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State of Play of Interoperability in Europe – Report 2016

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“State of Play of Interoperability – Report 2016”

A study prepared for the European Commission in the context of the ISA² programme by:



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Authors:	Roberto Gatti (Partner – KPMG Advisory S.p.A. – Italy) Lorenzo Carbone (Senior Manager – KPMG Advisory S.p.A. – Italy) Valerio Mezzapesa (Manager – KPMG Advisory S.p.A. – Italy)
Reviewers / Approvers	Miguel Alvarez Rodriguez – European Commission DIGIT D2 Project officer of the ACTION 2016.23 NIFO Peter Burian – European Commission DIGIT D2 Project officer of the ACTION 2016.23 NIFO Corinne Gattegno – European Commission DIGIT D2 former Project officer of the ACTION 2016.23 NIFO
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1

Introduction

The European Commission identified the need for interoperability between public administrations over 20 years ago when it established the Interchange of Data between Administrations (IDA) programme to promote the development and operation of trans-European telematic networks for data interchange between Member State administrations and/or EU institutions. Following this various programmes were supported to develop, promote and use interoperability solutions in the European Union. Its current flagship programme to support interoperability, the ISA² programme runs from 2016 to 2020.

In 2010, the Communication “Towards interoperability for European Public Services” was adopted, containing the European Interoperability Strategy (EIS) and the European Interoperability Framework (EIF). Since then, the EIF has established itself as a leading reference and the basis of most National Interoperability Frameworks (NIFs) and strategies in Europe.

The National Interoperability Framework Observatory (NIFO)¹ was established by the European Commission in the context of the implementation of the ISA programme and continues under its successor, the ISA² programme, in order to measure progress and monitor the State of Play of interoperability in the Union.

The DSM Strategy for Europe, adopted by the Commission on 6 May 2015, recognises interoperability as a prerequisite for a digitally interconnected Union and calls for the revision and extension of the existing EIF.

This report presents the highlights of the results of the 2016 monitoring exercise and the comparison with the preceding ones. It also details the new emerging trends and the needs of the Member States regarding the current EIF, which show that public administrations still need more guidance on how to improve governance of their interoperability activities.

The State of Play 2016 report will be the last one under the current version of the EIF (EIF v2.0). The new European Interoperability Framework will be adopted end March 2017.

Interoperability is a key factor in making a digital transformation possible

¹ Source: https://ec.europa.eu/isa2/actions/fostering-national-interoperability-frameworks-across-europe_en (last consulted on 24/05/2017)

² COM (2015) 192 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – A Digital Single Market Strategy for Europe, Brussels, 06.05.2015.

The **ISA² programme** is the follow-up of its predecessor the ISA programme (Interoperability Solutions for European Public Administrations), and runs from 2016 to 2020. ISA² focuses on specific aspects, such as:

- Ensuring correct coordination of interoperability activities at EU level;
- Expanding the development of solutions for public administrations according to businesses' and citizens' needs;
- Proposing **updated versions of tools that boost interoperability at EU and national levels, namely the European Interoperability Framework (EIF) and the European Interoperability Strategy (EIS); the European Interoperability Reference Architecture (EIRA) and a cartography of solutions: the European Interoperability Cartography (EIC).**

In the context of the **Digital Single Market Strategy for Europe³**, ISA² **monitors and supports the EIF implementation** and is also well aligned with the

Connecting Europe Facility programme (CEF programme⁴), the Union's funding instrument for trans-European networks in the fields of transport, energy and telecommunications. It is also aligned with the future eGovernment Action Plan 2016-2020, which includes making the interconnection of business registers a reality, leading an initiative with the Member States in 2016 to pilot the 'Once-Only' principle and accelerating Member States' transition towards full e-procurement and interoperable e-signatures. ISA² is also one of the enabler and contributor programmes for public sector innovation in Europe.

³ COM (2015) 192 final - Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the committee of the regions - A Digital Single Market Strategy for Europe. 06.05.2015.

⁴ The CEF supports the deployment and operation of key cross-border digital services





1.1 Promoting the concept of interoperability: a bit of history

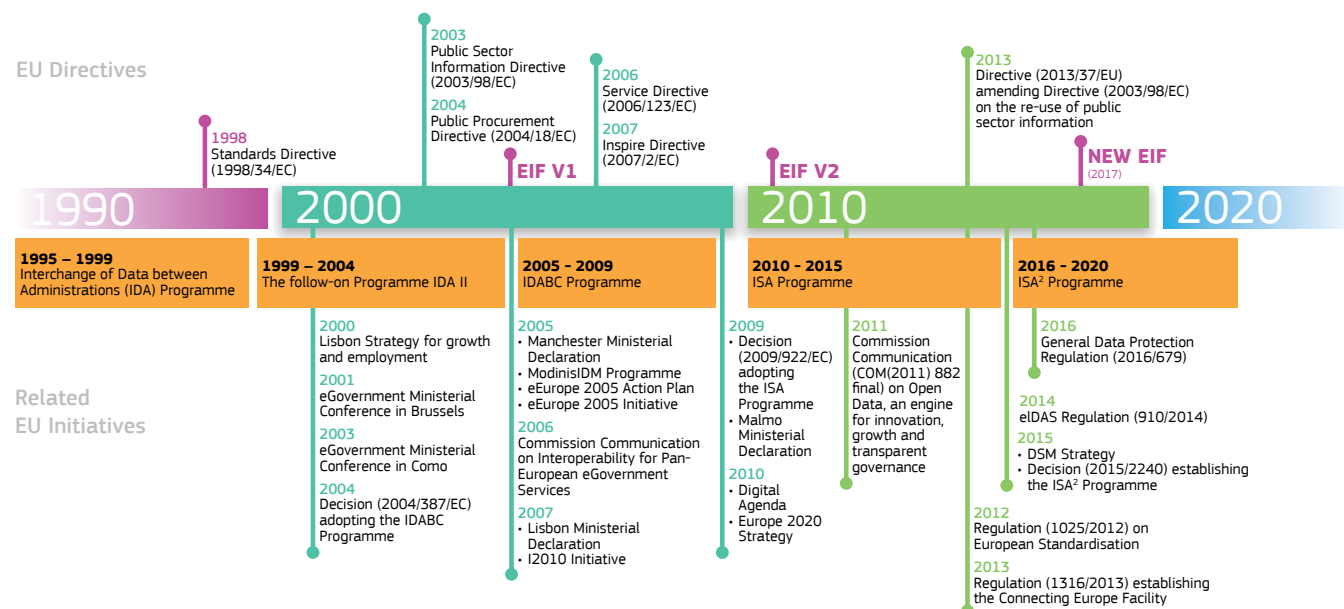


Figure 1 Timeline of EU initiatives concerning interoperability

Promoting the concept of interoperability of public services in Europe among information and communication systems was at the heart of the **Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens programme (IDABC)**⁵ established in 2004 by the EP and the Council⁶.

The **eEurope Action Plan 2005** urged the EC “to issue an agreed **Interoperability Framework to support the delivery of pan-European eGovernment services to citizens and enterprises**”, by addressing information content and recommending technical policies and specifications to help connect public administrations’ information systems across the EU.

The **European Interoperability Framework for pan-European eGovernment Services version 1.0 (EIF V1.0)**⁷ was subsequently published in.

In 2009, the Ministerial Declaration on eGovernment was signed in Malmö (Sweden). As inspiration for the eGovernment Action Plan 2011–

⁵ Established by Decision 2004/387/EC

⁶ The IDA Work Programmes focused on improving the effectiveness of telematics information exchanges between PAs. For more information, please consult: <http://ec.europa.eu/idabc/en/document/2548/3.html>

⁷ Source: <http://ec.europa.eu/idabc/servlets/Docd552.pdf?id=19529> (last consulted on 24/05/2017)

2015, the **Malmö Declaration** urged Member States to achieve more effective cross-border services and the completion of the Single Market, as well as promoting open specifications to ease the path of new products and aligning NIFs with applicable European frameworks.

In order to complement the Malmö Declaration, the Ministerial Declaration on the European Digital Agenda, the Granada Declaration, was introduced. The latter covered a wide range of relevant areas such as cyber security, eHealth, eGov and interoperability.

The ISA programme, successor of IDABC focused on boosting the long-standing initiative of the EC to create an EU free from electronic barriers at national borders by developing and implementing Information and Communication Technology (ICT) solutions at national level⁸.

In 2010 the EC published **the Communication ‘Towards Interoperability for European public services’, containing the European Interoperability Framework for European public services (EIF V2.0) and the European Interoperability Strategy (EIS)**.⁹

The **second version of the EIF** acknowledges the existence of the NIFs¹⁰, and has widened its area of intervention to include the legal and administrative environment, advances in various eGovernment programmes in Member States and technological and ICT marketplace developments.¹¹

In May 2015, the Juncker Commission issued the “**Digital Single Market Strategy for Europe**” (DSM), which aims to eliminate digital barriers and foster online opportunities while ensuring the free movement of goods, persons, services and capital and fair access online of goods and services. The DSM foresees 3 policy areas¹², from which the **third pillar is particularly relevant in the context of interoperability**: “Considering the digital economy as a driver for economic growth”.

The revision of the EIF was undertaken in this context and under the umbrella of the ISA² programme, successor of the ISA programme.

A new Communication was adopted at the end on 23rd March 2017, “Communication (COM(2017)134)” by the European Commission, containing a new version of the EIF. The successful implementation of the new EIF will improve the quality of European public services and will create an environment where public administrations can collaborate digitally.

⁸ Source: <http://ec.europa.eu/idabc/en/document/7841.html> (last consulted on 24/05/2017)

⁹ Source: https://ec.europa.eu/isa2/sites/isa2/files/actions/documents/annex-ii_en.pdf (last consulted on 24/05/2017)

¹⁰ Source: <http://ec.europa.eu/idabc/en/document/7728.html> (last consulted on 24/05/2017)

¹¹ Source: <http://ec.europa.eu/idabc/servlets/Docbcb3.pdf?id=31507> (last consulted on 24/05/2017)

¹² Source: https://ec.europa.eu/priorities/digital-single-market_en (last consulted on 24/05/2017)

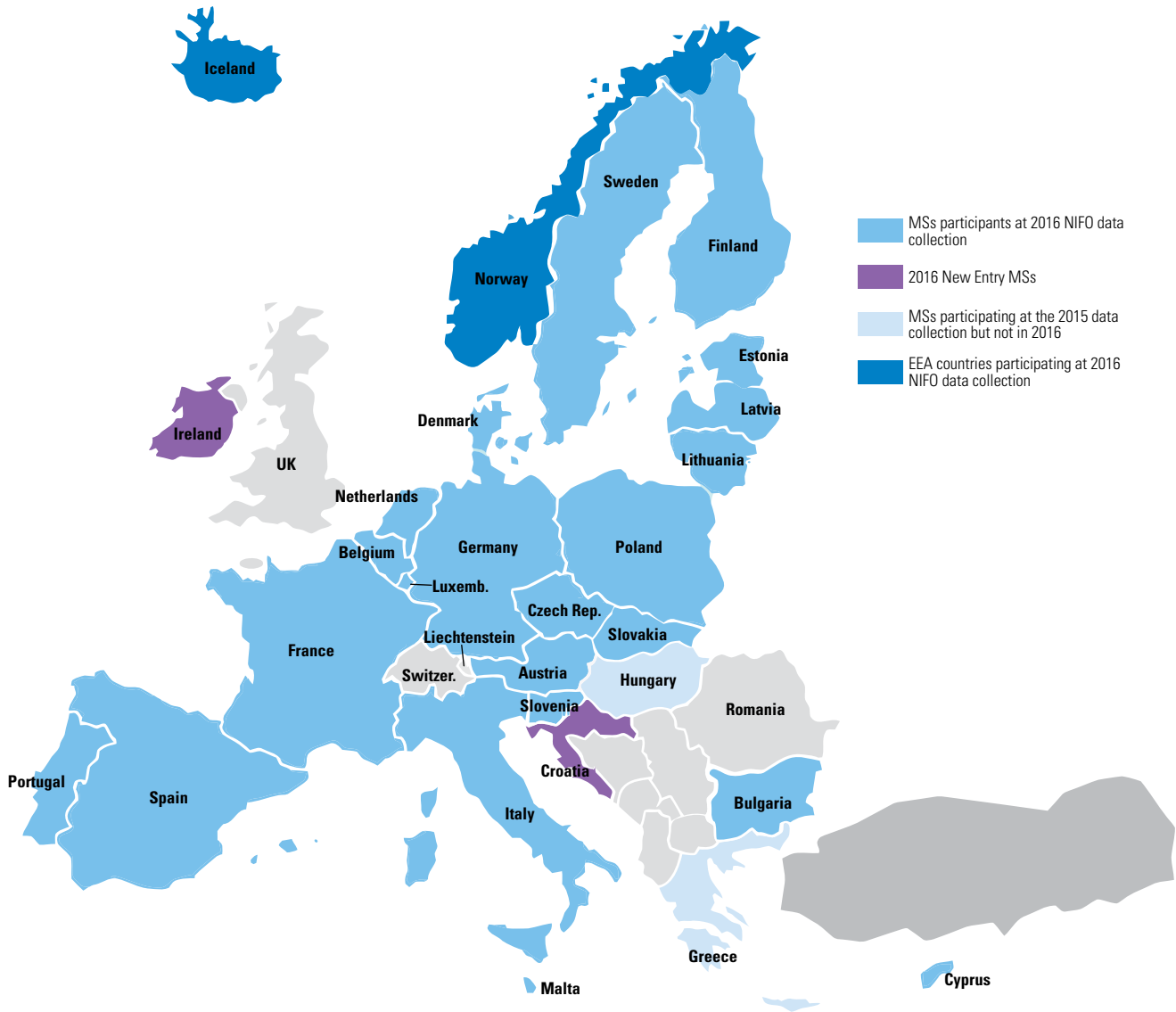
The observatory on interoperability (referred as NIFO) is accessible on Joinup¹³, and **namely embodies an online tool for observing and comparing a number of aspects of interoperability frameworks.**¹⁴



¹³ Source: <https://joinup.ec.europa.eu> (last consulted on 24/05/2017)

¹⁴ Source: <http://ec.europa.eu/idabc/en/document/7796.html> (last consulted on 24/05/2017)

Countries participating in NIFO measurements:







2

State of Play of Interoperability 2016

This section presents a summary of the analysis of the level of **NIF-EIF alignment, NIF Implementation and NIF Monitoring** based on the NIFO data collection exercise performed during 2016.

26 countries participated to the 2016 measurement related to alignment and implementation and 22 on the monitoring.



2.1 2016 NIF-EIF Alignment and Trend Analysis

There is an overall excellent NIF-EIF alignment across countries for 2016, with slight increase if compared with previous years

The overall average of the NIF-EIF Alignment level for 2016 is 75%, with 23 countries scoring over 50% and among them 12 of these scoring over 80%.

A NIF can be one or more documents that define frameworks, policies, strategies, guidelines and action plans on interoperability in a Member State.

76%

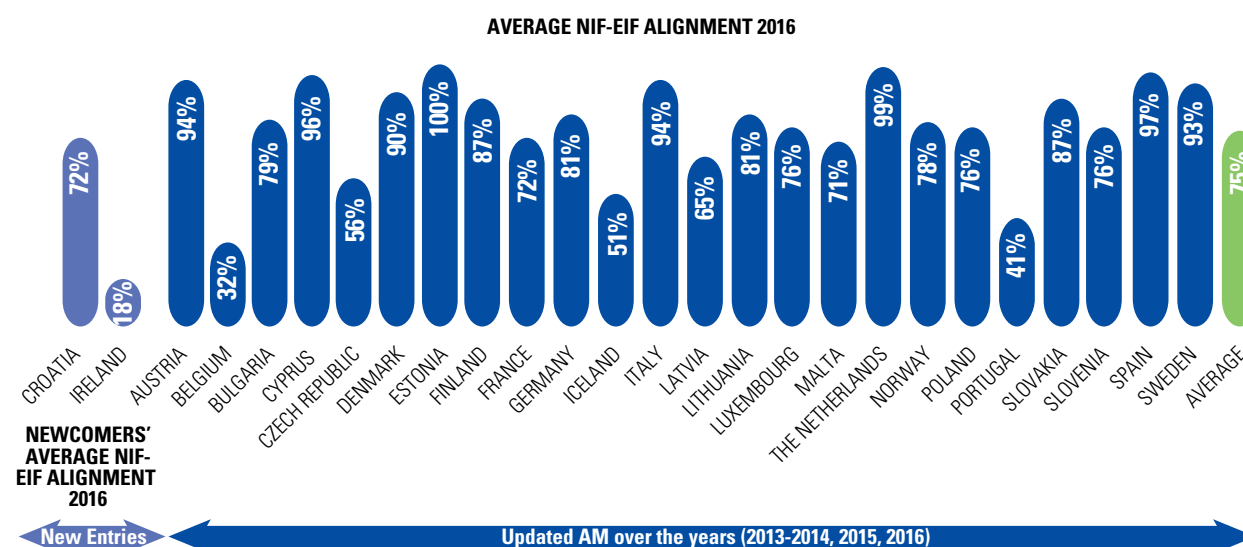


Figure 2 Average NIF-EIF Alignment 2016

Most of the countries scoring high have had a NIF since a long time span.

- **Croatia** has already a **strong maturity level** in NIF-EIF alignment (average of 72%) namely thanks to the recent development of its **e-Croatia Strategy 2020** in which the EIF has been based as the basic NIF for Croatia.
- **Ireland** NIF shows a strong focus on its principles dimension as well as on its interoperability governance.
- **Denmark** is in the process of initiating implementation of a new cross-governmental digitisation strategy, which has a renewed focus on architecture and standards in relation to interoperability. It includes a revision of the Danish NIF (final version expected in June 2017) as well as a completely new governance set-up and a much stronger focus on governance and monitoring including review of projects.
- **Estonia** updated its Governance Model appointing the Information System Authority (subdivision of the Estonian Ministry of Economic Affairs and Communications) that manages the Architecture Committee (AC) that will discuss topical issues and problems in relation to interoperability. In addition to the AC, there are 4 sub-committees: eID, X-Road, basic infrastructure and e-services (attended by service owners).
- **In Finland**, new principles for digitalisation were introduced early 2016: including, as a first rule, the need to develop user-oriented services in order to ensure the “User-centricity” Principle.
- **Croatia, France, Latvia, The Grand Duchy of Luxembourg (hereinafter Luxembourg)** and **Malta**, are slightly below the overall alignment.
- **Iceland** is currently working on building up and implementing the NIF in Iceland with a group of IT specialists from all the key public institutes and ministries. The Icelandic NIF will support the development of the public e-service in Iceland and will play a more significant role in e-Government policy in the years 2017–2020: eGov projects should contain an evaluation for a need for interoperability at national and/or European level.
- **Spain** has a very good alignment score that is now supported by the new commitment of Spanish PSs to publish updated information describing all their administrative procedures. The new Digital Transformation Plan for the General Administration and Public Agencies (2016–2020) mandates the updating of the catalogue of administrative procedures.
- The new **Czech** “Strategic framework for public administration development 2014–2020” continues to support the subsidiarity and proportionality principle. In fact regional administrations, for example the Vysočina region are developing their strategic ICT projects, supporting central initiatives.

- **Belgium** has focused on ensuring better Organisational Interoperability by voting the “Service integrator” act. This organisational relationship has also improved through eGovernment agreements and regular meetings between the federal and regional level.
- **Greece** and **Hungary**, provided no data for 2016 and had an alignment score of 66% and 47% respectively in 2015.

The following chart presents the **average alignment for each EIF dimension** (Principles, Conceptual Model, Interoperability Levels, Interoperability Agreements and Interoperability Governance). The **blue bar** shows the average alignment (calculated as the average of the scores for all countries for each of the 5 dimensions). The **green spot** indicates the highest level of NIF-EIF alignment for each dimension (measured as the highest score reached by a country) and the **orange spot** the lowest level of alignment per dimension (measured as the lowest score reached by a country).

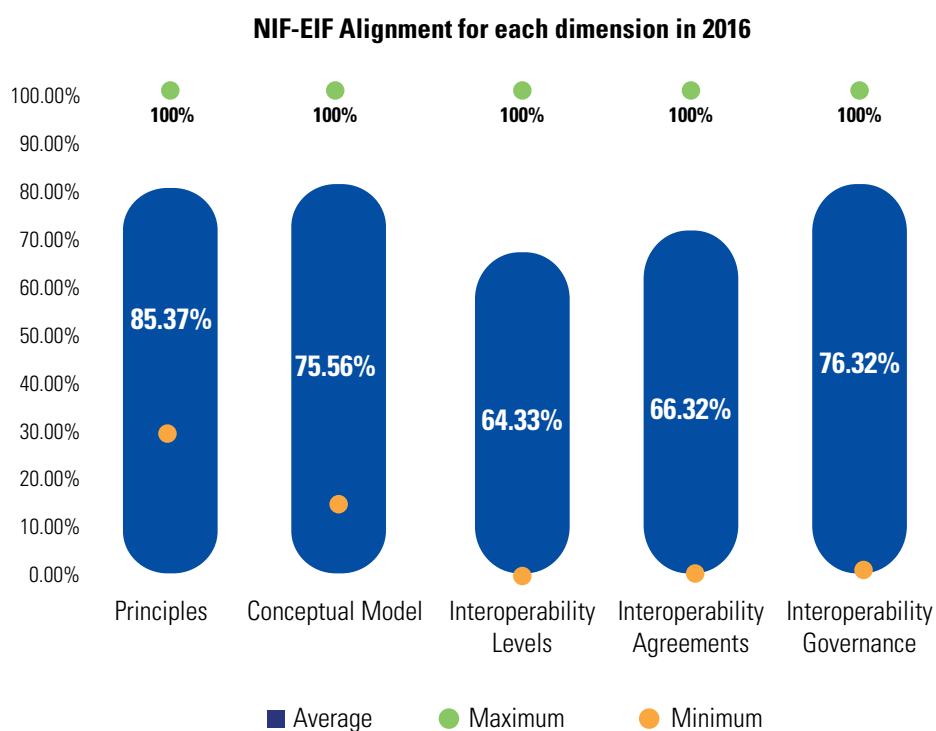


Figure 3 NIF Alignment for each dimension, 2016

All 5 dimensions reach 100% alignment by at least one country. The overall very good alignment among countries can be observed from the very high and similar average score overall for the 3 dimensions: Principles (80,3%), Conceptual Model (80,8%) and Interoperability Governance (80,8%). The lowest alignment score is confirmed with regard to the dimension of Interoperability Levels (66,7%), likewise in the previous NIFO data collection exercises.

Concerning the Interoperability Governance dimension, on **15 July 2014, the Croatian Parliament adopted the Act on State Information Infrastructure**, which regulates the rights, obligations and responsibilities of competent public sector bodies with regard to the establishment, development and management of the state information infrastructure system-The Act on State Information Infrastructure establishes and manages the public register system and the conditions which the state information infrastructure has to provide regarding public registers, as well as the use of a common base for a secure data exchange within the state information infrastructure system, a common identification and authentication system, a single point of interaction with citizens and other users.



Ireland – The Open Data Initiative

Regarding the **Principles dimension**, Ireland developed “**The Open Data Initiative**”, thereby becoming compliant with the opened principles as well as the reusability principle. A key element of public service reform activities in Ireland, **the Open Data Initiative is closely aligned with the Public Service Reform Plan**, the Public Service ICT Strategy, and the Civil Service Renewal Plan. It is a core element of the EU-wide approach to the “Re-Use of Public Sector Information”, which has been transposed by Ireland. It is also central to the country’s participation in the Open Government Partnership (OGP).

Looking at the lowest level of alignment, the chart illustrates particular gaps for the dimensions of **Interoperability Levels**, **Interoperability Agreements** and **Interoperability Governance**; with respect to the average alignment of 66,7%, 71,2% and 80,8% respectively, some MSs do not align at all (the lowest score being 0%). The gap is less in the case of **Principles** and **Conceptual Model** where the lowest percentage value is 29,2% and 14,3%, respectively.

The difference between lowest and highest scores reflects the different levels of maturity of the NIFs in the countries assessed.

2.1.1 NIF-EIF Alignment Evolution

Figure 4 below provides a figurative representation of the whole evolution of the main trends in NIF-EIF Alignment since 2013:

NIF-EIF ALIGNMENT EVOLUTION OVER THE YEARS

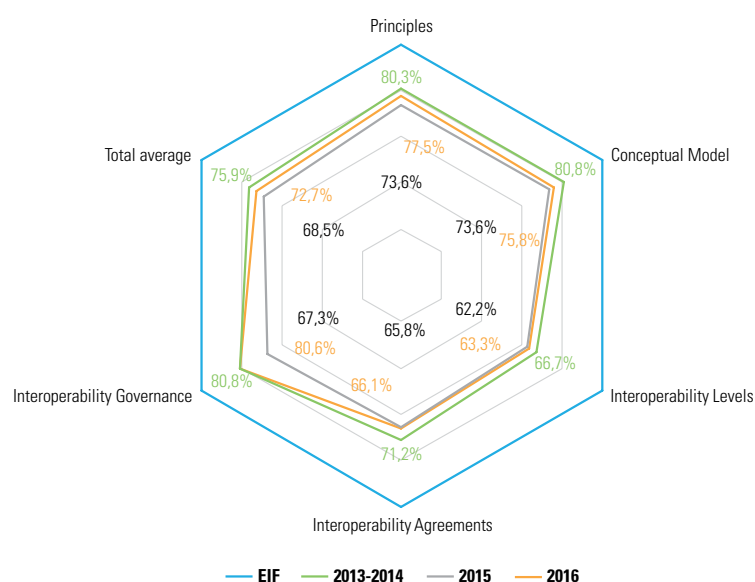


Figure 4 Trends in NIF-EIF Alignment for each dimension, 2016

The overall average NIF-EIF alignment of the MSs assessed increased by 6,2% in absolute value and by 9% in percentage increase from the previous exercise (2015) to the current exercise.

At the level of EIF dimensions the average of the NIF-EIF alignment evidenced a particular increase in the “Interoperability Governance” dimension (an increase of 13,5% in absolute value and 20% in percentage increase), thanks to Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Iceland, Ireland, Italy, Luxembourg, Malta, The Netherlands, Slovakia, Slovenia and Spain which all achieved a 100% alignment. This dimension is the one with best alignment and improvement, followed by the Conceptual Model (relative percentage increase of 9,7%) and Principles (increase of 9,2%).

Belgium and **Spain** improved in their overall average alignment thanks to an increase in the Interoperability Levels dimension, while the **Czech Republic** and **Finland** showed an improvement in the Principles dimension.

Portugal attained an overall substantial evolution from the 2015 exercise to that of 2016 with a particular rise in the Principles dimension. Portugal assures the subsidiary principle by developing an Interoperability Platform whose operations are based on authoritative sources of information. This is in conformity with Portuguese legislation which voted to promote Administrative Simplification (Decreto-Lei nº 73/2014).

The **Cypriot** excellent level of average alignment is particularly due to major increases in 3 different dimensions:

- The rise from **75% to 95,8% in Principles** is due to the fact that the Cypriot eGovernment IF (Cyprus eGIF) plans to provide personalised eServices at the maximum possible level of sophistication that will grant service users the possibility to interact with Pas any time and in the easiest way possible. From a user-centricity standpoint, electronic environments will have a consistent design and will be user-friendly as well as understandable, meaning they plan to be readable, predictable and interactive. Furthermore, in order to ensure the preservation of information principles, government organisations will keep records of transactions with citizens and businesses in their information systems, while retaining their legibility, reliability and integrity and ensuring their accessibility as long as needed, also taking into consideration security and privacy.
- The **exponential rise from 85.7% to 100% in the Conceptual Model** arises from the fact that Cyprus reuses the existing functionality components, which conform to the eGIF's principles and requirements and avoids developing the same services in government organisations' own ICT infrastructures, while simultaneously cutting development time and cost.
- Cyprus succeeded in increasing its score from a compliance of **50% to one of 90% in Interoperability Agreements**. In its contribution to the standardisation process, Cyprus created an implementing body and/or contracting authority responsible for conceptual design, detailed analysis, preparation and management of horizontal IT projects in the field of eGovernment eGIF Governance: the **Department of Information Technology Services (DITS)**. The DITS focuses on improving services offered to the public, increasing productivity and efficiency, and decreasing functioning costs and saving time and resources. The DITS promotes the implementation of vertical/sectorial projects and participates in the design tender implementation monitoring and overall approval of key eGovernment systems.

The Estonian experience of governance interoperability¹⁵

Since 2011, the **Estonian Informatics Centre has been re-organised as the Estonian Information System Authority (RIA)**, with the mission to “coordinate the development and management information system so that Estonian citizens are served in the best possible way.” It coordinates all Public Key Infrastructures related to the operation of ICT and Information Technology (IT), such as the State portal, the middleware system X-Road, the Government backbone network EEBone, **the Administration System of the State information System (RIHA)** and the electronic document exchange centre (DVK). The objective of **RIHA** is **to ensure the interoperability of public sector information systems and the re-use of technical, organisational and**

semantic resources, in order to provide a clear view of the State registers and the services provided by them. RIHA includes metadata about existing public sector databases – ranging from information on the administrators of the databases to the eServices offered and the technical data concerning the environment/platform.

¹⁵ Source: https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/eGovernment%20in%20Estonia%20-%20February%202016%20-%202018_00_v4_00.pdf (last consulted on 24/05/2017)





2.2 NIF Implementation and Trend Analysis



There is an overall fair NIF implementation across MSs for 2016, which is higher than the overall average of NIF Implementation for 2015 (44%)

The overall average of the NIF implementation level for 2016 is 56% with 16 countries scoring over 50% and 5 of these scoring over 80%:

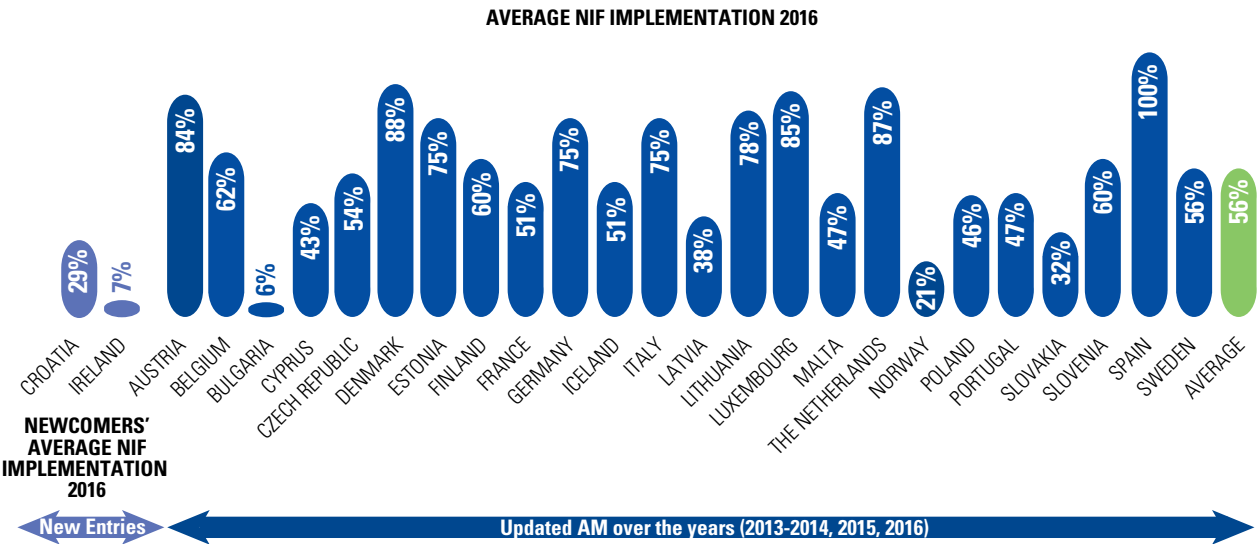


Figure 5 Average NIF Implementation 2016

It has been observed that countries with only a few implementation examples such as **Bulgaria**, **Ireland** and **Norway** score less than countries with a systematic, large-scale and organised implementation plan.

Also, the lower the maturity level is, the more time is needed for that country to implement its NIF among PAs.

Croatia developed the “e-Citizens platform”¹⁶ which is a platform for e-services with a National Identification and Authentication System and which provides a mailbox for all citizens of Croatia. More than 50 messages are sent to Croatians and they are to a large extent proactive. For instance, this service provides information to citizens about their ID-card expiration or their car registration. This platform is compliant with the Principles dimension, in particular with the user-centricity principle and the inclusion and accessibility principle, as well as with the Conceptual Model.

Ireland – Implementation of an online Identity Authentication solution: Standard Authentication Framework Environment (SAFE)

In 2016, Ireland has developed its first framework for establishing and authenticating an individual's identity for the purposes of access to public services: **Standard Authentication Framework Environment (SAFE)**. This face-to-face registration process validates documentary evidence, facial image capture and matching, and signature capture.

A Public Services Card (PSC) is issued to support this registration process. This authenticated identity data can be made available to other public service providers, which avoids the need for repeated capture and validation of identity data in respect of the same individual. The Irish Government also approved the use of the PSC for all existing card-based schemes where possible or to ensure compliance with the SAFE standard, in cases where the use of the PSC was not possible.

SAFE facilitates the provision of end-to-end and high-value transaction services digitally, **MyGovID**, implemented in February 2016, by the Department of Social Protection (DSP). Access is available initially to DSP services but the MyGovID service will be made available for use by all Government Departments and agencies. As a result, all agencies will have shared access to and use of identity information to make it easier for customers to use the full range of Government services.

¹⁶ Source: <https://joinup.ec.europa.eu/community/nifo/case/interoperability-croatia-e-citizens-project> (last consulted on 24/05/2017)



In August 2016, **Denmark** began implementation of the new cross-governmental digitisation strategy, which has a renewed focus on architecture and standards in relation to interoperability. It includes a revision of the Danish NIF (the final version of which will be delivered by June 2017) as well as a completely new governance set-up and a much stronger focus on governance and monitoring, including review of projects. This new version will revise all topics regarding the common architecture on the ABB level, including for instance, a new reference architecture, rules for data modelling, integration patterns, technical standards/protocols. Most of this work is part of strategy-initiative 8.1 “Good Data and Efficient Sharing of Data”, which also includes activities on communication and competence development among stakeholders in the strategy regarding the NIF.

Luxembourg satisfies the multilingualism principle by making nearly all public online services available in the national languages (French, English and German): for instance, guichet.lu, culture.lu and luxembourg.lu are in French, English and German, www.innovation.public.lu is in French and English; while www.visitluxembourg.com covers 8 languages.

In addition, Luxembourg implemented a conceptual model with the common standardised Java framework: MyGuichet architecture and standards for online services for the register of physical persons.

Belgium ensures the reusability principle by making sure that Fedict's Fast2Web services use “OpenFed” to power 50+ other federal websites.

Furthermore, Belgium encourages that interoperability agreements are based on existing formalised specifications, for instance DCAT-AP is implemented for data.gov.be; and the “OSLO” work developed by the region of Flanders, is built upon the EU Core Vocabularies.

Slovenia is convinced that an open and transparent PA permits the public to monitor the work of public authorities and has an impact on their work via cooperating in decision-making processes and holding decision-makers responsible. The Slovenian Ministry of PA, as the competent ministry in the field of transparency, has access to public information and public procurement. It carries out a number of systemic activities to achieve greater openness in the functioning of wider public sector authorities, with the intention of preventing corruption risks. In addition to regulatory frameworks, transparency of the public sector in the Republic of Slovenia is ensured by the following online applications:

- The **Public Sector Authorities Register – RZIJZ – managed by the Agency of the Republic of Slovenia for Public Legal Records and Related Services**. It is a register of public information, *i.e.* a register which offers an overview of all business entities who use public funds (state authorities, local community authorities, public

agencies, public funds and other entities of public law, holders of public authorisations and public service providers) or operate with assets owned by the State or municipalities (companies largely owned by the State or municipalities). The information from the register is available free of charge and for re-use (XML format).

- **Publication of public sector transactions by the Public Payments Administration of the Republic of Slovenia.** The Public Payments Administration of the Republic of Slovenia (UJP) is, in accordance with Article 10 of the Public Information Access Act, authorised for the publication of account transactions of persons subject to public information. The UJP prepared an online application TZIJZ which offers an insight into the public information on transactions carried out by public economic institutions, public corporations, business entities 100% owned by public sector entities and other users of budget resources registered in the Public Sector Authorities Register (RZIJJ) managed by the Agency of the Republic of Slovenia for Public Legal Records and Related Services. The UJP acquires transaction data from its own records; transaction data of other entities is acquired from commercial banks which manage their current accounts.

The **French Government** is implementing initiatives on a large scale contributing to reduction of the administrative burden; thus, contributing to the administrative simplification principle. France's "Marché Public Simplifié" makes it easier for companies to respond to public tenders. Instead of entering their company details, they can use their SIRET number: a 14-digit number that identifies French companies and institutions. MPS is one of two "Say it only once" projects that aims at reducing the administrative burden on companies. The other project – APS (Aide Publique Simplifiée) makes it easier for companies to apply for government loans and grants.

Cyprus pursues its Government Gateway Portal, **Ariadni**, already mentioned in the 2015 Cypriot AM, and improves it. **Ariadni**, one of the Cyprus Government Information Systems, consists of an eSignatures project in collaboration with the office for Government reform under the Deputy Minister to the President. This information system not only offers access to all electronic services to the public (at the moment 33 eServices are feasible through the Portal **Ariadni** over the internet), but also enables the Cyprus Government to issue its own certificates. All executions on online transactions are completed in a secure manner. **Ariadni** aims to conduct the full electronic completion of a service, by retrieving required information from the interconnected back-end systems, which minimises or completely avoids any bureaucratic procedures.

Figure 6 below shows the average NIF alignment for each NIF dimension. The **blue bar** shows the average NIF alignment (calculated as the average of the scores for all countries for each of the 5 dimensions).

Latvia's e-index – National eGovernment benchmark for state institutions and municipalities¹⁷

In December 2015, Latvia released the national **e-index**: the **first national-level initiative helping state and municipal institutions to evaluate their digital development**, to **assess the necessary approaches and provide solutions for a more efficient development**, as well as **to identify the best examples implemented by other institutions** and thereby **enable exchange of experience and motivate further development of the digital transformation**. "Latvia's e-index" initiative was launched by the Ministry of Environment Protection and Regional Development (VARAM) and the ICT company "Lattelecom", with the aim to develop a system for the evaluation and benchmarking of the digital transformation processes by municipal and state institutions. "Latvia's e-index" (the Latvijas eIndekss) partnership initiative was nominated as the European Public Sector Award Best Practice example in 2015.

¹⁷ Source: <https://joinup.ec.europa.eu/community/epractice/case/latvia%E2%80%99s-e-index-national-egovernment-benchmark-state-institutions-and-muni> (last consulted on 24/05/2017)

The **green spot** shows the highest level of NIF-EIF alignment for each dimension (measured as the highest score reached by a country) and the **orange spot** the lowest level of NIF alignment per dimension (measured as the lowest score reached by a country).

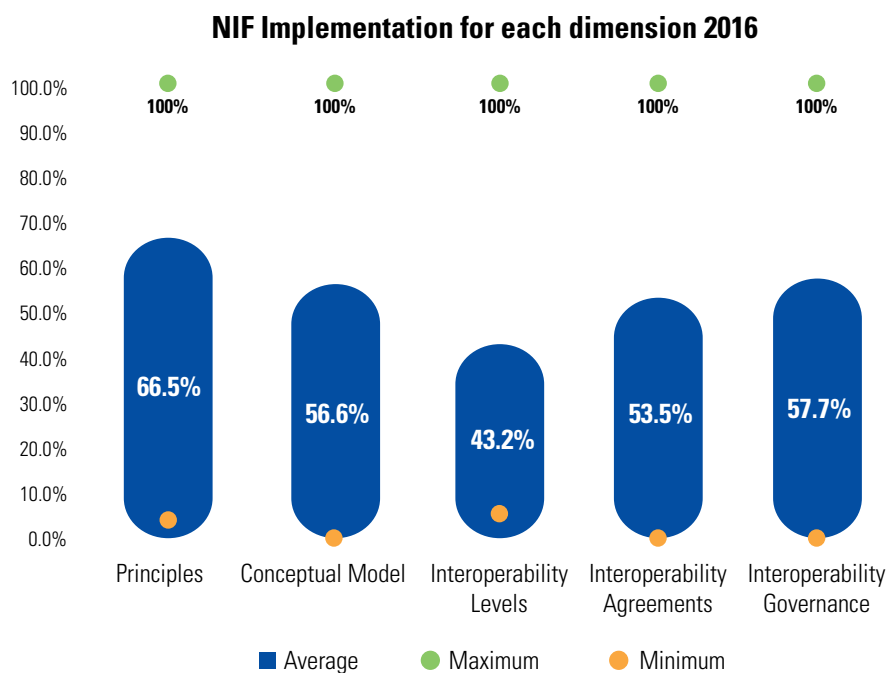


Figure 6 NIF Implementation for each dimension, 2016

All 5 dimensions reach 100% implementation by at least one country. With 66,5%, the dimension Principles shows the highest average implementation score, followed by Interoperability Governance (57,7%) and Conceptual Model (56,6%).

Countries tend to score high on the Principles dimension, 66,5% of overall implementation, representing nonetheless the smallest increase from 2015 among all the 5 dimensions: Principles had a relative percentage increase of 14,3% or increased by 8,3% in absolute value from 2015 to 2016. Whereas, where countries currently have the lowest score of implementation – Interoperability Levels – is the dimension in which they demonstrated the largest increase compared to the 2015 NIFO data collection exercise: 43,2% of overall average of the dimension Interoperability Levels in the NIF implementation in 2016 compared with 30,1% in 2015, representing a percentage increase of 43,3%.

Looking at the lowest level of implementation, this chart shows particular gaps for the dimensions of Principles and Interoperability Levels; with respect to the average implementation of 66,5% and 43,2% respectively.

The difference between lowest and highest scores is reflected by the different levels of maturity of the NIFs in the countries assessed here.

2.2.1 NIF-EIF Implementation Evolution

Figure 7 below presents a figurative representation of the evolution of the dimension Implementation from 2013–2014 to 2016

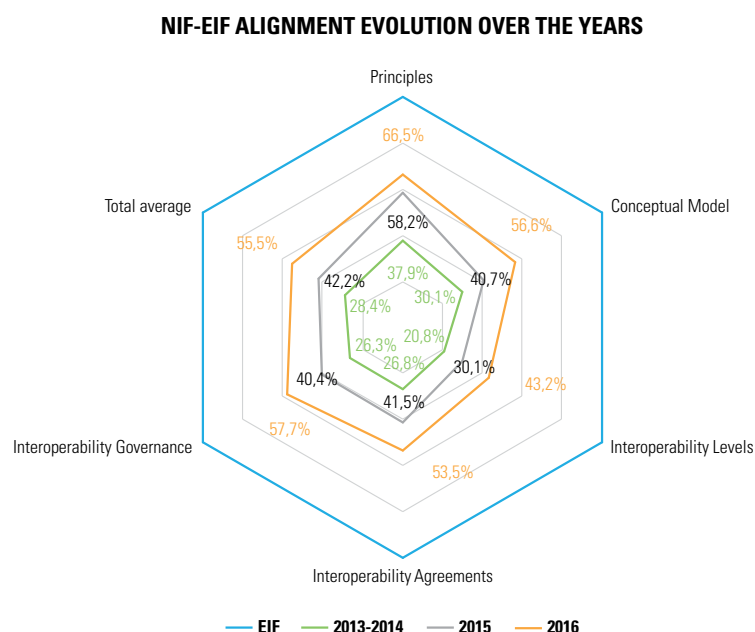


Figure 7 Trends in NIF-EIF Alignment for each dimension, 2016

The overall average NIF implementation of the assessed countries increased by 12% in absolute value and by 27% in percentage increase from the previous exercise (2015) to the current exercise (2016).

This embodies a very strong increase in the overall of implementation of MSs' NIFs with the EIF.

A fairly distributed increase can be observed in NIF implementation from MSs according to the EIF over the years (2013–2014, 2015, 2016).

In 2016, Spain represents the only MS to have a full implementation plan

Countries that significantly increased their score, meaning they succeeded in sustaining implementation of their NIF according to the EIF are: **France, Luxembourg** and Slovenia.

Latvia moved to an overall average implementation score of 38%. The 2 dimensions that contributed most to this substantial increase are Interoperability Governance in which the MS on the Baltic Sea reaches

full implementation (100%) and Conceptual Model in which it scores more than half (57%). Also, the newcomer **Croatia** achieves an overall average implementation score of 29% of its NIF according to the European established IF.

Slovakia (32%) improved its overall average implementation percentage by an absolute value increase of 10% from 22% in 2015 to 32% in 2016. This MS has recently redesigned and implemented the Central Metainformation System that assists with interoperability monitoring as well as with the enterprise modelling of the whole eGovernment ecosystem. This Meta-information System of PA can be used for conceptual modelling of e-Gov systems and services

Slovenia ensures its preservation of information principle by implementing an electronic archive environment and procedures

The Slovenian electronic archive **e-ARH.si** project represents a complex archiving environment and procedures (digitised and originally digital form) for professional treatment and long-term storage in accordance with applicable legislation. This project is in accordance with ISO 14721: 2003 (OAIS reference model) and has been realised within the framework of the Slovenian public archives services (SJAS) through its own organisational and information infrastructure.

Ireland my Account portal: a secure online service for the Irish tax system and customs administration¹⁸

The previously established secure online services, the Revenue Online Service (ROS) tax and customs administration and Pay-As-You-Earn (PAYE) for taxpayer base, led to the development and the implementation of the **myAccountportal**. This service

provides a single point of access for secure online services (excluding ROS) such as PAYE Anytime, Local Property Tax (LPT), Home Renovation Incentive (HRI) (etc) using a single login and password. This new service – myAccount – is not only quick, easy, and secure, it also allows customers to interact with the Revenue Service on the device of their choice when it suits them best. It embodies **the most convenient way for Irish citizens to self-manage their tax affairs**, and allows them to access PAYE Anytime and other online services. Provision of a secure and reliable service is a key underpinning of the myAccount service.

Moreover, customers are now able to retrieve their password immediately by text or email through the use of Government data that verifies the customer's identity in real-time; as additional data becomes available to the Revenue Service, they can now register and access myAccount instantly.

¹⁸ Source: <https://joinup.ec.europa.eu/community/nifo/case/my-account-portal-secure-online-services-irish-tax-and-customs-administration> (last consulted on 24/05/2017)



Italy makes easier the access to public data through portals¹⁹

The mission of the Italian Digital Agency (AgID) is to manage the implementation of the Italian Digital Agenda's objectives, in coherence with the EU Digital Agenda.

Within this system, **AgID launched the initiative #Data4all** which aims to facilitate access to specific Italian PA open data available in 3 distinct portals: SoldiPubblici, ItaliaSicura and OpenExpo. These thematic portals have been developed and launched by Public Institutions with the support of AgID in order to make available to anyone and monitor and analyse both financial information, including budgets, spending and public contracts, and data on construction sites and disaster events (e.g. floods, landslides, etc.).

#Data4all provides a single access point for information about these 3 aforementioned principal open data projects implemented by the Presidency of the Council of Ministers. It has been a principal focus of the national open data portal dati.gov.it used to filter the **metadata** regarding SoldiPubblici, ItaliaSicura and OpenExpo. In other words, it fully embodies a narrative frame for external communication to citizens, practitioners and administrations.

Malta implements the National Spatial Data Infrastructure²⁰

The **Malta Information Technology Agency (MITA) implemented the Malta Spatial Data Infrastructure (MSDI) portal aiming at sharing environmental-related geospatial datasets, by using mostly open source software.** It is part of the INSPIRE Directive infrastructure and offers web services to the general public, public service and public sector organisations. These organisations can use the services to provide their spatial datasets to the public. The Development Planning Act is the Maltese legislation transposing the INSPIRE Directive.

In order to ensure that the spatial data infrastructures of the MSs are compatible and usable in a Community and trans-boundary context, the Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas, including metadata, data specifications, network services and data and service sharing.

¹⁹ Source: <https://joinup.ec.europa.eu/community/nifo/case/italy-facilitates-access-public-data-through-portals> (last consulted on 24/05/2017)

²⁰ Source: <https://joinup.ec.europa.eu/community/nifo/case/malta%20%80%99s-spatial-infrastructure-portal> (last consulted on 24/05/2017)



Luxembourg achieves interoperability by launching PROMETA, the organisational IF for eService design in Luxembourg²¹

The **Business Process Management Office (BPMO)** of the **Luxembourg State IT Centre** (CTIE – Centre des technologies de l'information de l'Etat) **has implemented its organisational interoperability by achieving the efficiency of eGovernment services and administrative simplification.** This is ensured thanks to BPMO's centralised approach based on defining business process standards, governance and a common framework – PROMETA. The BPMO accompanies administrations and public bodies in their business process management and optimisation of their organisation. Its role is to provide support, training and coaching, and also to deliver to and support IT projects for PAs with a business process management deployment approach. This process-based work is achieved both internally to an administration and between administrations, thanks to the common process description and workflows of the PROMETA framework.

The Croatian Government Committee for Coordination of the Implementation of ICT in the Public Sector sets up a public register, in line with the Strategy of eCroatia 2020

The Directorate for e-Croatia has set up a public register **Metaregister** as a collaborative tool for integration and development of the system of public registers. Presented as a collaboration tool for the development of the interconnection system of public registers, **Metaregister** ensures coordination within the change in the registration system while helping to maintain referential integrity. The central interoperability system comprises the **Metaregister** as the foundation for **interconnecting public registers.**

²¹ Source: <https://joinup.ec.europa.eu/community/nifo/case/prometa-organisational-interoperability-framework-eservice-design-luxembourg> (last consulted on 24/05/2017)





2.3 NIF Monitoring and Trend Analysis

45%

The overall NIF Monitoring is significantly higher than the overall average of NIF Monitoring for 2015 (35%)

The overall average of the NIF monitoring level for 2016 is 45% with 9 countries scoring over 50% and 3 of these scoring over 80%:

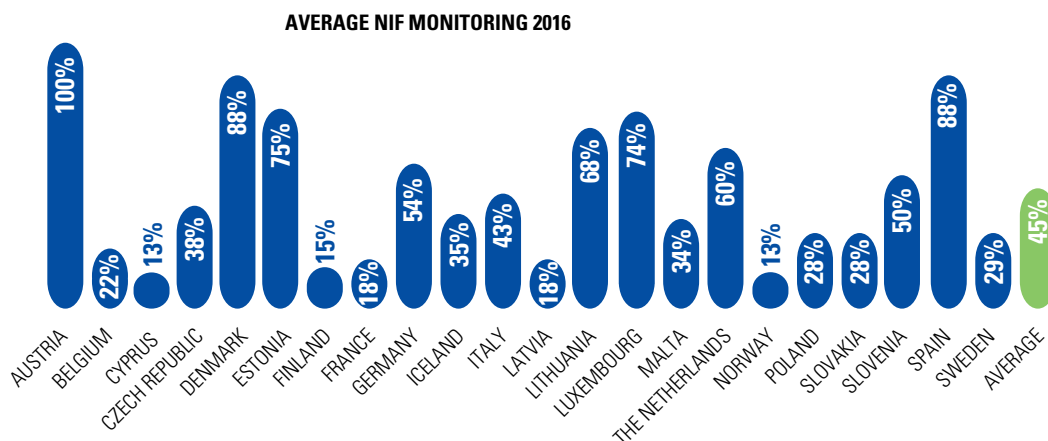


Figure 8 Average NIF Monitoring, 2016

The overall average of NIF monitoring for 2016 is increasing compared to last year (45% versus 35%), showing that there is a general improvement among the participating countries.

The type of **monitoring approach influences the results**, indeed, countries that have introduced a large-scale and organised monitoring of the NIF show a higher percentage. This is the case when a dedicated body is entrusted with the monitoring of all aspects of a NIF. Many countries organise their monitoring independently from the NIF of interoperability governance, which results in a less systematic approach and in a lower score.

The **Spanish Ministry of Finance and Public Administration** monitors the implementation of the National Interoperability Scheme. The General State Administration (AGE) has made significant adjustments in organisational and technical interoperability, infrastructure and services, common communications and electronic signatures.²²

Slovenian monitoring procedure is provided by the project coordination and the Council for the Development of IT in the PA. Indeed, the monitoring is based on a new (2015–2020) strategy

²² Source: <http://dataobsae.administracionelectronica.gob.es/cmobsae3/dashboard/Dashboard.action> (last consulted on 24/05/2017)

for PA, a 2-year-action plan, in which there are several bases of open data published on the open data portal. In addition, Slovenia ensures its transparency principle by safeguarding that State bodies and local authorities are obliged to prepare an annual report on the implementation of the Law on Access to Public Information Act for the previous year and forward it to the Ministry of PA.

The monitoring process of the **Czech Republic** is still under definition. Currently there is a process of reporting to the Government on the Action Plan for Digital Agenda implementation.

After implementing the Federal Service Bus, **Belgium** appointed it to monitor the exchange of personal data between administrations whose permissions must be obtained from the privacy commission, stating the purpose. This ensures the security and privacy principle.

Also, **Belgium** oversees that Federal websites are not launched unless they respect the multilingualism principle, *i.e.* they are at least available in Dutch and French, and administrations keep the translations in sync; the same goes for custom software components such as eID.

In **Sweden**, change management processes to ensure continuous service delivery is monitored by the Swedish National Financial Management Authority when it comes to a large selection of central government authorities.

The **Polish** Council of Ministers adopted the revised National Integrated Informatisation Programme (NPII). It features a detailed Action Plan of the Minister of Digital Affairs (PD MC) which provides for measures in order to deliver in 8 priority areas: RP Portal, Digital ID, National Registers System, Electronic Documentation Management, Data and Service Integration Platform, Integrated Analytical Platform, Common National IT Infrastructure, Open Data.

NPII's coordination mechanism is to be based on the concept of the Chief Information Officer (already introduced). The CIO is in fact a set of rules governing state informatisation, with the Ministry of Digital Affairs in charge of that process and clearly defined roles for other stakeholders. It is based on principles of re-use, shared resources, integration of systems, standardisation and seeks cost reduction of provision and maintenance of IT systems.

The NPII's monitoring mechanism: the Minister of Digital Affairs has been made responsible for monitoring of the programme. Apart from a number of performance indicators that were proposed, the minister has also been scrutinising the overall progress of the projects and emerging risks, that have to be reported to the Council of Ministers for Digitisation for evaluation and further guidance.

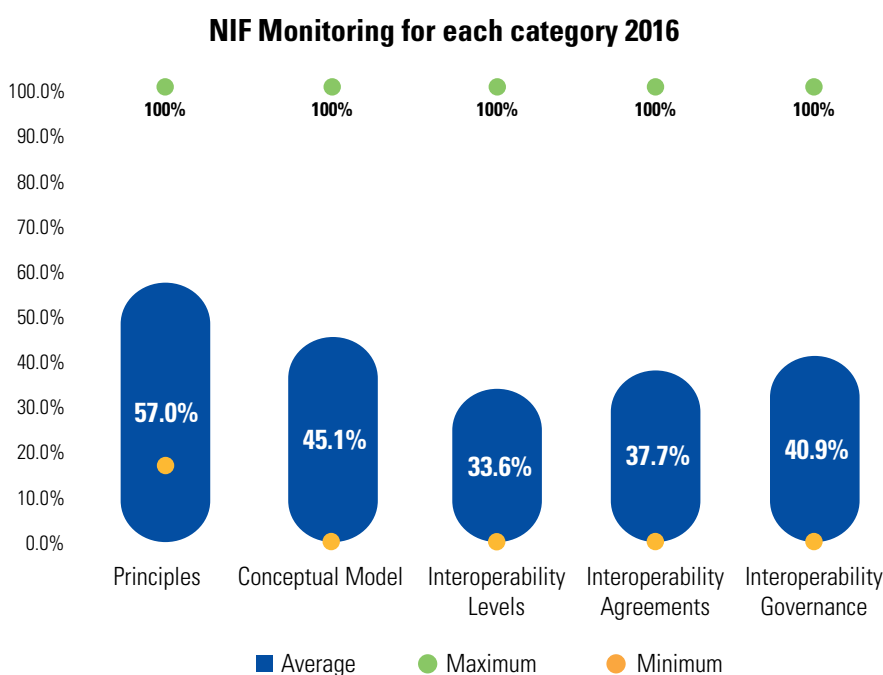


Figure 9 NIF Monitoring for each dimension, 2016

All dimensions reach 100% monitoring by at least one country. The case of **Austria** is exceptional for it scores a 100% value for all 5 dimensions, the same outstanding performance as in 2015. The **Principles**

dimension is the most EIF monitored dimension with a score of 57%. This is in line with the fact that the Principles dimension is also the most implemented one, as shown in Figure 10. There is the same scenario as in the implementation phase, **Interoperability Levels** is the dimension where there has been the most significant improvement compared with 2015. Indeed, this dimension enjoys a relative percentage increase of 59.5% going from an average of 21.1% in 2015 to 33.6% in 2016.

Overall there is a promising increase in each of the 5 dimensions: an overall average increase of 23% (mainly Conceptual Model increased by 36.4%, Interoperability Agreements increased by 43.4% and Interoperability Governance, by 41.3%).

The difference between lowest and highest scores is reflected by the different levels of maturity of the NIFs in the countries assessed here.

Furthermore, it is worth mentioning that when looking at 2015 values, the only dimension in which countries score more than 0% compared with the other 5 dimensions is Principles. Indeed, in 2015 all these MSs score 0% in all dimensions except in Principles: **Cyprus** (12,5%), **Iceland** (8,3%), **Lithuania** (87,5%), **Luxembourg** (29,2%) and **Poland** (8,3%). This shows therefore that it is the first dimension any country focuses on when implementing a monitoring plan.

Bulgaria and **Portugal** as well as the newcomers **Croatia** and **Ireland** participated in the 2016 NIFO exercise providing data for alignment and implementation but not for monitoring.

2.3.1 NIF Monitoring Evolution

Figure 10 below shows a figurative representation of the whole evolution of the dimension monitoring from 2013 to 2016:

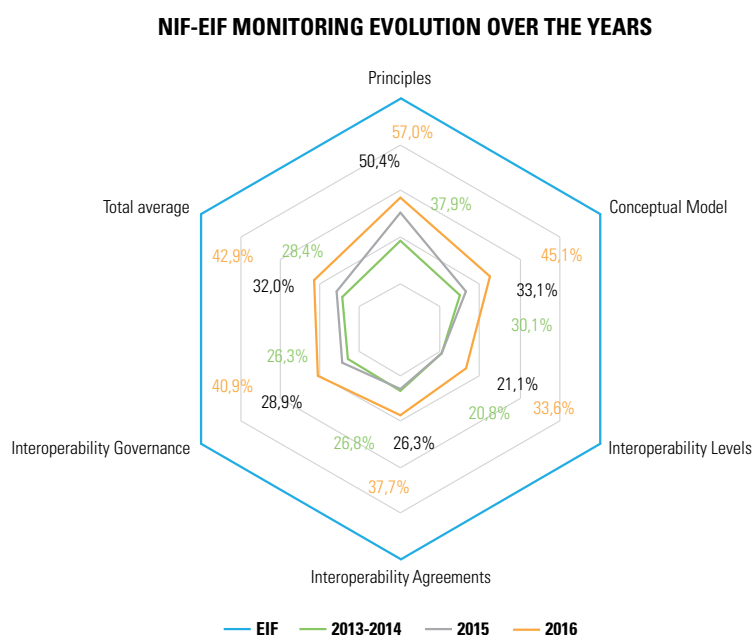


Figure 10 NIF Monitoring evolution over the years

The **overall average NIF monitoring of the 22 MSs assessed increased by 10.9%** in absolute value and by 38.7% in percentage increase from the previous exercise (2015) to the current exercise (2016).

This represents a very substantial increase in overall monitoring of MS' NIFs with the EIF, considering that it has been only 2 years that the monitoring phase has been assessed on its own without being combined with the implementation phase.

There has been **a moderate increase in the distribution of NIF monitoring in MSs according to the EIF over the years (2013–2014, 2015, and 2016).**

Countries that significantly increased their score, meaning they succeeded in strengthening their NIF monitoring according to the EIF are: **Denmark** which had an outstanding percentage increase of 50% rising from a monitoring average of 59% in 2015 to one of 88% in 2016; likewise **Lithuania** increased its overall average monitoring by 37% in absolute value between 2015 (31%) to 2016 (68%), **Luxembourg** that increased by 63% in absolute value between 2015 (10%) and 2016 (74%), and **Slovenia** that increased by 28% in absolute value between 2015 (22%) and 2016 (50%).

In **Luxembourg**, Web accessibility is a mandatory principle for which control is embedded into project processes and quality assurance processes. It is tested before the go-live of the applications and websites. Also, with regard to the transparency principle there is a project management methodology (Quapital – initiation and closing project phases) and Renow.lu, assessment and monitoring of this principle is performed.

The following countries have maintained the score of last year: **Estonia** (overall monitoring average of 75%), **Germany** (54%), **Malta** (34%), **The Netherlands** (60%), and **Norway** (13%).

The NIFO community from the JoinUp.eu platform, can be used to enable a “collaborative-oriented” approach among countries in finding solutions and in sharing best practices and ideas should they request clarifications on the NIF-EIF Alignment and NIF Implementation and Monitoring. This complete list of best practices can be found on the following JoinUp.eu websites:

<https://joinup.ec.europa.eu/collection/nifo/document/nifo-alignment-examples>

<https://joinup.ec.europa.eu/collection/nifo/document/nifo-implementation-and-monitoring-examples>

Lithuania offers **Signa Web**, which is a service dedicated to creating and validating signed electronic documents, the format conforms to the “Specification ADOC-V1.0 of the Electronic Document Signed by Electronic Signature”, approved by the Lithuanian Archives Department.

In 2009, 2 electronic document storage sites in Vilnius and Šiauliai were equipped with the Electronic Archive Information System (E AIS), where long-term validated e-documents are stored. Moreover, there is an e-service available for transferring eDocuments to an Electronic Archive Information System for long-term preservation. Every year, each institution has their eDocuments archived. **The national archive authority monitors if everything regarding the archiving follows the law and the chief archivist staff regulations.**

The Czech Republic encourages access and control mechanisms in order to ensure compliance to security and privacy legislation by monitoring through the implemented processes of access control. The Chief Architect of the eGovernment department has a mandate to approve ICT projects related to PA above a certain budget – one of the criteria is their re-use of the JIP/KAAS solution.

Iceland – ICEPRO is mandated to build up, implement and monitor the evolution of the national NIF for the period 2017–2020.²³

Iceland is moving on monitoring its NIF (a large-scale and systematic monitoring mechanism is deployed) for the period 2017–2020, which represents great progress considering its score in 2015 (8,3% in Principles, the rest being at 0%).

The Iceland Ministry of Finance and Economic Affairs mandated **ICEPRO** (the Icelandic Committee on Trade Procedures and e-Commerce) to **build up, implement and monitor the evolution of the NIF in Iceland and thus to implement a new mechanism to foster systematic and largescale implementation of interoperable solutions.**

To put this into practice, a group of around 20 key IT specialists from all the key public institutes and ministries has been created to consult ICEPRO and the ministry in evaluating the standards and norms to be documented into the Icelandic NIF and therefore used in developing the public e-service in the country. This will facilitate the e-commerce, transparency and user-friendliness linked to e-government procedures and criteria.

Consequently, this expert group will pinpoint key projects already functioning for which interoperability can be assessed, **the goal being to have all e-Government projects monitored in relation to the NIF over the coming years.** As from 2017, all public sector projects will be monitored using national and/or European interoperability as the evaluation grid.

In **Luxembourg**, ILNAS (Institut Luxembourgeois de la Normalisation, de l'Accréditation, de la Sécurité et Qualité des Produits et Services) is responsible for the certification, the supervision and the monitoring of the companies offering preservation services compliant with the new legislation.

While the aforementioned project ensures the preservation of the information principle, the one below safeguards that the reusability principle is preserved.

Maximising reuse has been part of the core policies in the field of IT & eGovernment in Luxembourg for years now. Identification of potential reuse of an existing solution (or by slightly completing or amending an existing solution) is systematically performed at the start of a new project. So, through this systematic portfolio management of all projects at the Centre des technologies de l'information de l'État (CTIE) and through the central validation procedure of new projects at CTIE, reusability is monitored.

²³ Source: <https://joinup.ec.europa.eu/community/nifo/news/iceland-goes-deeper-its-nif-development-and-monitoring> (last consulted on 24/05/2017)





2.4 Technology trends

This chapter summarises some of the emerging technology trends concerning interoperability initiatives that have been identified as “technology trends” from the aggregated analysis of the NIFO AM during all the past NIFO exercises. These technology trends should be shared among MSs in order to understand the innovative technologies in use by other countries and for leverage on existing expertise and initiatives.



Open Data and Open Technologies



Cyber Security



Cloud Computing



Social Media



Mobile technologies



Big Data and Analytics

For each technology trend, a brief overview of the main characteristics and some examples of implementation of these technologies by the MSs are presented.

Looking at Europe today, it is clear that European citizens are wellconnected, businesses that use ICT have generally improved their performance, and growth of the ICT sector has been reasonably strong in the past 2 decades. However, Europe’s infrastructure looks unfit to cope with future demands from the next wave in ICT, especially the increase of Mobile technologies and the use of Big Data and Analytics, Cloud Computing and most other emerging technologies (e.g. IoT, Cognitive Computing, High Performance Computing, etc.).



2.4.1 Open Data and Open Technologies

Open data and open technologies in general are another increasing technology trend among MSs.

The term “Open Data” refers to government data opened up for the public to use in their own applications. Looking at the NIFO AM, many initiatives are in place in Europe for sharing eGovernment information. Whereas the term “Open Technology” typically includes open source, meaning computer software with its source code made available with a licence, and open standards, meaning accepted international standards.

- The Open Data Initiative is a key part of public service reform activities in the newcomer **Ireland**. It is closely aligned with the Public Service Reform Plan, the Public Service ICT Strategy, and the Civil Service Renewal Plan. It is also central to Ireland’s participation in the Open Government Partnership (OGP);
- **France**, as an additional example, has appointed a Chief Data Officer who ensures open data reaches its full potential in improving government services. France aims to enhance evaluation of government policies, increase government openness and boost research and innovation. Moreover the Inter-ministerial open data portal, data.gouv.fr coordinates government actions aimed at inventorying, governing, producing, circulating and using government data;
- **Luxembourg** has been using open standards for some time in many domains: HTML et CSS from W3C, WCAG 2.0, web services based on open standards, ISO 13407, ISO standards controlled vocabularies (countries, languages...), etc. Since mid-2015, an “Open data” portal (data.public.lu) has been online and publishes data in open formats. The reuse of this data is allowed.

Launched by the Finnish Ministry of Finance in 2013, **Finland** has implemented an **Open Data Programme** that **eliminates obstacles to Finnish public data reuse** as well as creates the preconditions for open data within the Finnish PA. In Finland, diverse information resources are provided as open data, from geodata to weather, climate, sea, soil related, transport, financial, statistical and cultural data. Also, a growing number of municipalities are opening up their data. Such data were not interoperable in terms of their content or technical aspects, and need to be standardised. For some government agencies selling their data has also been a source of income. Therefore, the opening up of information resources has been prepared as a part of the planning of the central government spending limits and the general government fiscal plan of Finland. Ministries, government agencies, municipalities, enterprises, NGO's, various organisations, and citizen bodies have been involved in the implementation of the Open Data programme.

The final objective is to achieve data re-use as extensively and quickly as possible, in case there are no restrictions in the legislation.





2.4.2 Cybersecurity

Cybersecurity is increasingly one of the main priorities of governments which are improving their eServices to citizens and businesses. Cybersecurity incorporates a body of technologies, processes and practices designed to protect networks, computers, programmes and data from attack, damage or unauthorised access.

- Most of the MSs are regularly putting in place dedicated initiatives and actions in relation to the “Security and privacy” principle of the EIF.
- **Poland**, for example, has drafted and publicly consulted a new cybersecurity strategy for the period 2016–2020. It will be finally adopted by the Council of Ministers in mid-2017 while the National Cybersecurity Centre was created in July 2016. In parallel, the Cyberspace Protection Policy of The Republic of Poland – now binding will be revised in the course of 2017.
- At the beginning of 2016, the Government of the Republic of **Slovenia** adopted a long-term strategy on development of the information society, the objectives of which are targeted at a secure digital future, including a secure cyberspace ensuring high-level protection of personal data and communication privacy in a digital society of ubiquitous internet. This initiative aims at creating trust and confidence in digitalisation and cyberspace.
- Security and privacy are among the most important principles of national eGovernment in the **Czech Republic**: in 2015 the “Cyber Security Regulation” entered into force together with implementing regulations on Security Measures and Cyber Security Incidents and on criteria for determination of the elements of the critical Infrastructure.



2.4.3 Cloud Computing

Cloud Computing, according to the ISO/IEC 17788 and NIST definition, is a paradigm for convenient enabling network access to a scalable and elastic pool of sharable physical or virtual resources (e.g. networks, servers, storage, applications, and services) with rapid self-service provisioning and administration on-demand and released with minimal management effort or service provider interaction. The Cloud Computing paradigm is composed of key characteristics, Cloud Computing roles and activities, Cloud capability types and Cloud service categories, Cloud deployment models and Cloud Computing crosscutting aspects.

- In the context of their new National e-Government concept, **Slovakia** has built a Specialised Municipal Data Centre (MDC) serving as a platform for self-government authorities and

selfgoverning regions, providing the necessary applications with an “as a service” Cloud Computing paradigm (Government Cloud).

- In **Sweden**, the Swedish Government Agency for Innovation Systems (Vinnova), invested €380,000 to develop a platform for public e-services, hosting about ten e-government services delivered through the Cloud and offering services that can be used by all municipalities. It is interesting to note that one of these municipal services is ‘Fixa min gata’, the Swedish equivalent of Britain’s FixMyStreet. It reuses the open source code of the British solution.
- The **Estonian** Information Society Strategy 2020 Operational Plan 2014–2015 mentions as an objective: “To avoid duplication and increase the cost-effectiveness of technologies and promote data reuse of common technologies and promote the sharing of ICT infrastructure in the public sector, thereby taking advantage of Cloud technology options”.



2.4.4 Social Media

Social media is the collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are among the different types of social media. Public sector organisations worldwide are engaging with social media as part of a growing e-government agenda. Below are a few examples of how MSs use various social media for transparency purposes or to engage citizens and businesses in e-Participation initiatives.

- **Malta** National Digital Economy Strategy states that “Government is committed to be transparent, and to encourage public engagement. Online engagement will increase the use of digital technologies such as social media and crowd-sourcing, soliciting contributions from many. Communications and eParticipation activities will be designed to promote better development of public policy, increase public trust and encourage citizens and businesses to collaborate with government.”
- To meet the needs of citizens, in **Sweden** the authorities and other public organisations can provide services so that they are easily available on the digital channels of choice, in the citizens ‘digital room’ and environments, including social media. This approach can allow greater transparency and citizens can follow for example the administrative process and the status. For this purpose, dedicated “Guidelines for agencies’ use of social media” have been developed. Moreover in the new e-society remote conferencing could take place through various digital channels: smart phones, touchpads, on social media, on public and private web portals, on agency-specific websites, as well as through future, today unknown client platforms.



2.4.5 Mobile Technologies

m-Government has emerged as a natural spin-off expression of e-Government in the era of technological development (the supporting “mobile” systems) and its societal evolution (being mobile as a must). In fact, nowadays, Mobile Technologies are key enablers both for citizens and businesses and being “mobile”, or simply enabled to use mobility options, thanks to adequate infrastructure, devices and skills, is generally associated with a positive, dynamic and seemingly indispensable form of lifestyle as well as productive behaviour. This technological trend has also developed in the EU public sector, with some relevant examples described below.

- In the context of the **Lithuanian** State Information Resources Interoperability Platform (SIRIP) specification and of the “User-Centricity” underlying principle of the EIF, specific requirements for user-friendliness and multi-channel (for example availability on mobile phones) were presented.
- In **Spain**, the Ministry of Finance and Public Function has developed an application for mobile devices eAdmon “@dministración, all services in your hand” which offers an environment of userfriendly administrative resources available on social networks, providing continuous dialogue with society whenever citizens and companies wish. The application also provides citizens and businesses with services oriented to life in mobility developed by ministries and public bodies.
- **Portugal** has developed the “ChaveMóvel Digital” as an alternative means to authenticate and access public services on portals and websites of public and private entities using mobile phones or email.



2.4.6 Big Data and Analytics

The term “Big Data”, according to the market analyst Gartner, is high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision-making, insight discovery and process optimisation.

The widespread adoption of Big Data and Analytics technologies, outside of high-performance computing (HPC), has only just begun, but emerging trends suggest the development of a fast-growing market that is expected to accelerate rapidly. Whether it includes geographical information, weather data, statistics, research data, energy consumption data, transport data or health data, the notion of Big Data surely leads our DSM to innovations in technology, development of new tools and new skills. An efficient monitoring and analysis of Big Data results in opportunities also for more traditional sectors such as transport, manufacturing, food security or health.

- **Slovenia** systematically centralises the State's key information infrastructure, using an updated Cloud Computing technology, thus making solutions accessible to a practically unlimited range of users, and opening up public data. This enables the use of Big Data which are considered essential in terms of understanding and wise management of complex social systems and can also increase the effectiveness of managing energy systems, public finances, the economy, agriculture and can provide support in many other domains.
- **Malta's** National Digital Economy Strategy specifically focuses on Open Government Data and on the adoption of Big Data technologies to allow complex data to be processed, improving decisionmaking in critical areas such as finance, healthcare, transport, utilities and the environment.

2.5 Towards a new EIF

An assessment of needs and problems related to the EIF was made through interviews, exchanges and specific consultations²⁴ (please add footnote and hyperlink to the page on public and targeted consultations:

The following needs were mentioned:

- Align the EIF with new technological trends and EU strategies, in particular the Digital Single Market Strategy;
- Provide practical and more targeted guidance on how to implement interoperability requirements;
- Clarify and adapt existing EIF principles and recommendations;

Some barriers/problems were also underlined as:

- The lack of resources (financial and human) for implementing interoperability;
- The absence of a single binding policy on interoperability across sectors;
- The lack of monitoring of how interoperability initiatives are implemented;

The main problems impeding the implementation of the current EIF in Europe remains the cross-organisation barriers among public administrations at EU and national levels and the lack of centralised interoperability governance and coordination at national level.

Despite the challenge that some Member States do not adhere to interoperability requirements, most Member States consider the principles, recommendations and interoperability requirements contained in the existing EIF, either fully or partially, when launching a new ICT project.

²⁴ Source: https://ec.europa.eu/isa2/consultations/results/result_impact-assessment-for-the-revision-of-the-eis-eifl_en (last consulted on 24/05/2017)



3

Conclusion

One of the ten priorities of the EC under the Juncker Presidency lies in removing barriers to achieve an EU Digital Single Market in Europe, which the process of NIF-EIF alignment, implementation and monitoring significantly contributes to realising. In this context, Member States are undertaking several reforms in order to digitise their public administrations to save time and cost, increase transparency, ensure better data quality and improve the delivery of their public services. Nevertheless, the 2016 Digital Economy and Society Index for eGovernment²⁵ shows that there is still a great potential for further improvement of digital public services. In order to interconnect national public services with each other while reaching beyond their national borders to interconnect with similar services at EU level, the most effective key enabler is the wide use of interoperability.

The DSM Strategy for Europe²⁶, adopted by the Commission on 6 May 2015, recognises interoperability as a prerequisite for a digitally interconnected Union and calls for the revision and extension of the existing EIF. This **digital transformation through the use of interoperability** allows heterogeneous administrative entities to exchange electronically, amongst themselves and with citizens and businesses, meaningful information in ways understandable by all parties. **Now, building on this success, both versions of the aforementioned Strategy and Framework have been updated and extended and will offer a better alignment with existing EU policies, an extension and alignment with emerging trends and a major focus on EIF implementation.**

Both initially the **Interoperability Solutions for European Public Administrations (ISA) programme (2010–2015) and, subsequently, its follow-up ISA² programme (2016–2020)**, represent the main instruments to implement the new version of the EIS and EIF through a portfolio of updated actions focused on improving digital collaboration between public administrations in Europe.

²⁵ Source: <https://ec.europa.eu/digital-single-market/en/desi> (last consulted on 24/05/2017)

²⁶ COM (2015) 192 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – A Digital Single Market Strategy for Europe, Brussels, 06.05.2015

The 47 interoperability recommendations and the 12 underlying principles included in the new EIF will help public administrations to design and deliver seamless European public services to businesses and citizens, which are digital-by-default, cross-border-by-default and open-by-default; to design and update their NIFs, or national policies, strategies and guidelines promoting interoperability; and, finally, to contribute to the establishment of the DSM by fostering cross-border and cross-sectoral interoperability for the delivery of European digital public services.

Similarly, the EIF Implementation Strategy (EIF-IS), representing an **interoperability strategy**, will specifically tackle five themes of interoperability-related challenges (two of which are political, one is economic, two are socio-cultural, three are techno-cultural and two are legal). These five themes will:

- Facilitate in translating **political willingness into concrete initiatives and measurable goals**;
- **Identify, disseminate good practices and support the establishment of governance and coordination bodies and processes**;
- **Provide practical tools and guidance** to the EU Member States in order to identify, prioritise and evaluate the best investments opportunities in the interoperability domain;
- **Provide strength to existing coordination mechanisms** to better communication among public administrations at national and EU level;
- **Provide support on the improvement and development of cross-border public services** based on the interoperability requirements and principles set in the EIF;
- **Consider new technologies for interoperability initiatives and communicate on the advantages of replacing legacy systems**;
- **Provide support for the development of key interoperability enablers**;
- Ensure that **all interoperability requirements defined are in line with the EIF**;
- Better identify **legal barriers**.

Within the EIF Implementation Strategy (EIF-IS), **five main strategic focus areas** expand on a list of 22 different actions with the aim of fully complying with the interoperability priorities at national and EU levels:

- Ensure governance, coordination and sharing of interoperability initiatives
- Develop organisational interoperability solutions
- Engage stakeholders and raise awareness on interoperability
- Develop, maintain and promote key interoperability enablers
- Develop, maintain and promote interoperability supporting instruments

The 22 individual actions **will ensure that the new version of the EIF (described below) will be able to achieve its ultimate objective of supporting the delivery of interoperable end-to-end user-centric digital public services in the Union.** In addition, the EC ensures that support related to the implementation and monitoring of the new EIF will be provided to the Member States through a wide range of financial instruments such as ISA², Horizon 2020, Connecting Europe Facility, European Structural and Investment Funds (ESIF), Structural Reform Support Programme (SRSP) and INTERREG Europe.

The revised version of the EIF puts more emphasis on how interoperability principles and models ought to apply in practice, while taking into account emerging policy-related and technological needs.

In order to achieve this, the number of **proposed recommendations increases from 25 to 47** and were altered in a way to make them **more concrete for implementation.** The new version of the EIF strongly strives to exercise a stronger focus on openness and information management, data portability, interoperability governance and integrated service delivery. This updated EIF will run on this following vision fully endorsed by the consulted representatives of the Member States to the ISA² programme, public administrations and other feedback from a wide range of stakeholders (EU officials, EU Member States, Academia). The Commission has updated the 12 underlying principles that the original EIF had set out: underlying principles that do not only support EU public services (subsidiary and proportionality, user-centricity, multilingualism, etc.) but also form the foundation for all the strategy's vision, strategic focus areas and actions.

Figure 11 provides an overview of the new EIF elements:

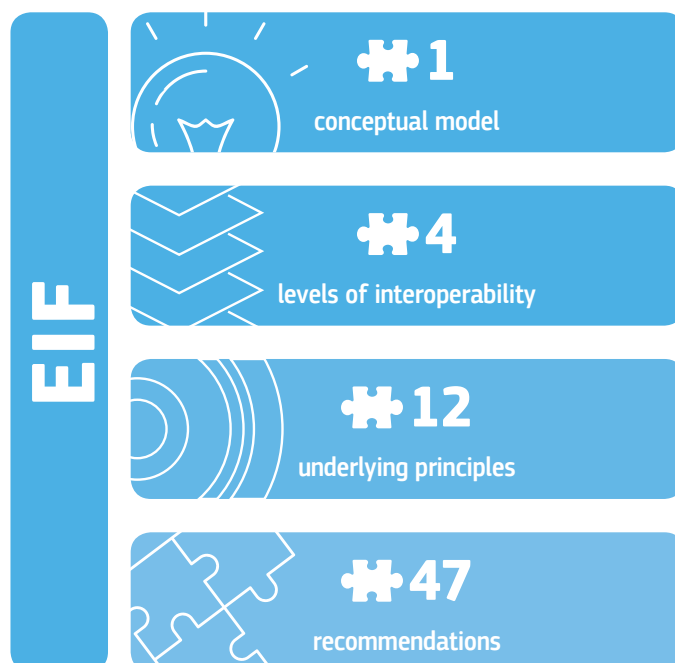


Figure 11 New EIF v3.0 Elements

Finally, a **new operating model of the observatory** on the modernisation of public administrations, eGovernment and interoperability is about to replace the current NIFO. The new version of NIFO will revise its approach guidelines, methodologies and other instruments based on the new EIF and interoperability action plan, while continuing to monitor the status of interoperability in Europe. The new observatory will require a review of the approaches to monitoring and evaluating eGovernment and interoperability initiatives at EU and national levels. One of the main innovative features of this new observatory lies in the fact that policy-makers and practitioners will be able to find complete information on the extent to which Member States' administrations are using interoperability solutions provided by the European Institutions, in order to stimulate more informed decision-making processes, based on both qualitative and quantitative data.



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