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Table of Contents

INTRO	DUCTION	5
1. IN	TEROPERABILITY	6
1.1.	What are the Main Benefits of Interoperability	6
2. W	HAT IS THE EIF?	7
2.1.	EIF GLOSSARY	7
2.2.	NATURE OF THE INSTRUMENT	7
2.3.	INTERNAL LOGIC OF THE EIF	8
3. W	HAT ARE THE COMPONENTS OF THE EIF	10
3.1.	PRINCIPLES	10
3.2.	INTEROPERABILITY LEVELS	11
3.3.	CONCEPTUAL MODEL	13
4. H	OW DOES THE EIF OPERATE?	15
4.1.	THE ROLE OF RECOMMENDATIONS	15
4.2.	INTERACTION WITH NATIONAL PUBLIC ADMINISTRATIONS (NIFS AND DIFS)	16
5. EI	F IMPLEMENTATION	18
	Table of Figures	
Figure	1 EIF Glossary Screenshot	7
Figure	2 Internal Logic of the EIF	9
Figure	3 Interoperability Layers of the EIF	12
Figure	4 Conceptual Model of the EIF	13
Figure	5 EIF Components providing Recommendations	15
Figure	6 Relationship between EIF, NIFs and DIFs	16
Figure	7 Solutions to get to know the EIF	19
Figure	8 Solutions to implement the EIF	20

Introduction

In the pursuit of an integrated common market, the EU has endeavoured to develop and promote the formation of a Digital Single Market. The European Digital Single Market can only function if supported by common policies that enable interconnected, interoperable networks and systems. A greater interconnectedness helps a greater number of European citizens and businesses work, relocate and operate in other EU Member States. This calls for an increased ability to interact with public administrations across borders.

To make these interactions efficient and effective, Member States ought to modernise their Public Sectors. The modernisation of Public Administrations should not lead to the raising of new barriers at the national level but leverage instead the use of technology to bring about an ever-closer union. For these purposes, efforts to digitise the public sector should be coordinated at the European level to avoid the digital fragmentation of services and help the EU's digital single market become a reality.

The European Interoperability Framework (EIF) has been conceived for these purposes. The EIF gives guidance to Member States on how to improve the governance of their interoperability activities, establish cross-organisational relationships, streamline processes and support the development of end-to-end digital services. The present EIF Guideline aims to provide a user-friendly guide for Member States on how to read the EIF; explain how to find EIF documentation; understand the logic behind the EIF and how it can contribute to improving and implementing the interoperability of public administrations in Europe.

1.Interoperability

<u>Definition:</u> for the purpose of the EIF, interoperability is the ability of organisations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between different organisations, through the business processes they support, by means of the exchange of data between their ICT systems.

Promoting interoperability within the EU will require the provision of interoperable user-centric solutions that are compatible throughout the jurisdiction of the Digital Single Market, which in turn will enable the design, creation and provision of digital public services across borders and sectors. The current version of the EIF aims to develop this type of interoperability at the European level.

1.1. What are the Main Benefits of Interoperability

Interoperability can lead to extensive benefits at the national level, but the fulfilment of interoperability at a European level has the potential to bring a new dimension of benefits to citizens, businesses and contribute extensively to the prosperity of Europe.

One of the chief benefits of achieving interoperability at the European level would be to allow citizens and businesses to benefit from interoperable user-centric digital public services, at national and EU levels. At the European level, the promotion of interoperability would indirectly lead to the modernisation of the public sectors in Member States, in order to become prepared to be able to receive and transmit the data underpinning systems and services from other EU countries. Moreover, interoperability would lead to greater economic growth due to increased government efficiency, reduced administrative burdens and costs for citizens and businesses. The lack of interoperability, on the other hand, constitutes a major obstacle to the formation of a digital single market.

2. What is the EIF?

2.1. EIF Glossary

Interoperability at the European level requires a common understanding among public administrations about the key terms and concepts used when implementing European Public Services.

To this end, the Interoperability unit of the European Commission has conceived a comprehensive EIF glossary, which helps European States' public administrations navigate the different terminologies, tools and concepts that are needed to implement the EIF. Moreover, the EIF Glossary extensively covers the most frequently used terms mentioned in the EIF and provide clear descriptions explaining these. At the same-time, the EIF glossary helps promote a common understanding of interoperability among the competent stakeholders in Europe. Moreover, it contributes to developing a unique European understanding of interoperability and how it can be practiced across borders and sectors. Please see an example of the EIF Glossary here below:

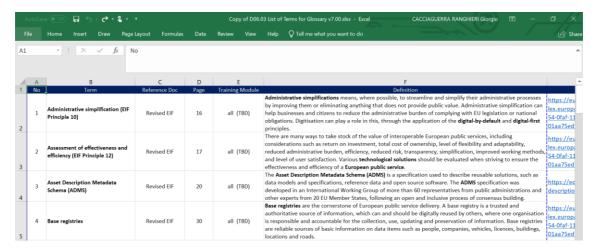


Figure 1 EIF Glossary Screenshot

Source: EIF Glossary, Wavestone

2.2. Nature of the Instrument

The EIF is addressed to all practitioners involved in defining, designing, developing and delivering European public services. The main purpose of the EIF is to help European public administrations design and deliver public services to other public administrations, citizens and businesses in Europe, which are provided via digital channels (digital-by-default), accessible for all citizens in the EU (cross-border by-default) and enabling reuse, participation/access and transparency (open-by-default).

The EIF is the guiding principle for the fulfilment of the ISA² Programme¹. In addition, the fulfilment of the EIF contributes more widely to the realisation of the a) Europe 2020 Strategy², b) Digital Agenda for Europe³, c) Tallinn Declaration⁴.

The EIF is principally promoted and maintained by the ISA² programme in close cooperation between the Member States and the Commission in the spirit of Articles 26, 170 and 171 of the Treaty on the Functioning of the European Union⁵, calling for the establishment of interoperable trans-European networks.

2.3. Internal Logic of the EIF

The EIF is meant to be a generic framework applicable to all European Public Administrations. It lays out the basic conditions for achieving interoperability at different levels (European, national, regional and local), while providing a common denominator for initiatives promoting interoperability.

Moreover, the EIF provides guidance to public administrations on the design and update of National Interoperability Frameworks (NIFs) and Domain Interoperability (DIFs), which are the interoperability frameworks supporting a specific policy domain (e.g. Environmental Policy)). Indeed, the EIF provides the tools to help coordinate a Member States' different DIFs into consolidated National Domain Interoperability Frameworks that then compose their wider NIF.

The EIF also promotes interoperability as a way for public administrations to align their business processes, responsibilities and expectations and achieve commonly agreed and mutually beneficial goals. The EIF provides value in two directions:

- Bottom-up: when a NIF, aligned with the EIF, is used for the implementation of public services at all levels of national administrations, it creates the interoperability conditions for extending the scope of cross-border services;
- Top-down: when the EIF is considered in EU legislation and policy domains, through ad hoc references, it increases the interoperability potential of national actions.

The EIF document⁶ focuses its activities and recommendations across three main conceptual fields that are autonomous from each other but that jointly contribute to the implementation of the EIF and interoperability more widely. These 'building blocks' of the EIF are the **EIF principles**, the **Interoperability levels** and the **Conceptual model**. These 'building blocks' and their recommendations will be further explained in the upcoming sections of this user-guide. Overall, the internal logic within the EIF can be appreciated in Figure 2.

¹ Decision (EU) 2015/2240 (ISA2)

² EUROPE 2020, COM(2010) 2020 final, A strategy for smart, sustainable and inclusive growth

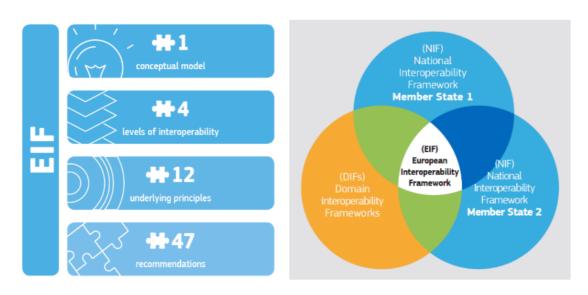
³ A Digital Agenda for Europe, COM(2010)245 final

⁴ Talinn Declaration, ministerial declaration, 2017

⁵ Consolidated version of the Treaty on the Functioning of the European Union

⁶ New EIF, Annex II, 2017

Figure 2 Internal Logic of the EIF



Source: New EIF Brochure, 2017

3. What are the components of the EIF

3.1. Principles

The interoperability principles address the behavioural aspects motivating interoperability actions. They provide a cognitive guide of the values and notions that, when implemented, contribute to the realisation of interoperable European Public Services. In particular, the EIF promotes **12 principles**, which should be applied or kept in mind by Public Administrations when designing, updating and providing new public services.

EIF Principle 1 - Subsidiarity and Proportionality

The **subsidiarity principle** requires EU decisions to be taken as closely as possible to citizens, while the **principle of proportionality** limits EU actions to what is necessary to achieve the objectives of the Treaties.

EIF Principle 2 - Openness

In the context of interoperable public services, the concept of **openness** mainly relates to data, specifications and software.

EIF Principle 3 - Transparency

Transparency in the EIF context refers to:

- Enabling visibility within administrative environment of a public administration, allowing citizens to view and understand administrative rules, processes and decision-making.
- Ensuring the **availability of interfaces** with internal information systems.
- Securing the protection of personal data, by respecting applicable legal frameworks for the large volumes of data held and managed by Public administrations.

EIF Principle 4 - Reusability

The **reusability** of IT solutions, information and data, is an enabler of interoperability as it extends operational use, as well as saving money and time.

EIF Principle 5 - Technological neutrality and data portability

To ensure **technological neutrality**, public administrations should focus on functional needs, minimise technological dependencies and avoid imposing specific technical implementations or products on their clients in order to be able to adapt to a changing technological environment. **Data portability** refers to the ability to move and reuse data easily among different applications and systems across borders.

EIF Principle 6 - User-centricity

User-centricity means putting users' needs at the centre when determining which public services should be provided and how they should be delivered. This entails providing the following functionalities in a new service:

A multi-channel service delivery approach;

- A single point of contact available to all users;
- Regular collection, assessment and implementation of user feedback.

EIF Principle 7 - Inclusion and accessibility

Inclusion is about enabling everyone to take full advantage of the opportunities offered by new technologies to access European public services. **Accessibility** ensures that people with disabilities, the elderly and other disadvantaged groups can use public services to levels comparable to those for other citizens.

EIF Principle 8 - Security and privacy

Public administrations must also guarantee the **privacy**, confidentiality, authenticity, integrity and non-repudiation of information provided by citizens and businesses, who need to confident that they interact with public authorities in a **secure** and trustworthy environment in full compliance with relevant regulations, e.g. GDPR.

EIF Principle 9 - Multilingualism

Multilingualism requires striking a balance between the expectations of citizens and businesses to be served in their own language(s) or their preferred language(s) and the ability of Member States' public administrations to offer services in all official EU languages. A suitable balance is providing European public services in the languages of the expected end-users.

EIF Principle 10 - Administrative simplification

Administrative simplification requires streamlining and simplifying administrative processes by improving them or eliminating those not providing public value. Administrative simplification helps businesses and citizens by reducing their administrative burden.

EIF Principle 11 - Preservation of information

The goal of this principle is to ensure that records and other forms of information keep their **legibility**, **reliability** and **integrity** and can be accessed as long as needed (subject to security and privacy provisions). This requires selecting formats enabling long-term accessibility, including preservation of associated electronic signatures or seals.

EIF Principle 12 - Assessment of Effectiveness and Efficiency

There are many ways to take stock of the value of interoperable European public services, such as return on investment, transparency or user satisfaction. Various **technological solutions** should thus be evaluated when striving to ensure the effectiveness and efficiency of a **European public service**.

3.2. Interoperability levels

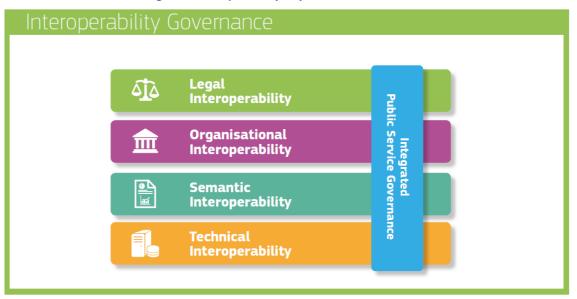
The EIF has devised a specific **interoperability model** that is applicable to all digital public services as part of the interoperability-by-design paradigm, which includes the following:

- Four layers of interoperability: legal, organisational, semantic and technical;
- A cross-cutting component of the four layers, 'integrated public service governance';

A background layer, 'interoperability governance'.

These layers are further illustrated in Figure 3:

Figure 3 Interoperability Layers of the EIF



Source: New EIF Brochure, 2017

Legal Interoperability

Legal interoperability ensures that organisations operating under different legal frameworks are able to work together. This requires ensuring that new legislation does not block the establishment of European public services between Member States and that there are clear agreements on how to deal with differences in legislation across borders. It also ensures that organisational, semantic and technical requirements mandated by law are compliant with EIF principles.

Semantic Interoperability

Semantic interoperability ensures that the precise format and meaning of exchanged data and information is preserved and understood throughout exchanges between parties, in other words 'what is sent is what is understood'. In the EIF, this covers both semantic and syntactic aspects.

Organisational Interoperability

Organisational interoperability refers to the way in which public administrations develop an understanding of each other's business processes, responsibilities and expectations to achieve commonly agreed and mutually beneficial goals. This requires the documentation and integration of business processes. Organisational interoperability also aims to meet the requirements of the user community by making services identifiable, accessible and user-focused. Organisational interoperability also provides for provisions ensuring trust between the parties exchanging information.

Technical Interoperability

Technical interoperability covers the applications and infrastructures linking systems and services. Aspects of technical interoperability include interface specifications, interconnection services, data integration services, data presentation and exchange, and secure communication protocols.

Interoperability Governance & Integrated Public Service Governance

The **integration of public services** helps agencies share their objectives across organisational boundaries, whereby information can be shared in a way that avoids data redundancy and provides citizens with high quality services. **Integrated public services** are supported in turn by **Interoperability Governance**, which relies on the establishment of the interoperability frameworks, institutional arrangements and organisational structures needed to promote interoperability at the national and EU levels.

3.3. Conceptual Model

The conceptual model of the EIF promotes the idea of 'interoperability by design', which looks at embedding interoperability functions during the design of public services. Interoperability by design, in particular, sees reusability as a driver for interoperability, whereby public services should reuse information and services that already exist. It further calls on Public Administrations to identifying, negotiating and agreeing a common approach for interconnecting public service components and making information and services retrievable in interoperable formats. This should include information from internal and external sources (see Figure 4).

Catalogues

Catalogues

Coordination for Integrated Services

Coordination Sources and Services

Information Sources
Information Sources
Services

Services

Shared Services

Shared Services

Basic Services

Figure 4 Conceptual Model of the EIF

Source: New EIF Brochure, 2017

The basic components of the conceptual model of the EIF are the following:

 'Integrated service delivery' to remove complexity for the end-user and Integrated public service governance;

- A 'no wrong door' service delivery policy, to provide alternative options and channels for service delivery, while securing the availability of digital channels (digital-by-default);
- Reuse of data and services to decrease costs and increase service quality and interoperability;
- Catalogues describing reusable services and other assets to increase the findability and usage of given services.

4. How does the EIF operate?

4.1. The role of Recommendations

The EIF's 47 recommendations provide guidance on how to ensure interoperability among digital public services, establish cross-organisational relationships, streamline processes and ensure that legislation does not affect interoperability. These recommendations are directly and specifically linked to all different components of the EIF, such as the EIF principles, the various layers of interoperability and the instruments of the conceptual model. These recommendations provide Public Administration with concrete actions they can undertake to implement the EIF and thus promote interoperability.

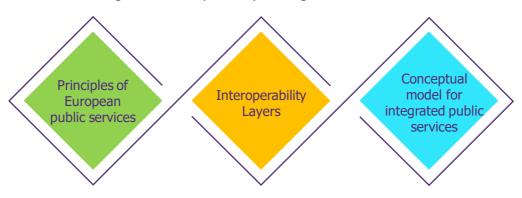


Figure 5 EIF Components providing Recommendations

Source: EIF Training Module 1, Wavestone

The following are a few examples of the type of recommendations the EIF proposes to implement the various EIF Principles, Interoperability layers and conceptual model recommendations:

- Principles of European public services: 'Simplify processes and use digital channels whenever appropriate for the delivery of European public services, to respond promptly and with high quality to users' requests and reduce the administrative burden on public administrations, businesses and citizens' Recommendation 17
- Interoperability Layers: 'Use a structured, transparent, objective and common approach to
 assessing and selecting standards and specifications. Take into account relevant EU
 recommendations and seek to make the approach consistent across borders' Recommendation 22
- Conceptual model for integrated public services: 'Develop interfaces with base registries
 and authoritative sources of information, publish the semantic and technical means and
 documentation needed for others to connect and reuse available Information' Recommendation 38

4.2. Interaction with National Public Administrations (NIFs and DIFs)

Governments need to assign resources to their interoperability efforts. The EIF aims to make this effort easier by giving clear guidance to public administrations on how the design and update national interoperability frameworks (NIFs), or national policies, strategies and guidelines promoting interoperability.

Interaction through the transposition of the EIF

Member States should enjoy sufficient freedom to develop their NIFs with respect to EIF recommendations. As Member States have different administrative and political systems, national specificities have to be taken into account when transposing the EIF into the national context. NIFs can build upon the EIF, by adding elements to make the EIF's implementation, that are compatible with their country's Public Administration. In a similar way, Domain-specific Interoperability Frameworks (DIFs), should remain compatible with the EIF to replicate the EIF interoperability requirements for the specific domain.

The EIF therefore interacts with Public Administrations by either directly providing elements onto the NIFs or DIFs or by providing elements that can be contextualised and further tailored for them. The EIF thus provides a common core of interoperability elements for the various NIFs and DIFs and can be envisaged as a 'common denominator' for the interoperability policies of Member States. This relationship between EIF, NIFs and DIFs is illustrated in Figure 6.



Figure 6 Relationship between EIF, NIFs and DIFs

Source: New EIF Brochure, 2017

Interaction through the monitoring function of the EIF

Coordination, communication and monitoring are of the utmost importance for successful governance. As common components and interoperability agreements are the results of work done by public administrations at different levels (local, regional, national and EU), coordination and monitoring

require a holistic approach. The new EIF Monitoring Mechanism will aim to help public administrations gain a greater understanding of how they can progress in the implementation of EIF. The new monitoring mechanism will interact regularly with countries' public administrations to obtain the needed metrics to provide accurate information on the state of implementation in EU states.

5.EIF Implementation

Member states can look into the National Interoperability Framework Observatory (or NIFO) to discover the latest Interoperability initiatives being implemented across Europe. Through NIFO, Member States can find policies and best practices that can help them implement the EIF more effectively. Moreover, by visiting the **NIFO Community**⁷ on Joinup, Member States can access the tools that will help them implement the EIF and further enhance the current levels of interoperability in their Public Administrations.

Among other things, the NIFO collections also include studies on the state of eGovernment in Europe, such as the **EU Semester study**⁸ series and comprehensive **Interoperability Case Studies**⁹. Moreover, NIFO is also a living community, where its 197 individual members can interact and share knowledge, as well as contacting their country's **NIF and eGovernment representatives**¹⁰, for any queries they might have on the state of interoperability or eGovernment in their respective countries.

The tools facilitating the implementation of the EIF that are available through the NIFO community can be divided into two types a) tools that help inform public administration about the content of the EIF and b) tools and solutions that help civil servants implement the EIF onto their National Interoperability Frameworks (NIFs):

a) Solutions to get to know the EIF:

- EIF Communication¹¹ with its Annex I¹² and Annex II¹³. Annex II presents the 47 recommendations of the EIF.
- The **EIF Brochure**¹⁴, outlining in detail the various components of the EIF, such as the EIF Principles, Interoperability Layers and Conceptual Model.
- The present EIF Guidelines, which give a simplified view of the various instructions and information emanating from the EIF and provide quick access to useful links for the implementation of the EIF.
- The **interoperability factsheets**¹⁵, summarising the interoperability activities of over 30 European countries.
- Consult factsheets on the state and progress of eGovernment¹⁶ for 34 countries and EU institutions.

⁷ https://joinup.ec.europa.eu/community/nifo/home

⁸ https://joinup.ec.europa.eu/news/eu-semester

 $^{^9\} https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/interoperability-case-study$

 $^{^{10}\} https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-and-egov-representatives$

¹¹ European Interoperability Framework – Implementation Strategy, COM(2017) 134 final

¹² European Interoperability Framework - Implementation Strategy, Interoperability Action Plan, Annex II, COM(2017) 134 final

¹³ European Interoperability Framework - Implementation Strategy, Annex II, COM(2017) 134 final

¹⁴ https://ec.europa.eu/isa2/sites/isa/files/eif_brochure_final.pdf

¹⁵ https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-factsheets

¹⁶ https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/egovernment-factsheets-and-infographics

- To promote a common understanding of Interoperability in Europe, a dedicated EIF Glossary
 will be made available to provide clear explanations about the main EIF concepts and tools.
- NIFO, through its monitoring activities, helps provide an accurate view of European countries' EIF implementation needs through analytics models¹⁷. This activity will be further enhanced through the launch of the New EIF Monitoring Mechanism.

Figure 7 Solutions to get to know the EIF



Source: EIF Training Module 4, Wavestone

b) Solutions to implement the EIF:

- Within the <u>Joinup</u>¹⁸ collaborative platform enabling Member States' public administrations to find and consult catalogues of solutions that can facilitate the implementation of the EIF's recommendations, and which also provide guidance on the use of specific standards.
- Analytical models¹⁹, which help show the alignment of various NIF with the EIF.
- The possibility to request ISA interoperability experts' advice when drafting the NIF²⁰ of a European country.
- From 2019, the NIFO Community will further provide access to the EIF training modules
 and the EIF Implementation Toolbox, which will equip public administrations with the
 theoretical and practical knowledge needed to align their NIF with the EIF.
- The European Interoperability Reference Architecture (EIRA) provides a metamodel defining architectural building blocks (ABBs) needed to build interoperable e-Government systems.
- A Solution Architecture Template (SAT) is also available to support the development and definition of a DIF through a set guidelines. The eProcurement SAT, in particular, provides an example of an architecture for the e-procurement domain.

 $^{^{17}\} https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-analytical-models$

¹⁸ https://joinup.ec.europa.eu/solutions

¹⁹ https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-analytical-models

²⁰ To **request assistance** from ISA expert to draft a NIF, Member States should contact the ISA unit via the ISA2@ec.europa.eu functional mailbox, requesting advice and support for this.

Figure 8 Solutions to implement the EIF

Solutions



Source: EIF Training Module 4, Wavestone