable solutions for personal records such as health records or contract management³⁴.

Figure 4 below presents an analysis of the countries having put in place legislations aimed at supporting digital public administration and interoperability in Europe between 2017 and 2020.



Figure 4 Analysis of the most recent legislations aimed at supporting digital public administration and interoperability



29 Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, North Macedonia, Norway, Poland, Slovakia, Spain, Sweden, Turkey, UK.

30 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.

31 By December 2023 at the latest, the list of 21 important administrative procedures will be made available online for all the EU countries.

32 Act (906/2019) on Public Administration Information Management.

33 Law of 3 October 2019 on Tokens and TT Service providers (Token and TT Service Provider Act; TVTG) also referred to as 'Blockchain Act'.

34 On this subject, one might mention the Vehicle Wallet initiative in Denmark that allows a partnership between payment service provider and the tax administration to share record of a vehicle's history as it is transferred across the supply chain.

1.3 Most recent digital infrastructures put in place to support digital public administration throughout Europe

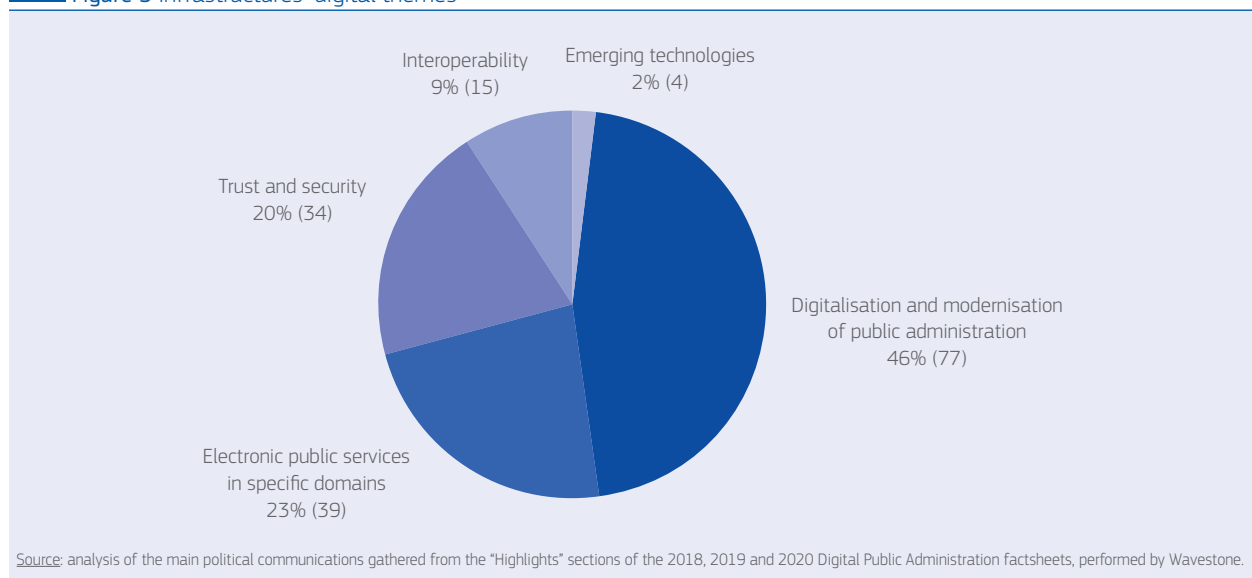
In order to introduce new digital services for citizens and businesses, governments first need to design and deploy reliable digital infrastructures. By digital infrastructures, **we refer to eGovernment systems and technologies underpinning the development and delivery of digital public services and the digitisation of public administrations more broadly.** We used them to cluster newly adopted digital technologies and systems. Thus, the following chapter will highlight the countries' progress in building these **digital public administration infrastructures** in the period 2017 - 2020.

The analysis of measures supporting digital public administration infrastructures since 2017 throughout 2020 reveals, by order of importance, that most of the **170 actions taken by countries** are related firstly to the digitalisation and modernisation of public administrations so as to make them **more efficient and effective**, with the end goal of ensuring a simpler and thus better delivery of public services to citizens and businesses. Then, most of the new digital infrastructures were deployed via **electronic services in specific domains**: such as eProcurement, eInvoicing, eTaxation or eJustice. Thirdly, 47 of infrastructures deployment for the 2017-2020 had the objective to foster **interoperability and cross-border services** with the creation of information sources and frameworks, ensuring the Once Only principle. These information sources were mainly base registries that had the objective to enable more efficient data exchange. Fourthly, **trust and safety** measures to secure frameworks and ensure reliable data exchange for government, citizens and businesses, have been also at the centre of the agenda in countries' progress to build digital public infrastructures with important achievements in electronic identification, procurements and cyber security. Finally, following Europe's impetus to become a leader in **emerging technologies**, some countries started to implement infrastructures to harness the potential of trending and promising innovations. Their ambition is to apply these technologies to the public sector, stimulate innovation, and ensure that their benefits will be accessible to the public and private sector, but also, and more importantly, to EU citizens.

Figure 5 below presents the main digital policy areas on which the analysed countries have focused to build new infrastructures. These policy areas are then further described below by order of recurrence.



Figure 5 Infrastructures' digital themes



Improving systems and technologies to ensure the digitalisation of public administrations

The clustering we have made to analyse new outputs shows that many decisions were made by countries to either align their already existing digital services or update them to **provide more efficiency to their public administrations**. In this sense, 55 public services platforms (these were mainly gateway and digital points of contact) created or improved in 30 different countries³⁵. Estonia, for example, renewed in 2019 its gateway to government information and e-services, ‘the eesti.ee’ portal³⁶, which coordinates the information and the services offered by the various state institutions to the citizens, ensures a safe Internet environment for communicating with the state and offers reliable information and digital solutions for citizens, entrepreneurs and officials.

Deploying more digital infrastructures in e-services specific realms

In terms of **designing and deployment of electronic services in specific domains**, eInvoicing and eProcurement are starting to make their way into government’s infrastructures. We identified 38 of them in 18 countries³⁷. Italy, for example, put in place a new ePayment service called PagoPA³⁸, which allows citizens and businesses to make electronic payments to the public administration on the basis of rules, standards and tools defined by the Agency for Digital Italy and accepted by public administration bodies, banks, post offices and other payment institutions.

Trust and safety infrastructures

On the **trust and security aspect**, 32 actions taken in terms of infrastructure creation were made in order to create an operable framework to comply with the eIDAS regulation. Belgium, Croatia, Czech Republic, Denmark, Estonia, Germany, Italy, Latvia, Lithuania, Luxembourg, Slovakia, Spain, the Netherlands, Portugal and the UK have either notified or pre-notified their eIDs schemes under eIDAS between 2017 and 2020³⁹. It ensured that public administrations, EU people, and businesses, could use trusted electronic identification to digitally authenticate themselves while using online services within and across their country, in a secure and protected way. In addition, thanks to the eIDAS Regulation, from November 2019, the citizens of 6 EU Member States can now use their national eID schemes across borders. Indeed, all Member States are now obliged to recognise the German National Identity Card and Electronic Residence Permit, the Italian eID means of SPID (Public System of Digital Identity), six Estonian eID means (ID card, RP card, Digi-ID, e-Residency Digi-ID, Mobiil-ID, Diplomatic identity card), the Spanish DNIE, the Luxembourgish National Identity Card and the Croatian Personal Identity Card (eOI)⁴⁰.

Interoperability frameworks

In addition to the already **implemented National Interoperability Frameworks**, 22 countries⁴¹, as Spain, renewed theirs to adapt its content to new provisions in 2018. The same year, in order to ensure a service-oriented and standardised connection between the national base registries and the different specific public administration information systems, Hungary implemented the Hungarian Central Governmental Service Bus (*Központi Kormányzati Szolgáltatás Busz – KKSzB*)⁴².

Releasing the power of emerging technologies

Finally, 4 actions made by countries tend **to reveal the undergoing process of digitisation via emerging technologies**. In 2019, Luxembourg created a new Cybersecurity Competence Centre⁴³ to promote a national cybersecurity ecosystem. The same year, in January 2019, the Grand Duchy became the first European country to launch an AI collaboration with NVIDIA⁴⁴, a world-class company in AI and technology and GPU computing. All these projects will alleviate economic development and can help the digitisation of public administrations by fostering innovation and apply such novelties in the infrastructures dedicated to facilitating interoperability and cross border services in an innovative, cost saving and more efficient way.

35 Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, North Macedonia, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK, Ukraine.

36 Further information available at: <https://www.eesti.ee/et/>

37 Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Germany, Hungary, Italy, Latvia, Liechtenstein, Malta, Netherlands, North Macedonia, Romania, Slovakia, Switzerland, Turkey and the UK.

38 Further information available at: <https://www.agid.gov.it/piattaforme/pagopa>

39 CEF Digital, Overview of notified and pre-notified eIDs schemes under eIDAS. Last update: January 2020.

40 European Commission, 2019. National eIDs of 6 countries available for the EU citizens to use cross-border.

41 Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Montenegro, North Macedonia, Norway, Poland, Slovenia, Sweden, Switzerland, Ukraine.

42 Further information available at: <https://idomsoft.hu/rolunk/termekek-es-szolgalatasok/termekeink/kkszb/>

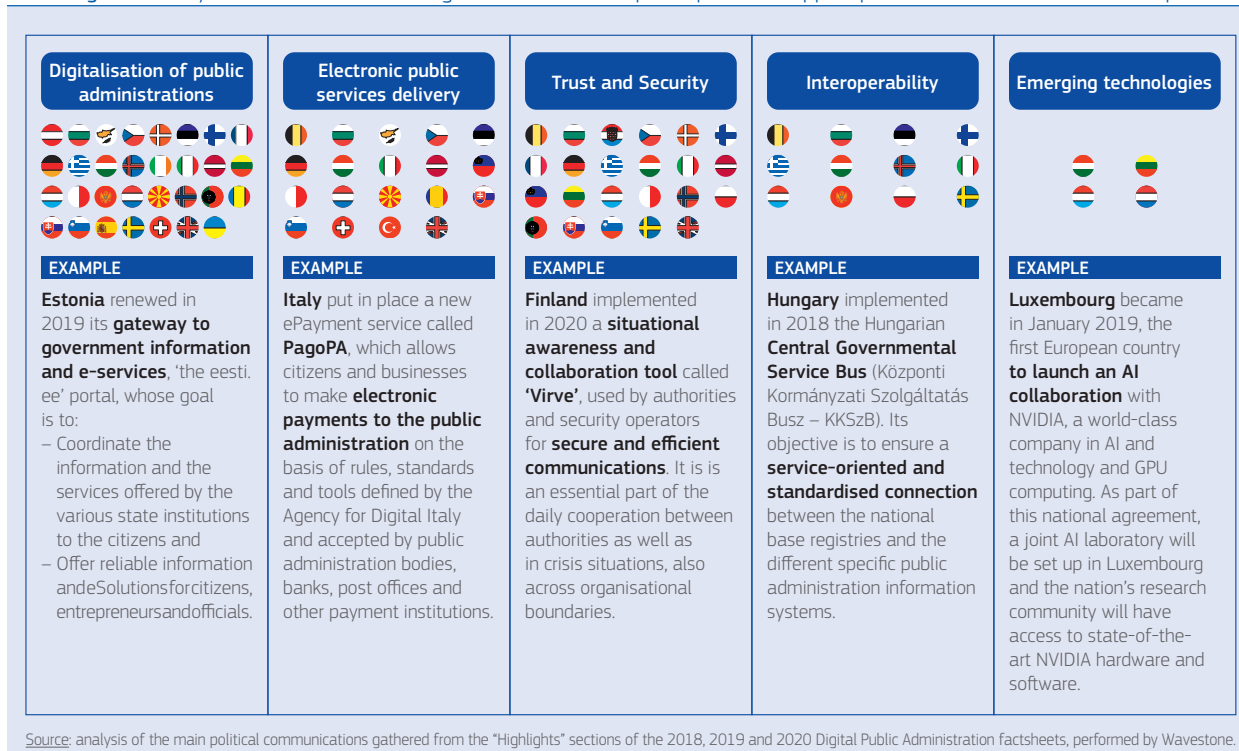
43 Further information available at: <https://www.c-3.lu/>

44 Further information available at: https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2019/01-janvier/30-bettel-partenariat-nvidia.html

Figure 6 below presents an analysis of the countries having put in place legislations aimed at supporting digital public administration and interoperability in Europe between 2017 and 2020.



Figure 6 Analysis of the most recent digital infrastructures put in place to support public administration and interoperability



1.4 Main actors of digital public administration and interoperability oversight

In order to ensure a timely and smooth implementation, coordination and monitoring of digital public administration and interoperability activities, European governments have delegated responsibilities to various actors either at the national, regional or local levels. These actors can take the form of dedicated ministerial bodies or independent agencies focused on digitalisation, among others. This chapter aims to shed light on the various actors across Europe that are involved in the policy-making process of digital and interoperable solutions. Most recent data from the Digital Public Administration factsheets 2020 were taken into consideration for this analysis.

1.4.1 National level

Due to different administrative structures and histories, European countries dispose of a varying number of actors which are responsible for activities related to digital government and interoperability. For the purpose of this study, these activities are: the policy or strategy setting, its coordination, implementation, support, audit and data protection. Our analysis has demonstrated that, depending on the country, the responsibilities of the policy-making cycle can lie in the hands of either one or of various governmental bodies. In fact, Spain, Estonia, Croatia, Switzerland and Cyprus are the countries with the highest number of actors responsible for digital government and interoperability policies. These countries count between 13 and 15 institutions in charge of either the policy or strategy setting, its coordination, implementation, support, audit or data protection. At the other end of the spectrum, there are countries like Liechtenstein, Iceland, Poland, Latvia and the Netherlands with only 4 or 5 institutions responsible for the various aspects of digital government and interoperability strategies.

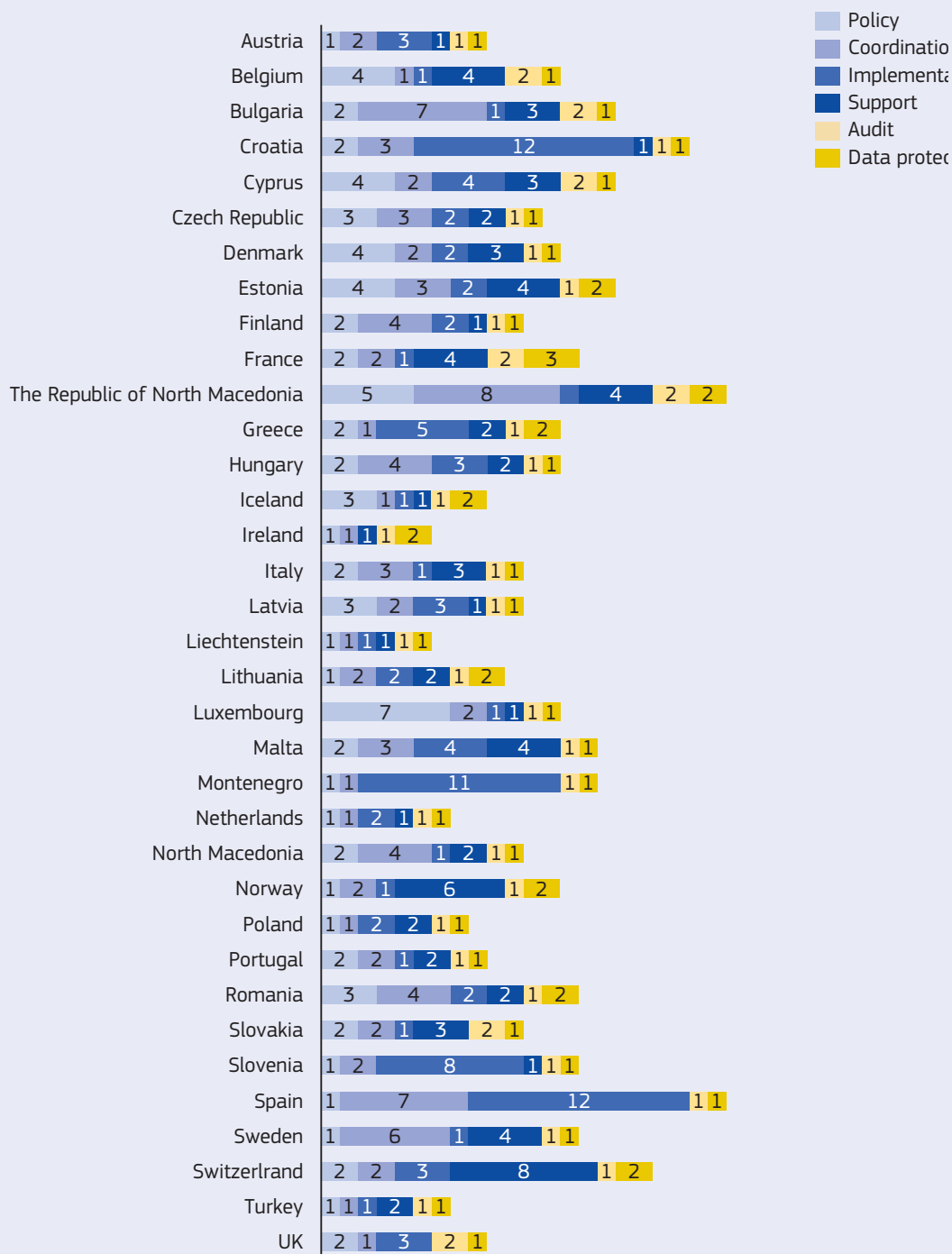
In addition, the number of governmental actors responsible for each stage of the policy cycle can vary significantly. In fact, in some countries, one governmental body may be responsible for a single stage of the policy-cycle, while in some other countries, various actors are steering one single stage of the cycle. In Croatia, for example, there are 13 governmental bodies responsible for the implementation of digital public administration policies, while Bulgaria only counts one actor responsible for this stage of the policy-cycle. More importantly, one single body may be responsible for various stages of the policy-cycle. In the Czech Republic, for example, the same governmental body, the Ministry of Interior, is responsible for five steps of the policy-making cycle, namely the policy setting, its coordination, implementation, support as well as interoperability coordination.

Our analysis also depicted that an increasing number of countries has created new ministerial departments and/or independent digitalisation-focused agencies solely responsible for digital public administration and/ or interoperability oversight in their country. In the Netherlands, for example, the Government has set-up an ICT Unit, named ICTU, which is considered as an independent consultancy for the government, whose objective is to support it with the development and implementation of innovative ICT solutions. ICTU is also the main body responsible for interoperability activities in the country.

Figure 7 below provides an overview of the main actors responsible for each stage of the policy cycle at the national level.



Figure 7 Digital public administration responsibilities at the national level



Lastly, our analysis illustrated that various countries had specific bodies responsible for setting and coordinating interoperability policies, which differed from the overarching national bodies responsible for setting digital public administration policies. Hence, Table 1 below presents the overarching bodies responsible for digital public administration policies or strategies as well as the institutions responsible for interoperability activities.



Table 1 Overarching bodies responsible for setting digital public administration and interoperability policies

Countries	Bodies responsible for setting digital public administration policies	Bodies responsible for interoperability policies
Austria	Federal Ministry for Digital and Economic Affairs	Platform Digital Austria (PDA)
Belgium	Federal Public Service Policy and Support (BOSA)	Federal Public Service Policy and Support (BOSA)
Bulgaria	The Ministry of Transport, Information Technology ⁴⁵	State eGovernment Agency
Croatia	Ministry of Public Administration ⁴⁶	Ministry of Public Administration
Cyprus	eGovernment Board	Department of Information Technology Services
Czech Republic	Ministry of the Interior	Ministry of the Interior
Denmark	Ministry of Finance	Agency for Digitisation
Estonia	Ministry of Economic Affairs and Communications (CIO Office) ⁴⁷	Information System Authority (RIA)
Finland	Ministry of Finance	Ministry of Finance
France	Secretary of State for Digital Affairs ⁴⁸	Interministerial Directorate for Digital Affairs (DINUM)
Germany	IT Planning Council	IT Planning Council
Greece	Hellenic Ministry of Digital Governance	Hellenic Ministry of Digital Governance
Hungary	Ministry's Deputy State Secretariat for Informatics	Ministry's Deputy State Secretariat for Informatics
Iceland	Ministry of Finance and Economic Affairs	Ministry of Finance and Economic Affairs
Ireland	Department of Public Expenditure and Reform	Department of Public Expenditure and Reform
Italy	Ministry of Innovation Technology and Digitalisation	Agency for Digital Italy (Agenzia per l'Italia digitale)
Latvia	Ministry of Environmental protection and regional development	Ministry of Environmental protection and regional development
Liechtenstein	Ministry of General Government Affairs and Finance	Liechtenstein State Administration
Lithuania	Ministry of Economy and Innovation ⁴⁹ Information Society Development Committee	Ministry of Economy and Innovation Information Society Development Committee

















⁴⁵ The Ministry of Transport, Information Technology and Communications (MTITC) is the main body responsible for Bulgaria's IT and eCommunication strategy/policy in general.

⁴⁶ The Ministry of Public Administration participates in the promotion and improvement of IT infrastructure and the development of ICT, eGovernment, eEducation and eBusiness, more generally.

⁴⁷ The Government CIO Office, within the Ministry of Economic Affairs and Communications is responsible for the coordination of digital government development and national cybersecurity policy more precisely.

⁴⁸ The French Secretary of State for Digital Affairs nevertheless relies on the Inter-ministerial Directorate for Digital Affairs (DINUM) for implementation of eGovernment policy.

⁴⁹ The Lithuanian Ministry of Economy and Innovation is the body responsible for setting digital, eGovernment and interoperable policies while the Information Society Development Committee is the main body responsible for implementing these policies.

Countries	Bodies responsible for setting digital public administration policies	Bodies responsible for interoperability policies
 Luxembourg	Ministry for Digitalisation	Government IT Centre
 Malta	Malta Information Technology Agency (MITA)	Malta Information Technology Agency (MITA)
 Montenegro	Ministry of Public Administration	Ministry of Public Administration
 The Netherlands	State Secretary for the Interior and Kingdom relations	The Dutch eGovernment Implementation Organisation (ICTU)
 North Macedonia	Ministry of Information Society and Administration (MISA)	Ministry of Information Society and Administration (MISA)
 Norway	Department of ICT Policy and Public Sector Reform	Norwegian Digitalisation Agency
 Poland	Ministry of Digital Affairs	Ministry of Digital Affairs ⁵⁰
 Portugal	Minister for State Modernisation and Public Administration	Administrative Modernisation Agency
 Romania	Authority for Digitising Romania	Ministry of Communications and Information Society (MCSI)
 Slovakia	Division of the Information Technologies of the Public Administration	Division of the Information Technologies of the Public Administration
 Slovenia	Ministry of Public Administration	Public Administration Information Technologies Division
 Spain	Ministry of Economic Affairs and Digital Transformation	Secretariat General for Digital Administration
 Sweden	Ministry of Infrastructure	Agency for Digital Government (DGG)
 Switzerland	eGovernment Switzerland	eGovernment Switzerland
 Turkey	Digital Transformation Office	Digital Transformation Office
 Ukraine	Ministry of Digital Transformation	Ministry of Digital Transformation
 United Kingdom	Cabinet Office	Government Digital Service ⁵¹

Note: last update in June 2020

Source: analysis of the main actors gathered from the 2018, 2019 and 2020 Digital Public Administration factsheets, performed by Wavestone.

1.4.2 Subnational levels (regional and local)

In various countries, due to the composition of their governments, some responsibilities of the policy-making cycle can also lie in the hands of subnational actors, whether at the regional or at the local level. This is the case of federal countries such as Belgium for example, where responsibility for digital government lies in the hands of the three regional Ministers, each in charge of its own region. The same scenario is depicted in Germany, where each Länder can count on its own digitalisation strategy put forward by its responsible regional government.

⁵⁰ Although according to the National Interoperability Framework, each public institution is accountable for assuring interoperability of its systems and infrastructures.

⁵¹ The Government Digital Service is part of the Cabinet Office.

Interview with Barbara Ubaldi to gather some insights on digital government and interoperability



Barbara UBALDI

Senior Project Manager and Head of the Digital Government and Open Data Unit at the Organisation for Economic Cooperation and Development (OECD)

Based on your experience, how would you define the concept of 'digital government'?

The definition of digital government can only be fully understood if compared with the definition of eGovernment. In fact, digital government is understood as the use of data and technology to connect the administrations, to foster integration and horizontality, and advance in digital maturity across the different policy sectors. While in comparison, the definition of eGovernment was more focused on the online transfer of data, processes and services. In addition, in the past, this effort was mostly driven by individual sectors (i.e. individual ministries transforming everything from paper to electronic) while digital government entails cross-sector cooperation and integration. Thus, digital government is really about abandoning completely the idea of simply transferring online processes that exist and therefore utilise data and technology to cut down silos. In addition, continuity in the political support is one of the main factors influencing the sustainability of digital government services. Unless digital government is continuously considered as a core priority in the political agenda across governments, then efforts will be discontinued and not sustainable.

How would you define 'interoperability' and how important is it for the implementation of digital government nowadays across sectors?

Interoperability is essential for the implementation of digital government. Unfortunately, people tend to think that interoperability can only be understood from a technical point of view (i.e. interoperability of systems that need to talk to each other), while interoperability should also be understood in terms of data and processes, that allows for a better implementation of digital government. In fact, interoperability is one of the key essential enablers of digital government. As previously mentioned, digital government implies cutting down silos and integrating horizontality, among others, and for this to happen, interoperable data and processes need to first be put in place.

What are the main policy priorities of governments in terms of digital government both among the EU27+ and among the OECD Member States?

In Europe, countries like Finland, Sweden and Italy have prioritised their work on emerging technologies and on Artificial Intelligence (AI) in particular, as core future developments of digital government. More broadly, Korea and Colombia have also been prioritising the use of emerging technologies a lot. They are all among the leading countries driving, from a political point of view, the efforts on AI. Notwithstanding emerging technologies, the other main policy priorities of the years to come will include data (people and financial resources) and digital skills, which will be at the core of all digital transformation strategies, and consequently at the core of digital government.

What are the current challenges that these governments are facing when adopting and implementing digital government?

The main challenge that governments continue to face in adopting and implementing digital government is a cultural one. In fact, many administrations remain very bureaucratic and hold onto a culture that is very much driven by mandates, agendas and objectives of individual ministries (which correspond to policy areas such as education, health, transport, social services). This type of administrative culture completely contradicts the nature of digital government, which needs to be able to link, liaise, create synergies and integrate, and is thus considered as one of the biggest challenges to the good implementation of digital government. In addition, many governments still claim that they lack the skills and talent needed within the administration to fully implement digital government. In fact, many people still lack the main technical digital skills but also broader agile skills that would allow them to work across barriers and sectors and to better collaborate.

02 | Role of the European Commission in promoting digital public administration and interoperability in the public sector



2. Role of the European Commission in promoting digital public administration and interoperability in the public sector

In order to promote the modernisation and digitalisation of public administrations across the European Union (EU), the European Commission has played a crucial role, deploying an array of **political and legislative initiatives** financially supported by various **funding programmes** in order to foster digital public administration and interoperability at the Member State level. Indeed, while Commission priorities may shift with the election of a new President, the prioritisation of the **digital transformation of the EU** has remained a constant in the last two decades, particularly with regards to digital public administration and interoperability. While always a priority, it was during Jean-Claude Juncker's tenure as Commission President that digital public administration and interoperability were at the fore. Rather than merely incorporating this domain into broad-spectrum policies and legislative initiatives, the Juncker Commission prioritised it as a separate matter, dedicating entire funding programmes and initiatives to advance digital public administration and interoperability across the European Union.

The groundwork laid down by the Juncker Commission provided the von der Leyen Commission with a strong foundation to continue to promote the growth of **European digital public services**. Indeed, some of the earliest pledges from President Ursula von der Leyen focus on reinforcing the achievements of the Juncker Commission, in addition to implementing newer initiatives to address developments in **emerging technologies such as artificial intelligence, blockchain and tools to allow data better sharing and usage of data**. While such technologies may seem intangible, they can be easily tied to interoperability and digital public administration, given their potential to enhance the way we collect, process, and protect data, and the way in which we make decisions at the political level. In light of the achievements of the Juncker Commission and the proposed approach of the von der Leyen Commission, this chapter aims to take account of the state-of-play of digital public administration and interoperability in the EU by examining the political and legal context in the period 2017-2020. An analysis of the transition phase from the Juncker Commission to the von der Leyen Commission is also conducted in order to highlight the continuation and evolution of specific priorities in this domain.

2.1 Most recent European Commission political initiatives supporting digital public administration and interoperability throughout Europe

Older political initiatives led by the Juncker Commission, such as the Digital Single Market Strategy⁵², the eGovernment Action Plan⁵³, Tallinn Ministerial Declaration on eGovernment⁵⁴, and the revised European Interoperability Framework⁵⁵ have left a strong legacy in the digital transformation of the European Union. Although in its early days, the von der Leyen Commission has shown no intent of changing tack. Rather, it seems as though it is ramping-up efforts to bolster the digital transformation of the European Union, particularly with regards to digital public administration and interoperability, building off its predecessors' achievements.

2.1.1 *Shaping Europe's Digital Future*

As part of the European Commission's priority for 2019-2024, **A Europe Fit for the Digital Age**⁵⁶, President von der Leyen has repeatedly stressed the need for Europe to lead the transition to a new digital world. The political communication **Shaping Europe's Digital Future**⁵⁷ is the Commission's overarching strategy to guide the EU's digital transformation, and if implemented in full, it will have a strong impact on the implementation of digital public administration and interoperability. In addition to heavily investing in emerging technologies, the new digital strategy of the Commission foresees two key actions to address digital public administration and interoperability:

52 European Commission, 2015. *A Digital Single Market Strategy for Europe*.

53 Further information available at: <https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020>

54 Further information available at: <https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-egovernment-tallinn-declaration>

55 European Commission, 2017. *European Interoperability Framework – Implementation Strategy*.

56 Further information available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en

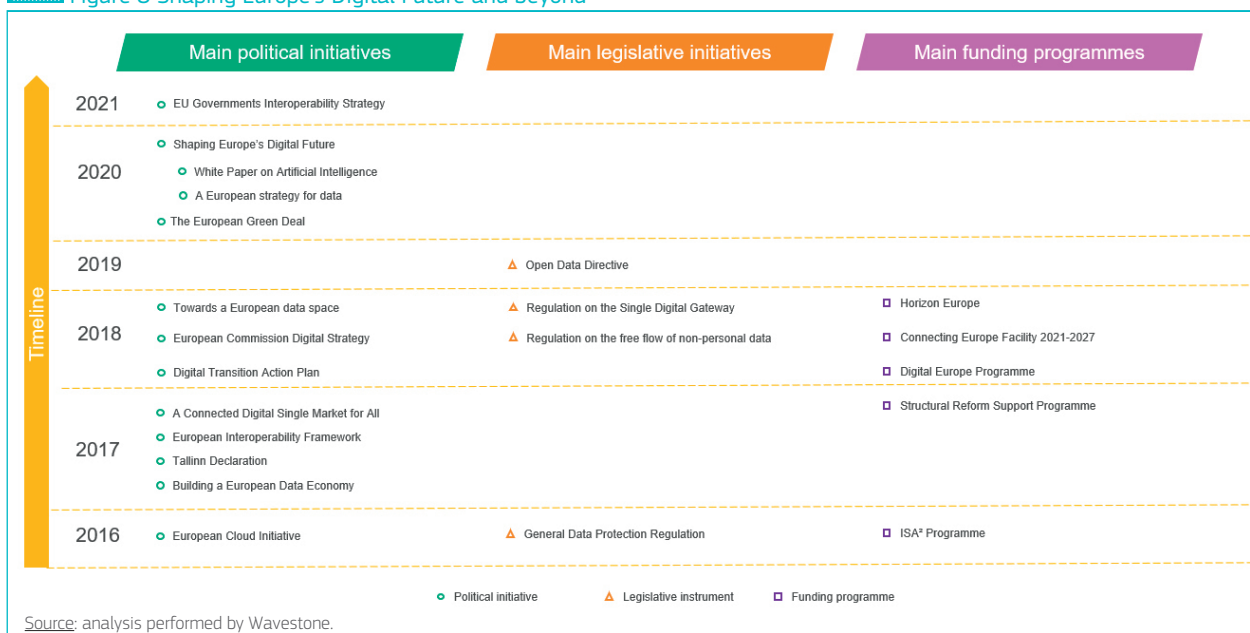
57 European Commission, 2020. *Shaping Europe's Digital Future*.

- **A strategy for standardisation**, which will allow for the deployment of interoperable technologies respecting Europe's rules, and promote Europe's approach and interests on the global stage. This action, foreseen for implementation in autumn 2020, will help ensure that ICT specifications are properly standardised in order to facilitate interoperability between devices, systems, and services in public administration.
- **A reinforced EU governments interoperability strategy** to ensure coordination and common standards for secure and borderless public sector data flows and services. This action, foreseen for implementation in 2021, will build off previous interoperability and standardisation strategies to encourage digital public administration and interoperability throughout the EU.

Shaping Europe's Digital Future will guide the implementation of the European Commission's political and legislative initiatives related to the digital transformation of the European Union, and associated funding programmes until 2024 (see Figure 8). Thus far, two key actions developed within the framework of the Shaping Europe's Digital Future strategy were published in early 2020; the **European Data Strategy**⁵⁸ and a **White Paper on Artificial Intelligence**.⁵⁹ Both political communications have since been adopted by the Commission and are currently in the early phases of implementation.



Figure 8 Shaping Europe's Digital Future and beyond



What is the new European Data Strategy?

The European Data Strategy communication outlines a vision of a genuine single market for data which tackles the problems that have been identified through various policy measures and funding. The Strategy envisions an interoperable data space that allows data to flow freely within the EU and across sectors, where European rules and values are respected in full, and the rules for access to and use of data are clear, practical, and trustworthy. The foreseen data space is intended to aid public administrations in their mission to use data for the provision of citizen-centric public services, increase efficiency in a low-cost manner, and aid interoperability.

This strategy builds off steps taken by the Juncker Commission from 2014 onwards, particularly with regards to the General Data Protection Regulation and the framework of digital trust that it established. The Regulation on the Free Flow of Non-personal Data, the Cybersecurity Act, and the Open Data Directive have also contributed to laying the groundwork for the von der Leyen Commission to continue developing ambitious strategies to catalyse the digital transformation of the European Union and aid the implementation of digital public administration and interoperability. With regards to the current state-of-play, the European Data Strategy is still in development. The European Commission ran an online public consultation for this strategy until 31st May 2020, the results of which will feed into possible Commission initiatives and proposals within the scope of this strategy in the coming years.

58 Further information available at: <https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy>

59 Further information available at: https://ec.europa.eu/info/publications/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en

White Paper on Artificial Intelligence: a European approach to excellence and trust

The White Paper on Artificial Intelligence marks the first major publication as part of the European Union's strategic goal of *Shaping Europe's Digital Future*. The White Paper outlines the European Commission's proposed approach to the regulation of artificial intelligence, with the aim of promoting Europe's capacity to innovate in this field while simultaneously supporting the development and uptake of ethical and trustworthy artificial intelligence throughout the European Union, particularly in public administrations.

The White Paper builds off work carried out by the Juncker Commission in this policy domain, including the Coordinated Plan on Artificial Intelligence, the Communication on Building Trust in Human-Centric Artificial Intelligence, the Ethics Guidelines for Trustworthy Artificial Intelligence, the Report on liability for Artificial Intelligence and other emerging technologies, and the Declaration of Cooperation on Artificial Intelligence. Similar to its predecessor, the von der Leyen Commission is prioritising the development of policies pertaining to Artificial Intelligence, promising to propose legislation with the first 100 days in office. Although the Commission did not initiate a legislative process within this timeframe, the White Paper nevertheless marks a step in the right direction, proposing various potential visualisations of future legislation in this domain. Additionally, the White Paper was open to a public consultation until 14th June 2020, the results of which will undoubtedly be taken into consideration by the new Commission when proposing legislation in the near future.

2.1.2 European Cloud Initiative

The **European Cloud Initiative**⁶⁰ is the Commission's blueprint for cloud-based services and world-class data infrastructure, intended to strengthen Europe's position in data-driven innovation, improve competitiveness and cohesion, and help with the creation of a Digital Single Market in Europe. It aimed at unlocking the power of **big data for open science** at a European level and thus building a competitive data and knowledge economy in Europe. By developing pilot projects for eGovernment and other public administration stakeholders, making data more easily available to such actors, and fostering **efficient and interoperable data sharing** throughout a multidisciplinary, multi-actor approach, the European Cloud initiative has greatly helped with the promotion and implementation of digital public administration and interoperability.

Given the ongoing nature of the initiative, it is difficult to fully assess whether the intended goals of the European Cloud Initiative have been achieved, and thus far, an evaluation has not been conducted. In 2017, the European Parliament's Committee on Industry, Research and Energy (ITRE) did publish an own-initiative report welcoming the European Cloud Initiative.⁶¹ However, ITRE expressed concern over a EUR 4.7 billion financing gap and asked for a clear action plan with estimated timelines. In spite of financing concerns, the initiative has indeed succeeded in the implementation of several key actions, including the creation of a **European Open Science Cloud** by 2016, the opening up of all scientific data produced under Horizon 2020 projects by 2017, and the launch of a flagship initiative for quantum technology by 2018. The Commission intends to develop a **European high-performance computing, data storage and network infrastructure** by 2020, as part of this initiative.⁶²

2.1.3 Digital Transition Action Plan

The **Digital Transition Action Plan**⁶³ was published in 2018 examining how to effectively implement the eGovernment Action Plan 2016-2020⁶⁴ at the local government level. The objective of the Digital Transition Action Plan is to provide **better public services to citizens with help of digital tools**, to support European cities in exploiting the possibilities of digitalization, and to assist European businesses to develop new innovations and create new business opportunities for global markets. The Action Plan is a product of the Digital Transition Partnership⁶⁵, building off other Juncker Commission achievements such as the Digital Single Market Strategy, the eGovernment Action Plan, the Tallinn Ministerial Declaration on eGovernment, and the Urban Agenda for the EU⁶⁶. With regards to the current state-of-play of the Digital Transition Action Plan, the Commission conducted a public consultation in order to gather feedback and is currently focused on the implementation phase of the plan.⁶⁷ Further details are unavailable at this time.

60 European Commission, 2016. *European Cloud Initiative – Building a competitive data and knowledge economy in Europe*.

61 European Parliament, 2017. *Report on the European Cloud Initiative (2016/2145(INI))*.

62 Further information available at: https://ec.europa.eu/commission/presscorner/detail/en/IP_16_1408

63 Urban Agenda for the EU, 2018. *Digital Transition Action Plan*.

64 European Commission, 2017. *EU eGovernment Action Plan 2016-2020 – Accelerating the digital transformation of government*.

65 Further information available at: <https://ec.europa.eu/futurium/en/node/1963>

66 Further information available at: <https://ec.europa.eu/futurium/en/urban-agenda>

67 Further information available at: <https://ec.europa.eu/futurium/en/digital-transition/actions>

2.2 Most recent European Commission legislative instruments supporting digital public administration and interoperability throughout Europe

In recent years, the European Commission has regulated several subject matters in the domain of digital public administration and interoperability such as electronic identification (eIDs), electronic invoices (eInvoices), cloud computing, information platforms, data storage, and the provision of open data. Based on the ambitions of the current Commission, as outlined in the strategy *Shaping Europe's Digital Future* and the Commission's Annual Work Programme⁶⁸, it appears as though the Commission intends to work towards new legislative instruments, including a review of the fitness of competition law for the digital age, a **Digital Services Act** to reinforce the single market for digital services, and a **revision of the eIDAS Regulation**.

2.2.1 eInvoicing Directive

Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement (**eInvoicing Directive**)⁶⁹, adopted on 16 April 2014, was introduced with the intention of establishing a **European Standard for eInvoicing** in order to streamline various einvoice formats being used throughout the EU and ensure the seamless flow of eInvoices across the EU. In comparison to traditional paper invoices, eInvoices are easier to process, access, and store, therefore, their use represents an important advancement in payment and accounting systems, and a positive development with regards to digital public administration and interoperability. Indeed, through digitalisation, invoicing in the EU has been made quicker, simpler, cheaper and more sustainable through the reduction of printing and postage costs. eInvoicing represents also an opportunity to reduce the workload and the time employed when invoicing public administrations, thus facilitating user-centricity and improving the user experience.

A more specific analysis evaluating the impact of the eInvoicing Directive and assessing whether the intended aims were achieved was conducted in 2019.⁷⁰ Overall, the report found that the impact of the Directive has been largely positive, helping to effectively support the simplification and harmonisation of eInvoicing and related rules across the EU. The Directive has significantly increased the uptake of eInvoices, thus aiding the implementation of public administration and interoperability, however, the report identified an ongoing prevalence of administrative burdens. At present, **21 Member States have deployed an eInvoicing solution for**

68 European Commission, 2020. *Commission Work Programme – A Union that strives for more*.

69 Directive 2014/55/EU of the European Parliament and of the Council on electronic invoicing in public procurement.

70 European Commission, 2019. *Study on the evaluation of invoicing rules of Directive 2006/112/EC*.



business to government purposes, meaning that there is still room for improvement with regards to encouraging the remaining Member States to implement eInvoicing solutions⁷¹. Future revisions to the Directive could help to increase the uptake of eInvoicing solutions and overcome administrative burdens that have been identified since the implementation of the Directive.

2.2.2 eIDAS Regulation

The regulation (EU) N° 910/2014 on electronic identification and trust services for electronic transactions in the internal market (**eIDAS Regulation**)⁷², adopted on 23 July 2014, marks a substantial development with regards to addressing digital public administration and interoperability in the EU. The regulation was introduced with the intention of establishing a predictable regulatory environment to **enable secure and seamless electronic interactions** between businesses, citizens, and public authorities. It ensured that people and businesses can use their own **national electronic identification schemes** (eIDs) to access public services in other EU countries where eIDs are also available. This mechanism has been a step forward for cross border mobility and interoperability because it gave eIDs the same legal status as traditional paper-based ones. By focusing on the user and businesses, the eIDAS Regulation gradually permits a better user experience, with an easier service and product delivery, paving the way towards a European internal market for electronic trust services.

Indeed, in the last six years, the eIDAS Regulation has had a lasting, widespread impact on digital public administration and interoperability in the European Union. The mere provision of common definition of “electronic identification” and “electronic authentication” has aided the implementation of digital public administration and interoperability by providing clarity to public administrations across the European Union. With regards to whether the desired impact has been made, as of Q4 of 2019, **12 countries have notified the Commission of the eID scheme, 27 countries are using the eIDAS reference implementation, and 24 countries have deployed eIDAS-Nodes** that passed the interoperability readiness test. In order to evaluate whether the intended impact of the eIDAS Regulation was achieved, the European Commission is set to public a Report on the Application of the eIDAS Regulation before 1 July 2020. This report will assess to what extent the eIDAS framework remains fit for purpose delivering the intended outcomes, results and impacts, and may identify areas for improvement.⁷³ Furthermore, the European Commission intends to revise the eIDAS Regulation by the end of 2020 in order to improve its effectiveness, broaden its scope to include the

71 Further information available at: <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eInvoicing+dashboard>

72 Regulation (EU) No 910/2014 of the European Parliament and of the Council on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.

73 European Commission, 2019. *Report on the Application of the eIDAS Regulation*.



private sector, and generally promote trusted digital identities across the European Union.⁷⁴ This revision, combined with lessons learned from the evaluation in the upcoming report, will help with the intended goals of the Regulation and with the implementation of digital public administration and interoperability more broadly.

2.2.3 Regulation on the Single Digital Gateway

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 1024/2012⁷⁵ aims to address fragmentation and information gaps in public administrations by completing, improving, and linking up relevant EU and national-level online information, assistance services, and procedures in a user-friendly way. Should the Single Digital Gateway (SDG) be executed in full, it will represent a substantial development in digital public administration and interoperability. The regulation is intended to provide businesses and citizens with high quality, comprehensive information, effective assistance, problem-solving services and compliance procedures, and enable public administrations to aid citizens with any query that they may have with regards to **cross-border activities**. Furthermore, the regulation introduces the **once-only principle for cross-border transactions**, meaning that citizens and businesses will not have to provide data more than once to public administrations in the EU.

The implementation of the SDG follows a phased approach that begins on the 12th of December 2020 and ends on the 12th of December 2023, in light of obligations to support the use of the Once Only Principle. By the 12th of June 2021, the Commission will adopt the implementing acts to set out the technical and operational specifications of the technical system necessary for the implementation of the SDG. At present, the European Commission is working in several work packages with the Member States to discuss various topics that are fundamental for the implementation of the Once Only Principle obligations of the SDG Regulation, in order to define the implementing act foreseen in the Regulation. Thus far, a single digital gateway portal under the title of **“Your Europe”** was launched in June 2018 in 23 official EU languages, marking a substantial development with regards to this regulation.⁷⁶ However, it remains to be seen to what extent the Your Europe platform is helping to achieve the intended goals of the regulation, given that a formal evaluation has yet to be conducted. Furthermore, the provision of the platform in all official EU languages would aid its user-centricity, ensuring that all EU citizens can access the platform in their preferred language. In order to examine the extent to which the objectives of the SDG were met, a full monitoring and evaluation of the regulation is expected in 2022.⁷⁷

2.2.4 Regulation on a framework for the Free Flow of Non-Personal Data in the EU

Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the **free flow of non-personal data** in the European Union⁷⁸ was adopted with the aim of achieving a competitive and integrated EU market for data storage and/or processing services and activities. The Regulation has widespread implications for the implementation and promotion of digital public administration and interoperability, and it represents a key development in this policy domain. The free flow of non-personal data, defined as unrestricted movement of data across borders and IT systems in the EU, is a key building block of the Digital Single Market and considered the most important factor for the data economy to deploy its full potential. The measures in this Regulation are in line with existing rules for the free movement and portability of personal data in the EU. The Regulation, applicable as of 28 May 2019, aims at **removing obstacles to the free movement of non-personal data** across Member States and IT systems in Europe in order to enhance interoperability and cross-border services. With regards to digital public administration and interoperability, the regulation has helped to pave the way for increased security, interoperability and efficiency in data sharing across the EU, and more specifically among public administrations.

When examining the extent to which the Framework for the Free Flow of Non-Personal Data in the EU achieves its intended objectives, it is difficult to comment given the ongoing nature of the regulation. It is hoped that there will be broadly positive impacts on economic development by enhancing the European Data Economy and fostering competition with regards to data storage and data processing services in the European Union.⁷⁹ It is likely that, following close cooperation with Member States and after obtaining the relevant data from them, a comprehensive evaluation will take place in 2024, five years on from the regulation's application.

74 European Commission, 2020. *Shaping Europe's Digital Future*.

75 Regulation (EU) 2018/1724 of the European Parliament and of the Council 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.

76 Further information available at: <https://europa.eu/youreurope/index.htm#>

77 European Commission, 2017. *Commission Staff Working Document: Proposal for a regulation of the European Parliament and of the Council on establishing a single digital gateway to provide information, procedures, assistance and problem-solving services and amending Regulation (EU) No 1024/2012*.

78 Regulation (EU) 2018/1807 of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union.

79 European Commission, 2017. *Commission Staff Working Document: Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union*.

2.2.5 Open Data Directive

The Directive on open data and the re-use of public sector information, also known as the ‘**Open Data Directive**’ (Directive (EU) 2019/1024) entered into force on 16 July 2019. It replaces the Public Sector Information Directive, also known as the ‘PSI Directive’ (Directive 2003/98/EC) which dated from 2003 and was subsequently amended by the Directive 2013/37/EU. Directive 2003/98/EC on the re-use of public sector information set out a framework for the conditions of its reuse and aimed to ensure equal treatment for commercial editors within the internal market. Public sector organisations authorising this type of reuse continued to hold copyright and related rights. They were, however, invited to **exercise their copyrights in a way that facilitated re-use**. However, the Directive did not seek to define or to change access regimes in Member States, which remain their responsibility. Directive 2013/37/EU extended the scope of Directive 2003/98/EC to libraries, including university libraries, museums and archives.

The main changes following the adoption of the Open Data Directive include the obligation to publish high-value geospatial, meteorological, statistics, mobility, companies and company ownership, and earth observation and environment datasets; reinforced transparency and limiting the conclusion of private sector agreements which could lead to exclusive re-use of public sector data by private partners; the requirement for Member States to develop policies for open access to publicly funded research data while harmonised rules on re-use will be applied to all publicly-funded research data which is made accessible via repositories; and data transparency from public undertakings in the transport and utilities sector. **Open data is key** to ensure the efficacy of digitisation of public administrations as it creates interoperable data frameworks that are easily accessible for users and re-usable at different administrative layers. It is hoped that Directive will help promote all data generated by public administrations that is in principle freely available for re-use, except in very limited cases, thus stimulating the transparency, non-discrimination and non-exclusivity of data. Furthermore, the Directive aims to ensure that public administrations make their own data freely available for use, particularly by SMEs, civil society, and the scientific community.

When examining the extent to which the Open Data Directive achieves its intended objectives, it is difficult to comment given the ongoing nature of the regulation. It is hoped that concerns identified in an impact assessment of its predecessor, the PSI Directive, will be fully addressed during implementation, namely; (1) insufficient transparency, (2) scope of the Directive, (3) high and anti-competitive charges, (4) implementation and application and (5) cumbersome and lengthy redress proceedings.⁸⁰ The European Commission has confirmed that a full evaluation of the Directive will be completed in July 2025, focussing particularly on the extent of the increase in re-use of public sector documents, the impact of high-value datasets, the use of API's, and further possibilities for improvement, among others.⁸¹

2.3 Most recent European Commission funding programmes supporting digital public administration and interoperability throughout Europe

While there have been several broad-spectrum funding programmes from the European Commission that have contributed in some way to digital public administration and interoperability, these were not their main priorities. The **ISA² Programme** is the only funding programme focussed entirely on interoperability, with the aim of enhancing the implementation of digital public administration and interoperability. Going forward, the European Commission intends to introduce the renewed **Connecting Europe Facility** and an entirely new programme focussed on building the strategic digital capacities of the EU, the **Digital Europe Programme**. With a foreseen proposed budget of EUR 9.2 billion, to be approved by co-legislators, the provision of this funding programme highlights the Commission's prioritisation of digital public administration and interoperability in the coming years.

Additional funding programmes contributing to the implementation of digital public administration and interoperability but whose main focus is not this policy domain include:

- **Horizon 2020**⁸² primarily focuses on science, industrial leadership and societal challenges, however, it has funded projects for designing innovative solutions for public administrations and creating a modern, ICT-enabled public sector.
- The **European Structural and Investment Fund**⁸³ provide funding for research and innovation, digital technologies, low-carbon economy, sustainable management of natural resources and small businesses. An important part of this fund (21.4 billion) has been made available for ICT investments between 2014 and 2020 to benefit eGovernment services, digital public administration, and interoperability.

⁸⁰ Further information available at: <https://ec.europa.eu/digital-single-market/en/european-legislation-reuse-public-sector-information>

⁸¹ Directive (EU) 2019/1024 of the European Parliament and of the Council on open data and the re-use of public sector information.

⁸² Further information available at: <https://ec.europa.eu/programmes/horizon2020/en>

⁸³ Further information available at: https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds_en

- The **Structural Reform Support Programme**⁸⁴ provides financial assistance to Member States seeking to implement growth-enhancing institutional, structural and administrative reforms. Many projects funded by this programme were focused on digitisation and interoperability.

2.3.1 The ISA² Programme

The **ISA² Programme: Interoperability Solutions for European Public Administrations, Businesses and Citizens**⁸⁵, is a fund supporting the development of digitisation for public administrations, citizens and businesses. ISA² covers the period 2016-2020 with a financial package of EUR 131 million. This programme was intended to support the **development of interoperable digital solutions** available to all interested public administrations in Europe. However, contrary to its predecessor, the ISA Programme, ISA² intended to be broader in scope, with a **focus on experimentation and the use of innovative technologies** by the public sector, such as Distributed Ledger Technologies, AI, Internet of Things, and Application Programme Interfaces, among others⁸⁶. Not only do these technologies bring efficiencies, but they also facilitate the creation of more user-centric public services, thus bringing a social dimension to the programme by transforming the interactions between citizens and their public administrations. Furthermore, the European Parliament recommended that the Commission should monitor the impact of the programme on the modernisation of the public sector and digital public administration, and to ensure that best practices and guidelines are developed for the use of the various solutions.

In the last four years, the ISA² programme has had a lasting, widespread impact on digital public administration and interoperability in the European Union, seeking to address the needs for improvements to digital public administration and interoperability by **facilitating data reuse and data sharing**. In March 2017, the Commission adopted a new Communication on interoperability (COM/2017/0134), which introduced the revised European Interoperability Framework (EIF) and an interoperability Action Plan (IAP) to guide the implementation of the EIF. In light of Article 3 of the legal basis of the ISA² programme, the Commission governed and coordinated the implementation of the EIF and accompanying IAP through the ISA² programme, using key performance indicators and measurable targets.

The interim evaluation of the ISA² programme in 2019 confirmed that, three years on from its inception, the objectives of the programme are still highly relevant, particularly in light of ever-evolving needs in the domains of digital public administration and interoperability.⁸⁷ ISA² plays a crucial role in enhancing the interoperability landscape in the European Union, however, some measures could help to improve the performance of the programme, such as: raising awareness beyond national administrations by explaining the benefits of (re)using the ISA² interoperability solutions to regional and local administrations; placing more emphasis on sharing best practices; acting upon the synergies created between ISA² and other EU programmes to promote interoperability; and improving the quality of existing solutions by better considering user needs.

In terms of the long-term sustainability of interoperability results, efforts should be made to build up skills and advisory capabilities around interoperability and conduct an in-depth assessment of the rationale and impacts of a possible binding interoperability framework.

2.3.2 Connecting Europe Facility

The **Connecting Europe Facility** (CEF)⁸⁸ is a central EU funding instrument to promote growth, jobs and competitiveness via specific infrastructure investments. This programme was intended to foster the development of efficient, sustainable and interconnected trans-European networks in three core policy domains; **transport, energy and digital services**. With regards to digital services, one of the programme's core objectives was the development and implementation of **EU-wide data and digital service infrastructure** to support digitisation in key areas of public interest, such as public administrations, by generating more cross-border interaction and improving public services. A helpful feature of the CEF programme is the dedicated dashboards which provide information about the uptake, service availability and financial management of CEF initiatives, thus allowing users to track the state-of-play of the programme.⁸⁹

84 Further information available at: https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/structural-reform-support-programme-srsp_en

85 Further information available at: https://ec.europa.eu/isa2/home_en

86 For example, CEF Building Block such as European Blockchain Service Infrastructure (EBSI) and Big Data Test Infrastructure (BDTI) were piloted within ISA² initially.

87 European Commission, 2019. *Evaluation study supporting the interim evaluation of the programme on interoperability solutions for European public administrations, businesses and citizens*.

88 Further information available at: <https://ec.europa.eu/inea/en/connecting-europe-facility>

89 Further information available at: <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Dashboards>

Since 2014, the CEF programme has had a strong impact on digital public administration and interoperability in the European Union. To track the state-of-play of various initiatives of the CEF Programme, there are dedicated dashboards providing information about their uptake, service availability and financial management.⁹⁰ Overall, an interim report from 2018 found that the CEF has generally brought added value for public administrations by supporting online connectivity projects with cross-border elements, including projects addressing how to respond to cyber threats, streamlined invoicing procedures, cooperation mechanisms, validated eIdentifications and eSignatures, and improved access to national procurement procedures.⁹¹ A thorough evaluation of the programme will only be possible when the programme has been completed, however, the Commission's decision to propose a renewed CEF as part of the next long-term EU budget is a promising development, highlighting the Commission's faith in the CEF programme in implementing digital public administration and interoperability within the scope of the telecommunications-related goals of the programme. The renewed CEF, also referred to as CEF2, has the objective of contributing to the development of projects of common interest and projects dedicated to innovative technologies, including increased access to 5G systems, the provision of high-quality, free wireless connectivity, Blockchain, and significant upgrades to existing networks, among others.⁹²

2.3.3 Digital Europe Programme

As part of the Multiannual EU Financial Framework, the Commission announced a proposal for **the Digital Europe Programme**⁹³ focusing on building the strategic digital capacities of the EU, with an emphasis on the deployment capacity of digital technologies for business and citizens across Europe. The budget amounts to 9.2 billion euros and would help to **harness the development and financing of cut-edging technology** such as supercomputing (quantum technology), artificial intelligence, cybersecurity, and e-learning. Its main objective is to ensure a wide use of these technologies while enhancing EU's competitiveness in this realm. With regards to digital public administration and interoperability, the programme is intended to ensure that public administrations can use digital technologies, gain access to testing platforms, trial pilots of digital technologies, and generally overcome interoperability issues that continue to persist in the EU, with the help of EUR 1.3 billion in funding. It is expected that the programme will complement the objectives of other funding programmes, such as the CEF and Horizon Europe.⁹⁴

Given that the programme is not due to start until 1st January 2021, depending on the outcome of the Multiannual Financial Framework and budgetary negotiations among the Member States, it is not yet possible to evaluate its impact on the implementation of digital public administration and interoperability. However, the Commission has outlined a variety of instruments and impact indicators to help measure the impact of the programme as compared to the intended impact.⁹⁵ Many existing indicators from the Digital Economy and Society Index (DESI) are still relevant, however some new indicators will need to be developed for more detailed analyses of the impact of DEP. The overall success of the programme with regards to implementing digital public administration and interoperability will be evaluated with a series of quantitative key performance indicators, including the number of interoperable cross border digital public services delivered across all areas of public sector responsibility, the number of digital services delivered, and the take-up of digital services in public administrations, among others. For the interoperability strand, the key performance indicators from the Monitoring Mechanism of the EIF will be reused.

2.4 Juncker's legacy and von der Leyen's ambition: fostering further digital public administration and interoperability throughout Europe in 2019-2024

Between 2014 and 2019, the Juncker Commission made a strong commitment to the digital transition of the European Union, with a particular focus on digital public administration and interoperability. The adoption of the Digital Single Market (DSM) strategy, the General Data Protection Regulation (GDPR), and numerable political and legislative initiatives specifically targeting eGovernment and interoperability are just some of the Juncker Commission's achievements in this policy domain. While still in its early days, the von der Leyen Commission has demonstrated its intent to **pursue this legacy**, building off former achievements and incorporating additional cutting-edge innovations, particularly with regards to emerging technologies. A reinforced commitment to developing and regulating Artificial Intelligence, 5G, Blockchain, and quantum computing, and foreseen revision of competition laws to prevent unfairness highlight von der Leyen's intent to ensure that the European Union is at the forefront of the global push for digital transformation.

90 Further information available at: <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Dashboards>

91 European Commission, 2018. *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the mid-term evaluation of the Connecting Europe Facility (CEF)*.

92 European Commission, 2019. *Non-paper on the draft orientations towards an implementation roadmap – Connecting Europe Facility (CEF2) Digital*.

93 Further information available at: <https://ec.europa.eu/digital-single-market/en/news/digital-europe-programme-proposed-eu92-billion-funding-2021-2027>

94 Further information available at: <https://www.europarl.europa.eu/legislative-train/theme-a-europe-fit-for-the-digital-age/file-mff-digital-europe-programme/04-2020>

95 European Commission, 2018. *Commission Staff Working Document: Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027*.

One key evolution of the von der Leyen Commission is its focus on a “**twin transition**”. Indeed, rather than keeping environmental initiatives and eGovernment and interoperability initiatives largely separate from one another, the von der Leyen Commission intends to **merge the ecological and digital transition** of the European Union in such a way as to ensure that both transitions complement one another. In practice, this means ensuring that **digital advancements are ecologically sound** and will have limited environmental impact, and that digital and emerging technologies are used to help the Commission achieve its ambitious environmental goals, such as a European Green Deal and climate neutrality. The von der Leyen Commission further applies digitalisation to other policy domains, with the hope of weaving digital and emerging technologies into specific sectors like health and finance.

While it is early days yet, an initial analysis of the priorities of the von der Leyen Commission highlights strong synergies with those of its predecessor. It seems that the new Commission fully intends to continue the Juncker Commission’s legacy of acting as a driving force to support digital public administration and interoperability in Europe, evolving slightly to include a multi-pronged approach to further strengthen the importance of digitalisation in other policy domains and ensure that the European Union is at the fore of digital progression.

2.4.1 *A deeper and more digital single market*

Indeed, in the wake of the COVID-19 pandemic, the European Commission presented an **EU Recovery Plan** on the 27th of May 2020 to be discussed with the Member States. The impact of the pandemic on the global economy and on citizens’ lives has highlighted the importance of digitisation across all areas of the EU economy and society. It is new technologies that have kept businesses and public services functioning and ensured that trade across the EU has continued to flow freely in times of deep economic uncertainty. These new technologies have also helped to keep citizens connected with one another, to work remotely, and to support the continued education of young people. While the full impact of this pandemic remains to be seen, it is likely that permanent structural changes in our society and economy will be triggered, including the increased prevalence of teleworking, eLearning, eCommerce, and eGovernment. This shift highlights the need for and potential of common digital public services, such as universally accepted eIDs to allow for simple, trusted and secure access to cross-border digital public services. In these times of turmoil, it is hoped that the pandemic will positively influence digital public administration and interoperability by spurring the need to improve digital public services across the European Union. The Interoperability Unit D2 - ISA² within the Directorate General for Informatics (DIGIT) launched its own response to COVID-19 – an online repository of digital solutions hosted on Joinup. **Digital Response to COVID-19**⁹⁶ gives users access to a large resource database including open source software, websites, and platforms that are useful for public administrations, businesses, and citizens dealing with the ongoing crisis. This development marks a step in the right direction with regards to boosting the resilience of public administrations and improving digital public administration and interoperability.



96 Further information available at: <https://joinup.ec.europa.eu/collection/digital-response-covid-19>



03

Implementation of the EIF by the European Countries



3. | Implementation of the EIF by the European countries

The objective of this chapter is to present the European Interoperability Framework (EIF) Monitoring Mechanism. It will focus on the Monitoring Mechanism's measurement of the progress made over time by the 36 European countries included in the sample for this study⁹⁷ (henceforth referred to as "European countries") in implementing the EIF. More specifically, the chapter will first introduce the context and background of the EIF Monitoring Mechanism. Second, it will illustrate the consolidated results, at the European level, of the 2019 exercise measuring the implementation of the EIF. Finally, the chapter will highlight the main challenges that European countries are facing when implementing the EIF and will outline best practices in fostering interoperability based on the experiences of three countries.

3.1 Context and background of the Monitoring Mechanism for European countries

3.1.1 Introduction to the EIF and its Monitoring Mechanisms

Since the launch of the Digital Single Market Strategy⁹⁸ in 2015, several European initiatives promoting the modernisation of public administrations have been adopted at the European, national and sub-national levels. Under the umbrella of the Digital Single Market Strategy and the ISA² programme⁹⁹, in March 2017, the European Commission adopted a new Communication on Interoperability¹⁰⁰. This communication introduced a revised European Interoperability Framework (EIF)¹⁰¹, accompanied by the Interoperability Action Plan (IAP)¹⁰², which should support the implementation of the EIF until 2020. The EIF provides guidance to public administrations on how to improve the governance of their interoperability activities, establish inter-organisational relationships and ensure the streamlining of processes supporting digital services. The EIF provides 47 recommendations, organised in three pillars:

- a) The first pillar comprises the **12 principles** that should guide policy makers in the pursuit of interoperability: Subsidiarity and proportionality, Openness, Transparency, Reusability, Technological neutrality and data portability, User-centricity, Inclusion and accessibility, Security and privacy, Multilingualism, Administrative simplification, Preservation of information, and Assessment of effectiveness and efficiency.
- b) The second pillar describes the **interoperability layers**, presenting different aspects of interoperability that should be addressed in the design of European public services: Legal, Organisational, Semantic and Technical. These four layers share a cross-cutting component regarding the integrated public service governance, and a background layer on interoperability governance.
- c) The third pillar proposes the **conceptual model** for designing and delivering integrated public services. It fosters the idea of 'interoperability by design' as a standard approach driven by reusability. In this regard, European public services should reuse both internal and external information sources.

It is worth mentioning that the implementation of the EIF contributes to the achievement of important initiatives such as the Digital Single Market Strategy¹⁰³, the eGovernment Action Plan¹⁰⁴, and the Tallinn Ministerial Declaration on eGovernment¹⁰⁵. Finally, the implementation of the EIF in European countries, and more specifically in the 27 EU Member States, will also contribute to the priorities of the upcoming Digital Europe Programme¹⁰⁶. This is particularly true for "Objective 5: on deployment, best use of digital capacity and interoperability" of the Digital Europe Programme.

97 The countries studied are the 27 EU Member States and the United Kingdom, the members of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland) as well as Ukraine, Montenegro, Turkey and the Republic of North Macedonia.

98 European Commission, 2015. *A Digital Single Market Strategy for Europe*.

99 European Commission, 2017. *ISA² Programme: Communication strategy and stakeholders' engagement plan*.

100 European Commission 2017. *The European Interoperability Framework- Implementation Strategy COM (2017) 134 Annex II*.

101 European Commission 2017. *The New European Interoperability Framework*.

102 European Commission 2017. *The European Interoperability Framework- Implementation Strategy COM (2017) 134 Annex I*.

103 European Commission, 2015. *A Digital Single Market Strategy for Europe*.

104 European Commission 2016. *eGovernment Action Plan 2016-2020 - Accelerating the digital transformation of government COM (2016) 179 final*.

105 European Commission 2017. *Tallinn Declaration on eGovernment at the ministerial meeting during Estonian Presidency of the Council of the EU on 6 October 2017*.

106 European Parliament, 2018. *Digital Europe programme for the period 2021-2027 COM (2018) 434 final - 2018/0227 (COD)*.

In order to fulfil the ISA² programme's obligation¹⁰⁷ to monitor the implementation of the EIF, the European Commission has created an integrated framework for monitoring, evaluating and reporting on the implementation of EIF within the European Countries. These activities are carried out within the remit of the National Interoperability Framework Observatory¹⁰⁸ (NIFO) under the ISA² Programme.

3.1.2 Development of the EIF Monitoring Mechanism

In order to ensure that the EIF recommendations are implemented across European public administrations and that key objectives of the EIF are reached, it is important to monitor the level of implementation of the EIF and publish findings. The EIF Monitoring Mechanism helps European countries to identify the areas in which their performance could be improved, as well as the areas in which they are performing well. The remainder of this subsection will outline the methodology and approach used to design the EIF Monitoring Mechanism.

The measurement of the implementation of the EIF consists of monitoring the level of implementation of the 47 EIF recommendations. To this end, the European Commission put in place the EIF Monitoring Mechanism, designing a set of meaningful and measurable KPIs to assess the 47 EIF recommendations. The development of the EIF Monitoring Mechanism involved several stakeholder consultations with the European Commission and representatives of the European countries, with the aim of fine-tuning the KPIs. As part of the stakeholder consultations, pilot studies in Bulgaria, Luxembourg and Spain were carried out to test the feasibility of the data collection exercise and refine the definition and structure of the KPIs. As a result of this process, the EIF Monitoring Mechanism is composed of 68 KPIs which are fed by both primary and secondary data sources. Primary data is collected on an annual basis through an online survey addressed to country representatives. The secondary data includes relevant data that is gathered from other official sources of the institutions of the EU (e.g. European Data Portal¹⁰⁹, eGovernment Benchmark 2019¹¹⁰, DESI Index¹¹¹, and Eurostat¹¹²).

Following the finalisation of the EIF Monitoring Mechanism, a baseline data collection was carried out in all the European countries in 2019 to test the robustness of the mechanism. Based on the results of this data collection and the guidance provided by the European Commission's Joint Research Centre – Competence Centre on Composite Indicators and Scoreboards (JRC-COIN), the EIF Monitoring Mechanism was further refined and the most relevant visualisation methodology to display the results of the EIF Monitoring Mechanism was selected.

3.1.3 Measurement of the EIF implementation in European countries

As described in subsection 3.1.1, the EIF is organised in three pillars, which are divided into 25 thematic areas, each of which are related at least one EIF recommendation. Figure 9 shows the conceptual model of the EIF Monitoring Mechanism composed of three scoreboards to represent each pillar, depicting the 25 thematic areas grouping the 47 EIF recommendations.

107 The ISA² programme's obligation on monitoring the EIF implementation refers only to the EU Member States, however, the scope of the monitoring exercise has been extended to 36 countries including the United Kingdom, the members of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland) as well as Ukraine, Montenegro, Turkey and the Republic of North Macedonia.

108 Further information available at: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory>

109 European Data Portal, 2019. *Open data in Europe*.

110 Commission DG Communications Networks, 2019. *eGovernment Benchmark 2019: Empowering Europeans through trusted digital public services*.

111 European Commission, 2019. *DESI Index*.

112 Eurostat, 2019. *eGovernment activities of individuals via websites*.



Figure 9 EIF Monitoring mechanism conceptual model

Interoperability Principles												Interoperability Layers				Conceptual Model for Integrated Public Services Provision								
Principle 1	Principle 2	Principle 3	Principle 4	Principle 5	Principle 6	Principle 7	Principle 8	Principle 9	Principle 10	Principle 11	Principle 12	Interoperability governance	Integrated Public Service Governance	Legal Interoperability	Organisational Interoperability	Semantic Interoperability	Technical Interoperability	General	Internal information sources and services	Basic Registries	Open Data	Catalogues	External information sources and services	Security and Privacy
1	2-4	5	6-7	8-9	10-13	14	15	16	17	18	19	20-24	25-26	27	28-29	30-32	33	34-35	36	37-40	41-43	44	45	46-47
1	2-7	8	4; 09-18	19-20	21-27	28	29	30-33	34-37	38	39	40-45	46-47	48	49-50	12; 51-53	7	54-55	56	26; 51; 57-61	3; 12; 62-65	42	66	67-68

Scoreboard
 Thematic area
 Recommendation
 KPI

Source: analysis performed by Wavestone.

From the viewpoint of the data aggregation, the conceptual model of the EIF Monitoring Mechanism aggregates the data of one or more KPIs to measure the implementation of one recommendation, while one or more recommendations are used to measure the level of implementation of a thematic area.

Thus, the conceptual model makes it possible to filter the results of the EIF monitoring exercise by different levels of granularity, such as by KPI, recommendation, and thematic area.

3.2 The 2019 results of the EIF implementation

This section presents the consolidated results of the 2019 exercise measuring the EIF implementation at the European level. The scoring for each thematic area was calculated based only on the average scoring of the 27 EU Member States, rather than the 36 European countries included in the sample for this report.¹¹³ An analysis of the EIF implementation performance at the individual country level is available in the various Digital Public Administration Factsheets of 2020.

The three graphs presented below in Figure 10, Figure 11 and Figure 12 show the average performance of the 27 EU Member States at the thematic area level in 2019. The graphs show the level of implementation of each thematic area on a scale of one to four, where one indicates a low level of implementation and four indicates a high level of implementation. A more detailed description of the main challenges faced by the European countries is presented within section 3.3.1.

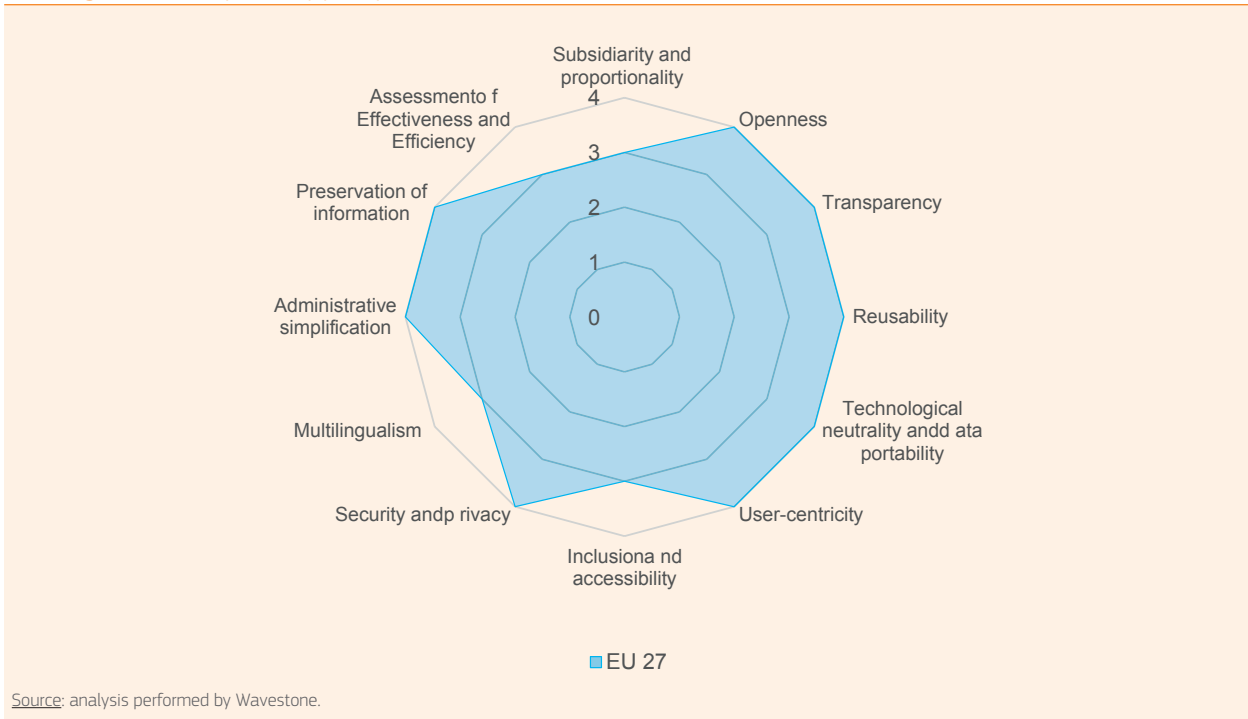
1) Implementation level of the interoperability principles

Figure 10 presents the 2019 results of the monitoring of the EIF implementation for the **Interoperability principles pillar**.

¹¹³ The EIF Monitoring Mechanism data collection was launched in November 2019 and terminated in February 2020. In the EU27, France did not participate in the data collection exercise.



Figure 10 Interoperability principles



The results show that there are potential areas for improvement regarding the interoperability principles of subsidiarity and proportionality (Principle 1), inclusion and accessibility (Principle 7), multilingualism (Principle 9) and assessment of effectiveness and efficiency (Principle 12).

Despite the lower scores attributed to these four principles, overall, the EU Member States are achieving high performance in terms of the level of implementation of interoperability principles.

2) Implementation level of the interoperability layers

Figure 11 presents the 2019 results of the monitoring of the EIF implementation for the **Interoperability layers pillar**.



Figure 11 Interoperability Layers



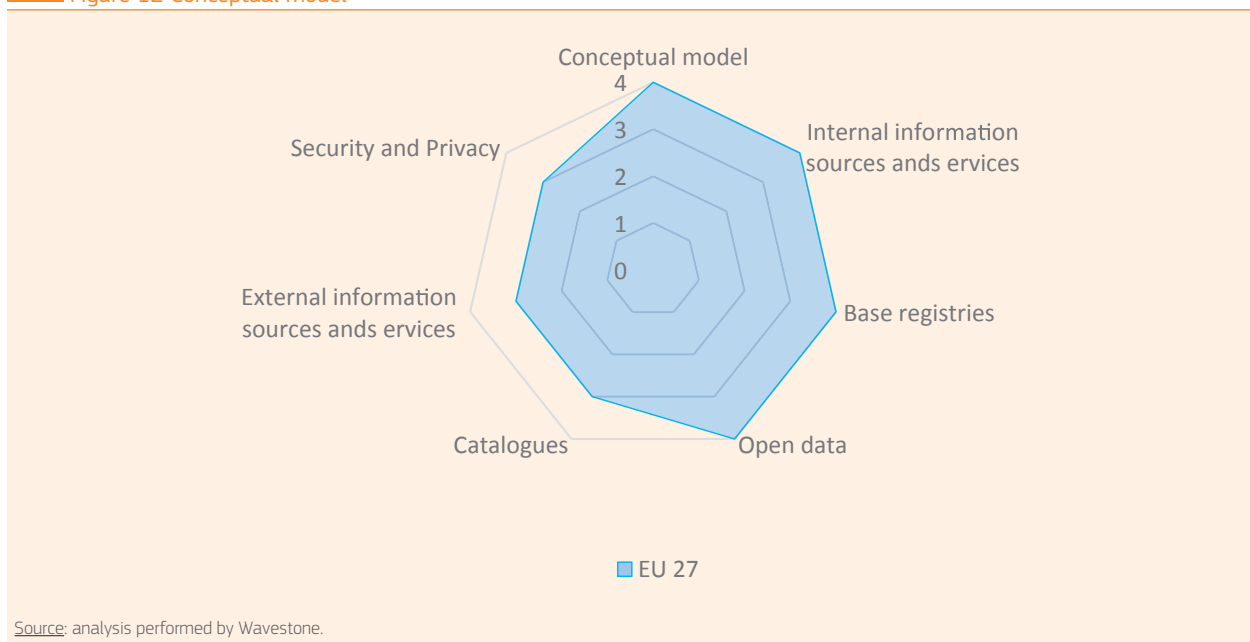
The results indicate that the only interoperability layer not scoring maximum points, and thus representing an opportunity for improvement, is interoperability governance. The EIF addresses two aspects for the achievement of interoperability governance, namely (i) the implementation of holistic governance of interoperability activities across administrative levels and sectors; and (ii) the identification and selection of common standards and specifications to facilitate interoperability.

3) Implementation level of the Conceptual model

Figure 12 depicts the 2019 results of the monitoring of the EIF implementation for the **Conceptual model pillar**.



Figure 12 Conceptual model



The results show that, overall, the EU Member States are achieving a high level of performance in implementing the recommendations related to the EIF Conceptual model. However, the thematic areas of ‘security and privacy’, ‘external information sources and services’ and ‘catalogues’ have scored lower than the maximum score and therefore, they represent potential areas for improvement for the EU Member States.

3.3 Perspectives on key challenges and best practices in Europe

After providing an overview of the 2019 results of the monitoring of the EIF implementation, this section investigates the main challenges and best practices in the implementation of the EIF in European countries.

3.3.1 Key challenges to interoperability in Europe

This subsection highlights the areas in which European countries have faced key challenges in implementing the EIF. To identify these challenges, the thematic areas scoring the lowest at the European level (highlighted in Section 3.2) were analysed. The key challenges for the implementation of the EIF’s thematic areas, underlying recommendations and KPIs are presented in the remainder of this subsection.

1) Implementation of the interoperability principle of subsidiarity and proportionality

The lower score given to the interoperability principle of subsidiarity and proportionality shows that this principle has not yet been fully implemented in European countries. The current national strategies or frameworks in place, or those in the process of being published, are indeed not taking all of the 47 EIF recommendations and their 12 principles into account. Recommendation 1 of the EIF states that European countries should “ensure that national interoperability frameworks and interoperability strategies are aligned with the EIF and, if needed, tailor and extend them to address the national context and needs”.

Some European Countries only partially take into account the 47 recommendations and 12 principles of the EIF in their current NIF. However, some European countries are revising their NIF, related strategies and frameworks and making other adjustments to align them with the EIF.

By way of example, Spain has put in place a specific methodology to assess the compliance of their National Interoperability Framework (ENI) with the EIF to ensure the implementation of its recommendations and principles. Further information is detailed in section 3.3.2 (2).

2) Implementation of the interoperability principle of inclusion and accessibility

The results of the EIF Monitoring Mechanism show that the interoperability principle of inclusion and accessibility has still not been fully achieved in European countries. Despite the proliferation of new technologies on the market and the fact that European countries were mandated to implement legislation in order to comply with the Directive (EU) 2016/2102¹¹⁴ on the accessibility of the website, the potential of new technologies is not yet being fully exploited to enable users to access and use European public services. Additionally, not all public services ensure accessibility to people with disabilities, the elderly and other disadvantaged groups. The implementation of the inclusion and accessibility principle should be part of the whole development lifecycle of European public services and these services should meet the requirements set by the e-Accessibility specifications widely recognised at the international and European level.

By way of example, not all the public sector eGovernment portals of the European countries published before 23 September 2018 are fully compliant with the Directive (EU) 2016/2102 on the accessibility of the website and mobile applications of public sector bodies.

In the United Kingdom, the Directive came into force on 23 September 2018. All UK public sector websites and mobile applications meet the accessibility standards and have a statement detailing the levels of accessibility.

In Liechtenstein, the LLV portal¹¹⁵ is the central national eGovernment portal. The portal now has a new responsive design with a focus on usability, which also allows for mobile-friendly access. The most visited content is automatically presented at the top of the Index page and the content is unified across all agencies. A new search function now presents data in groups, thus drastically reducing the time needed to access necessary information. With this new user-driven suggestion system and a very fast implementation cycle, the portal has become a flexible and living platform. The platform offers a wide range of online applications and services related to living in Liechtenstein.

3) Implementation of the interoperability principle of multilingualism

European countries are still encountering difficulties in implementing the interoperability principle of multilingualism. Improvements should be made to ensure that public administrations provide users with instructions for completing procedures in official EU languages other than the national language of the respective countries. When designing new public services, European countries should ensure that the number of languages available is determined on the basis of user needs, the level at which the service is essential for the implementation of the digital single market or national policies, and the size of the audience concerned. One of the KPIs through which the EIF Monitoring Mechanism measures the implementation of this principle is the extent to which users of each of the 21 proposed procedures across the 7 life events of the Single Digital Gateway¹¹⁶ initiative are able to access instructions for completing the procedure in an official EU language broadly understood by the largest possible number of cross-border users. The results of this KPI

¹¹⁴ Directive (EU) 2016/2102 of the European Parliament and of the Council on the accessibility of websites and mobile applications of public sector bodies.

¹¹⁵ Further information available at: <https://www.llv.li/inhalt/117214/amtsstellen/business-in-liechtenstein-english-version>

¹¹⁶ Regulation (EU) 2018/1724 of the European Parliament and of the Council 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.





are heterogeneous and some procedures are not always available in an official EU language other than the national language of the country concerned.

In Latvia, the national public administration language technology platform Hugo.lv was launched in 2018 using world-renowned artificial intelligence-based machine translation systems, speech recognition tools and the National Term Database. The service provides automatic translation from Latvian into English and vice versa, as well as from Latvian into Russian, so that users can translate texts, documents, and websites, thus enabling multilingualism in the government eServices. The services provided through the platform are customised for the Latvian language and adapted specifically to public sector documents. This helps to provide a much higher quality of translation than generic online translation systems.

4) Implementation of the interoperability principle of assessment of effectiveness and efficiency

Public administrations in European countries are still struggling to assess the efficiency and effectiveness of interoperability solutions. The EIF recommends that “public administrations should evaluate the effectiveness and efficiency of different interoperability solutions and technological options considering user needs, proportionality and balance between costs and benefits”¹¹⁷. Therefore, it is important that public administrations assess the effectiveness and efficiency of interoperability solutions by tackling concerns such as the return on investment, total cost of ownership, reusability, adaptability, risks, administrative burden, simplification of administrative processes, user satisfaction and user-centricity. The technological solutions used to design a new public service should be evaluated to ensure the effectiveness and efficiency of the services designed.

It appears in the results of the implementation of the EIF that some elements are somewhat evaluated by European countries to assess the efficiency and effectiveness of interoperability solutions. In particular, the adaptability and return on investment of the solutions are poorly assessed in most cases. The elements that are most evaluated by the European countries are reusability, total cost of ownership and the extent to which solutions reduce the administrative burden and simplify administrative processes.

For example, in the Netherlands, one of the main initiatives to ensure the implementation of the EIF has been the development of the Dutch Governmental Reference Architecture (NORA) in order to support the design of European cross-border services. This platform brings together the knowledge of several experts in digital service design, which facilitates the creation of domain-specific architectures. Sharing information ensures efficient cooperation with other service providers and optimal reuse of existing solutions. Services are designed by experts and made available on this platform, thus increasing the return on investment due to the reuse of such services by multiple public administrations. Finally, it reduces costs since several organisations have access to the catalogue of services on the platform and therefore there is no need to design new services. More information is given in section 3.3.2 3).

5) Implementation of an Interoperability governance

The results of the EIF Monitoring Mechanism indicate that the governance of interoperability remains a challenge in Europe and should be strengthened. The EIF interoperability governance recommendations refer to holistic governance as well as identification and selection of standards and specifications. Regarding holistic governance, European countries should continue to work towards promoting interoperability across administrative levels and sectors. Regarding standards and specifications, some European countries are still lagging behind in defining processes for the selection and adoption of standards and specifications. By clearly defining these processes, it is likely that interoperability will be increased. For instance, one KPI used to measure the level of implementation of interoperability governance in European countries is the existence of assessment methods for standards and specifications at the national level and the results show that not all European countries use these methods.

For instance, in the Netherlands, the Standardisation Forum¹¹⁸ has published a list of open standards to ensure the use, development and establishment of open standards for electronic exchanges. In this regard, the Standardisation Forum provides support to the Dutch government.

In Spain, the ENI established the Interoperability Technical Standards which are mandatory for public administration bodies and detail specific aspects of interoperability. In particular, there are twelve Interoperability Technical Standards outlined: catalogue of standards, electronic documents, electronic files, digitisation of documents, electronic signature policies, data intermediation protocols, data models, electronic documents management policy, requirements for the connection to the network of the Spanish public administration, procedures for authentic copies and conversion between formats, data models for the exchange of records between official input/output registries, and reuse of public sector information.

¹¹⁷ Further information available at: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/2-underlying-principles-european-public-services#2.13>

¹¹⁸ Further information available at: <https://www.forumstandaardisatie.nl/english>

In April 2020, a study on Interoperability Solutions for Public Administrations, Businesses and Citizens¹¹⁹, carried out in the framework of the ISA² programme, was made available online. This study provides recommendations to enable public administrations, businesses and citizens in Europe to benefit from interoperable cross-border and cross-sectoral public services. It helps European countries to implement integrated governance of public services and organisational interoperability. In fact, the study aims to guide European countries in the implementation of the Interoperability Action Plan and more specifically to identify and describe governance structures and good practices for interoperability coordination. Finally, it helps European countries to clarify and propose ways to formalise the organisational relationships of public administrations in the context of the development of European public services.

6) Implementation of catalogues of public services, public data and interoperability solutions

Implementing catalogues of public services, open data and interoperability solutions is crucial to foster interoperability. Such catalogues aim to support public administrations in finding reusable resources (e.g. services, data, software, data models). Different types of catalogues exist, such as guidelines, catalogues of standards, open data portals, etc. and they should all provide common descriptions of services, data, registries and solutions to enable interoperability between catalogues. In addition, they should be based on common ICT standards and specifications in order to foster the adoption of reusable resources by public administrations.

When identifying ICT standards and specifications, such as CPSV(-AP), DCAT-AP, ADMS, public administrations should consult specific catalogues. For instance, governments can consult European or National catalogues of ICT standards, the European Interoperability Cartography (EIC), Joinup's catalogue of solutions or catalogues of other European countries.

While responsibility for the provision of these catalogues lies with European public administrations, many are still struggling to do so, particularly on account of problems associated with the harmonisation of standards and specifications. For instance, the results of the implementation of the EIF reveal that, overall, a very small number of European countries consult catalogues of other countries when identifying ICT standards and specifications. Furthermore, the European Interoperability Cartography is also poorly used by public administrations. On the contrary, European and national catalogues of ICT standards are widely used, as well as the Joinup catalogue of solutions. Finally, some European countries also consider international catalogues to validate their identification of ICT standards and specifications.

As a good example, Norway has launched a National Data Catalogue which provides an overview of data sets that have been registered and made available by public agencies, making it both easier to search for public sector data and re-use it, for example, for analytical purposes. In addition to datasets, the catalogue contains APIs, concepts and information models.

Moreover, in the Netherlands, Cooperating Catalogues has been established. This platform is a standard to provide citizens and businesses with a one-stop-shop entry for government products and services, wherever they start searching. Furthermore, it is a standard for publishing and exchanging metadata about such products and services. Information from Cooperating Catalogues is disclosed on the portals overheid.nl and ondernemersplein.nl, as well as on the websites of participating government organisations.

7) Use of external information sources and services by public administrations while developing public services

At present, public organisations are not fully exploiting the potential of external sources of information and services to develop more interoperable public services in Europe. The EIF identifies the following external information sources and services that could be leveraged when developing European public services to increase their interoperability: payment services provided by financial institutions, connectivity services provided by telecommunications providers, open data, data from other organisations, Internet of Things sources, and social media applications. According to the results of the monitoring of the EIF implementation, there is a need to improve the extent to which European public administrations exploit external information sources and services outside their organisational boundaries when developing public services. To illustrate this point, the results indicate that, for instance, when developing public services, a very small number of European public administrations use Internet of Things sources (e.g. sensors) and social media applications. Open Data, eID and eSignature are the sources and solutions most used by public administrations.

Another example is Spain, where there is the DATAOBSAE¹²⁰, a tool that provides a public dashboard of electronic administration indicators for public administration bodies, based on data from horizontal services or external sources. It presents the evolution of indicators, tables and maps that are updated monthly.

119 Further information available at: https://ec.europa.eu/isa2/news/report-recommendations-organising-and-governing-integrated-public-services_en

120 Further information available at: <https://dataobsae.administracionelectronica.gob.es/cmobsae3/dashboard/Dashboard.action>

8) Application of privacy and security principles

There is room for improvement in the application of security and privacy principles in the provision of public services in Europe. These principles should aim at ensuring that controllers comply with data protection legislation. Therefore, European countries should ensure that citizens' information is appropriately protected during transmission, processing and storage with the help of different security processes. According to the results of the monitoring of the implementation of the EIF, eArchive is one of the elements and measures still to be put in place in Europe, followed by the National security framework for public services and the Business Continuity Plan. However, back-up and/or recovery plans, qualified trust services and National eIDs compliant with the eIDAS Regulation are measures that have been implemented in almost all the European countries.

In Portugal, the national eIDAS node is already implemented and in production on the ePortugal.gov.pt web-portal, with the electronic identification scheme concerning the Citizen Card (national eID card) being published in the Official Journal of the European Union (OJEU) on 28 February 2019 and attaining a 'high' level of assurance. Additionally, the electronic identification scheme concerning the Digital Mobile Key (mobile eID mechanism) has also been published in the OJEU, with a 'high' level of assurance.



3.3.2 *Best practices to overcome the obstacles and challenges to interoperability in Europe*

After analysing the main challenges faced by European countries in terms of interoperability, this subsection presents various best practices in fostering interoperability based on the experiences of three countries. Spain, the Netherlands and Norway were selected due to their very positive results in implementing the EIF. Representatives of these countries were invited to demonstrate their know-how in a webinar on the EIF Monitoring Mechanism held on 22 April 2020¹²¹. A summary of their presentations is provided below.

1) NORWAY

The 2017 OECD Digital Government Review of Norway¹²² underlined the high level of digitalisation in Norway's economy and society which creates favourable conditions for digital government within the public sector. Although the review showed that Norway was leading in terms of digitalisation within various sectors, it also highlighted that the country was lagging behind in terms of digitalisation across sectors and between central and local governments. In addition, the 2018 Digitalisation in Central Government report¹²³ of the Office of the Auditor General of Norway underlined that central government agencies only partially reused available information. The report showed that a more centralised governance was necessary in the digitalisation process of the public sector and that there was a large untapped potential for cooperation and coordination among different public administrations.

One of the main initiatives of the country to foster cooperation and coordination has been the publication of the **Norwegian Interoperability Framework**¹²⁴ (NIF) in 2018. It is a national transposition of the European Interoperability Framework (EIF) that aims to help public administrations in defining, developing and managing digital public services, including cross-sectorial ones. Similar to the EIF, the NIF covers organisational, legal, semantic and technical aspects of interoperability and contains principles, conceptual models and guidelines to foster digital interaction across sectors. A central concept of the framework is the reuse of public services as an enabler for information sharing among agencies and as a facilitator for cross-sector interactions between public administrations, businesses and citizens.

In its effort to increase cooperation and coordination among public administrations, Norway also published the architecture principles for public sector digitalisation which were revised in 2019. A new version of the principles¹²⁵ was published in January 2020. The main goal of the initiative is to foster the public sector's interoperability and interactions with businesses. The architecture includes principles on user-centricity, subsidiarity and proportionality, legal interoperability, data sharing and reuse, solution sharing and reuse, support for interoperability, and trust. Each of these seven principles is defined by a set of recommendations and a list of useful resources to be reused. The implementation of the architecture principles is mandatory for public administrations at the national level and recommended for those at the sub-national level (e.g. municipalities).

The main challenges that Norway faced when improving interoperability are related to the prioritisation of efforts, the need for sufficient resources and expertise, and the importance of ensuring the commitment of stakeholders in the different sectors. In fact, the country learned that, through greater stakeholder involvement and participation, the quality of digital service delivery will improve, thus leading to the increased use of digital services. Therefore, to address these challenges, the country appointed experts in various fields (e.g. education, healthcare, security etc.) to work as project leaders for different initiatives in the domain of interoperability. The experts are responsible for reaching the milestones related to the high-level policy goals and objectives.

From Norway's perspective, improvements in digital services are generally based on a user-centric approach. One of their main success factors for fostering interoperability is collaboration.

2) SPAIN

For Spain, interoperability plays a key role in ensuring that the obligations of public administrations met in the provision of digital public services accessible to all in an effective and efficient manner are met. The country has achieved a high level of cooperation among public administrations, citizens and businesses, which is essential for providing quality services and a pre-requisite for interoperability. This effort focuses on the interaction between the national legal framework and the governance of public administrations in order to build consensus on interoperability and reusable services.

121 More information about the EIF Monitoring Mechanism Webinar is available at: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/news/webinar-eif-monitoring-mechanism>

122 OECD, 2017. *Digital Government Review of Norway: Boosting the digital transformation of the public sector*.

123 Further information available at: <https://www.riksrevisjonen.no/globalassets/rapporter/no-2017-2018/digitalisering.pdf>

124 Further information available at: <https://www.difi.no/fagomrader-og-tjenester/digitalisering-og-samordning/nasjonal-arkitektur/arkitekturammeverk-samhandling>

125 Further information available at: <https://www.digdir.no/1065> and the English version is available at: <https://www.digdir.no/media/608/download>

The implementation of interoperability in Spain is the result of a national commitment in alignment with European initiatives and policies. In this respect, the National Interoperability Framework of Spain¹²⁶ (ENI) has been developed in line with the EIF, which was the reference for defining the principles, layers and conceptual model of interoperability. This is not a novel development. In fact, Spain had already aligned its previous ENI with the first version of the EIF and contributed to drafting the new EIF.

To ensure compliance of the ENI with the EIF, Spain implemented a gap analysis based on a traffic light system. The system shows the principles and recommendations that are aligned between the two frameworks in green, and the missing aspects, such as actions to be implemented and/or topics that deserve special attention in yellow or red. This approach helps to define the overall state-of-play of the country and provides policy makers with detailed information when defining the way forward for the country. A similar approach is followed in the context of the Tallinn Declaration¹²⁷.

In conclusion, the most important success factors in promoting interoperability in the country are the continued effort to maintain momentum at the national level, the collective commitment of the different stakeholders and alignment with the EIF.

3) THE NETHERLANDS

One of the main objectives of the Netherlands in promoting interoperability is to facilitate the sharing of knowledge within the public sector, as well as among citizens and businesses as a whole. One of the main initiatives to ensure the implementation of the EIF in the country has been the development of the Dutch Governmental Reference Architecture (NORA) in order to support the design of European cross-border services. A detailed country factsheet on the Netherlands¹²⁸ was published in 2017, in which the way the NORA covers each of the EIF principles was explained.

NORA is a knowledge platform that was developed in 2005 and is the de facto Dutch NIF. Through this platform, knowledge and experience can be shared in order to design new Dutch governmental digital services for citizens and businesses. In 2008, following the national statement on ICT projects (26 643, nr. 128)¹²⁹, the use of NORA became mandatory for all governmental organisations.

By gathering knowledge from several experts in the design of digital services, the platform supports the creation of domain specific architectures with information such as architecture principles for new developments, standards, specifications and useful building blocks. The platform is maintained by governmental and commercial organisations and includes several communities that share their knowledge, insights and agreements on current topics such as privacy, security, case management, semantics and mobility. These communities are related to various sectors, including education, healthcare and social security. As previously mentioned, each of these domains has their own (reference) architecture.

The NORA governance is based on a good balance between functional demand and supply of means. The representatives of the domain specific architectures and the different communities meet every few months as part of an architecture council. The main objective is to agree on what should be shared on the platform to foster better service design and interoperability within the public sector. At these meetings, the representatives of NORA make proposals for future developments. Major changes to NORA follow a “public review” process conducted according to the Management and Development Model for Open Standards (BOMOS).¹³⁰ BOMOS is a methodology for the management and further development of standards in the Netherlands. The annual NORA budget is approximately EUR 500 000.

NORA is also in line with the Dutch policy on the digitalisation of service delivery. This has been achieved through frequent alignments of the architectural principles and current policy documents¹³¹ such as NL DigiBeter2.0¹³² and the Governmental Digital Infrastructure (GDI)¹³³. The core values for service design, such as trust, security, effectiveness and efficiency, and a dozen sub-values form the link between policies and their principles. This connects the different views and terms used by ICT architects on the one hand, and decision and policy makers on the other hand.

126 Further information available at: https://www.boe.es/legislacion/codigos/codigo.php?id=029_Codigo_de_Administracion_Electronica

127 European Commission 2017. *Tallinn Declaration on eGovernment at the ministerial meeting during Estonian Presidency of the Council of the EU on 6 October 2017*.

128 Van Wessel, R. and Brouwer, E., 2017. *Report on the alignment between the new European Interoperability Framework and the Dutch government reference architecture NORA*. ICTU, the Netherlands.

129 Further information available at: <https://zoek.officielebekendmakingen.nl/kst-26643-128.html>

130 Further information available at: <https://www.forumstandaardisatie.nl/nieuws/doe-mee-met-de-bomos-kennisbijeekomst>

131 Further information available at: <https://www.noraonline.nl/wiki/Beleidskaders>

132 Digital Government Agenda, NL DigiBeter2.0. Further information available at: <https://www.rijksoverheid.nl/documenten/rapporten/2019/07/05/nederlandse-digitaliseringsstrategie-2.0>

133 Further information available at: <https://www.vngrealisatie.nl/onderwerpen/generieke-digitale-infrastructuur-gdi>

As several Dutch governmental organisations work within an international context, NORA has set up a “International Architecture”¹³⁴ section which includes information about the EIF and the European Interoperability Reference Architecture (EIRA)¹³⁵ to ensure international coordination and deployment of interoperable services. This section is under development and for the moment, the information is limited to European components and European programmes.

The NORA Wiki also allows users to see how people are using the data from the platform. It is thus possible to monitor the number of visits to the platform and the satisfaction rate of its users. The collection of this data helps to improve the platform.

According to the Netherlands, European programmes for cross-border services, such as the Single Digital Gateway, should reuse the architectural solutions that are provided by the ISA² programme of the European Commission (i.e. EIF and EIRA) as much as possible. In addition, information on cross-border services is scattered in many different European websites, thus making it difficult for everyone to find information. The Netherlands therefore suggested that the EIF and EIRA should be repositioned in the single European Architectural Knowledge Platform that supports all NIFs by means of a semantic Wiki.

In conclusion, the explanatory factor for the Netherlands’ success in fostering interoperability is the sharing of knowledge and information through the NORA platform. This ensures effective cooperation with other service providers and optimal reuse of existing solutions.

134 Further information available at: https://www.noraonline.nl/wiki/Architectuur_internationaal

135 Further information available at: <https://joinup.ec.europa.eu/collection/european-interoperability-reference-architecture-eira/about>



04 | The way forward



4. | The way forward

This report on the state-of-play of digital public administration and interoperability in Europe aims at providing a snapshot of the developments and achievements of European countries and the European Commission with regards to digital transformation in the period 2017–2020. As illustrated throughout the report, the implementation of specific initiatives, legislative measures and infrastructures aimed at supporting the digital transformation and digital transition of the European Union has ensured the successful development of this policy domain. The report also gives an account of the results of the first data collection on the implementation of the European Interoperability Framework (EIF) by the 36 European countries included in the sample of the study, as well as the main obstacles they face when implementing the EIF and some best practices to overcome these challenges.

In order to promote the modernisation and digitalisation of public administrations across Europe, the European Commission has consistently played a crucial role. Although the Commission priorities may shift with the election of a new President, the prioritisation of the digital transformation of the public sector has remained a constant in the EU in the last two decades, particularly with regards to digital public administration and interoperability. Indeed, while it is still in its early days, the von der Leyen Commission has demonstrated a strong intent and desire to pursue the legacy built by the Juncker Commission between 2014 and 2019 on digital transformation. By building off former achievements such as the Digital Single Market strategy, the von der Leyen Commission is ramping-up efforts to bolster the digital transition of the European Union, particularly with regards to secure and borderless public services and data, while also incorporating additional cutting-edge innovations and emerging technologies. Indeed, the von der Leyen Commission has expressed its commitment to develop Artificial Intelligence, 5G, Blockchain and quantum computing, so as to ensure the European Union's position as a global leader in the digital age. Among the key actions of the Digital Europe Programme, the Shaping Europe's Digital Future strategy and the reinforced Interoperability Strategy for EU governments are important milestones for 2021, as they will guide the digital transformation of the Union and ensure the effective implementation of digital public administration and interoperability among the Member States.

Furthermore, ensuring the successful implementation of the EIF will continue to be a top priority for the Member States in the years to come. After obtaining the results from the first data collection of the implementation of the EIF, our analysis gathered that some countries continue to face key challenges when implementing the EIF, particularly with regards to the implementation of the principle of subsidiarity and proportionality. Indeed, some of the analysed National Interoperability Frameworks (NIFs) only partially take into account the 47 recommendations and 12 principles of the EIF. The upcoming evaluations of the ISA² programme and impact assessment of the EIF implementation will be important milestones for 2021 as they will provide further insights and feedback on the level of implementation of the EIF since the beginning of the programme. These evaluations will also present an opportunity for policymakers to assess their progress and set their future priorities in terms of digital public administration and interoperability, by feeding future policy measures, such as the EU governments interoperability strategy. Indeed, even after the ISA² programme ends, it will be essential to sustain and strengthen the ability of European public administrations to work together in order to achieve mutually beneficial goals. It goes without saying that this will require the full implementation of the principles of subsidiarity and proportionality, among others, which are at the core of interoperability.

Lastly, the current COVID-19 crisis has demonstrated the importance of digitalisation across all areas of European economy and society. Indeed, connectivity has kept businesses running during the pandemic and workers connected with one another. New technologies have ensured the continuous functioning of public services and supported children's education. Thus, in the Recovery Plan for Europe, presented by President von der Leyen on 27 May 2020, digital transformation continues to play a crucial role. As stated by the President herself: "The recovery plan turns the immense challenge we face into an opportunity, not only supporting the recovery but also by investing in our future: the European Green Deal and digitalisation will boost jobs and growth, the resilience of our societies and the health of our environment".

In order to correctly deliver this ambitious and comprehensive Recovery Plan for Europe, the European Commission has proposed to review and reinforce its Multiannual Financial Framework (MFF) for the period 2021–2027. Indeed, the Recovery Plan for Europe presented a new emergency recovery instrument, the Next Generation EU, through which the Commission is set to create new tools and further invest in key programmes that will help support the single market, escalate the cooperation between Member States in crucial areas such as health and crisis management, and equip the Union with a budget that will be able to drive the green and digital transitions that the Commission has envisaged. For this, the Union proposed a total budget of EUR 8.2 billion to the Digital Europe Programme, which will support the Union's digital transition and boost its cyberdefences, among others.

As part of the EU Recovery Plan, the European Commission has also adjusted its Work Programme for 2020, fast-tracking certain initiatives in order to further support Europe's recovery. The revised pillar "A deeper and more digital Single Market" highlights the

need for Europe to further invest in better connectivity and new technologies such as artificial intelligence, cybersecurity, super- and quantum computers, as well as blockchain technologies, among others. These investments are foreseen to have spill-over effects on the modernisation of the public sector in Europe, among others. The EU will also need to invest in the development of its civil servants' and private sector's digital skills and know-how, both of which are crucial to ensure citizens' adaptation to this new digitalised and modernised society. Thus, the Commission will propose a Skills Agenda for Europe and a Digital Education Action Plan in the coming months. This, in turn, will ensure that Europe has a real, functioning data and digital economy in place, in order to effectively boost innovation and job growth.



An action supported by ISA²

ISA² is a EUR 131 million programme of the European Commission which develops digital solutions that enable interoperable cross-border and cross-sector public services, for the benefit of public administrations, businesses and citizens across the EU.

ISA² supports a wide range of activities and solutions, among which is the National Interoperability Framework Observatory (NIFO) action. ISA² solutions can be used free of charge and are open source when related to IT.

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