



Report on IMAPS results

2020 edition

Directorate-General for Informatics

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Executive Summary

Objective

The **Interoperability Maturity Assessment of a Public Service** (IMAPS) is a solution that helps public administrations evaluate, monitor and improve the **behavioural interoperability maturity** of their digital public services. IMAPS has been developed under the ISA2 Programme of the European Commission (Directorate-General for Informatics).

IMAPS provides public administrations with :

- An **online self-assessment tool** free of charge;
- An **interoperability maturity score and report**; and
- A **set of recommendations and good practices**, aligned with the EIF, on how to improve the interoperability maturity level of their digital public service.

This report analyses the results of IMAPS assessments that were submitted by public administrations in 2020 and presents overall trends in terms of interoperability maturity of digital public services.

Highlights

All of the digital public services assessed are on average **below the Essential interoperability level** (IMAPS maturity level 3).

The IMAPS assessments results indicate that interoperability is impacted more by **organisational, semantic and technical challenges** than by regulatory settings.

The overall maturity for the **interoperability areas** is on average below the Essential level.

While **service delivery** is on average below the Essential level in the domains of service catalogues, certification, multilingualism and accessibility, scores are above the Essential level for procedural transparency, pre-filling, data exchange and data privacy.

The interoperability maturity of **service consumption** is on average above the Essential level for the consumption/reuse of relevant services from public administrations, the score for the subscription of updates is significantly below the Essential level.

The interoperability maturity of **service management** is on average below the Essential level. While services score above the Essential level for concept definitions, services are on average below the Essential level regarding sharing and reuse, architectural framework or the specification process.

Compared with IMAPS assessment results of previous years (2017-2019), which scored overall at Essential level, the interoperability maturity of the digital public services assessed in 2020 shows lower alignment with interoperability requirements.

Method

SCOPE AND APPROACH

The IMAPS 2020 study covers 40 digital public service assessments from 8 countries (Austria, Belgium, Estonia, Greece, Italy, Slovenia, Spain and Norway).

This report is based on IMAPS assessments completed by respondents on a voluntary basis in the period **January to July 2020** (using IMAPS v1.1.1) following a series of IMAPS awareness-raising communications.

Upon a **data quality and compliance check**, only those assessment results were included in the final section for which accurate data and comprehensive information on the service assessed were available.

Given that the 2020 value distributions **only follow a normal distribution for attributes related to Service Delivery (B)**, it is suggested that the sample is only representative of the population for those and, therefore only findings for Service Delivery can be extrapolated to the population

The services assessed cover **all administrative levels**, i.e. local, regional, national, European and international. The main administrative instance of public services assessed however relates to the national level. Around half of the services are provided in a European and/or international context.

This report has been drafted and published in follow-up to the IMAPS report on the 2018 results. As such, it also includes references to the IMAPS results from previous years (2017, 2018 and 2019). Given the **limited comparability of the contributions** (e.g. different sample of types of public services assessed, different geographical coverage, etc.), this report only shows the results in a comparative view without pretending to draw general conclusions on the state of interoperability of digital public services across Europe.

INTEROPERABILITY MATURITY SCORE

IMAPS defines five levels of interoperability maturity from Ad hoc to Seamless interoperable digital public services. The digital public services assessed are overall at **Opportunistic level** if positioned on the IMAPS maturity scale (level 2). This means that the digital public service **implements some of the good practices** for interoperability.

The desired interoperability level is at least level 4 which is Sustainable. As from level 4 and upwards, the digital public service is considered to have implemented interoperability according to good or best practices.

IMAPS provides concrete recommendations on how to upscale the interoperability of a digital public service to the next level.

VIEWPOINTS OF THE ANALYSIS

Interoperability areas and attributes

IMAPS looks at the interoperability of a digital public service from **three different perspectives**:

- Service Delivery (B): delivery of the digital public service¹;
- Service Consumption (C): consumption of reusable machine-to-machine services from other public administrations and businesses. This can include the consumption of functionalities, base registry information and security services; and
- Service Management (D): controlling and monitoring the process flow related to service interactions with the external domain from trigger to outcome. This area includes service management aspects such as enterprise architecture, procurement, and service level management.

IMAPS has defined a **set of interoperability attributes** for each of the service areas:

- Service Delivery comprises 11 attributes (e.g. pre-filling, accessibility, multilingualism);
- Service Consumption consists of 3 attributes (e.g. reuse and sharing); and
- Service Management defines 8 attributes (e.g. service choreography, architectural framework).

Apart from the service area, this report looks at the average interoperability score per attribute.

Interoperability enablers and manifestations

IMAPS distinguishes between interoperability attributes that are ‘enablers’ and ‘manifestations’. An **interoperability enabler** relates to an attribute, which, when it exists or is implemented, **enables** interoperability (e.g. standard-based procurement criteria). An **interoperability manifestation** relates to an attribute, which **shows** interoperability (e.g. pre-filling of forms).

¹ The numbering of the areas (B, C, D) is based on the sections of the questionnaire. As there is a service context section (A) in the questionnaire, the numbering of the areas starts at B.

This report looks at the average interoperability score for interoperability enablers and manifestations.

EIF levels

Most of the IMAPS attributes have been derived from or intrinsically relate to the European Interoperability Framework, which includes around 50 specific recommendations on how to improve governance of public services' interoperability activities, establish cross-organisational relationships, streamline processes supporting end-to-end digital services, and ensure that both existing and new legislation do not compromise interoperability efforts.

The findings from this IMAPS study give an indication of how well the EIF is being implemented.

This report looks at the average maturity score for legal, organisational, semantic and technical interoperability and related attributes.

Conclusions

EIF IMPLEMENTATION

IMAPS attributes relate to one or more of the four levels of interoperability of the European Interoperability Framework (legal, organisational, semantic and technical interoperability). The single legal interoperability attribute on data privacy (B4) shows on average the highest maturity level, followed by semantic, technical and organisational interoperability.

This indicates that for the public services assessed, legal aspects impact the interoperability less than technical and semantic challenges or organisational settings.

INTEROPERABILITY ENABLERS AND MANIFESTATIONS

The attributes related to interoperability enablers and interoperability manifestations show a slight difference between the average maturity: interoperability manifestations exceed the maturity level of enablers.

INTEROPERABILITY AREAS

The public services assessed are on average *below* the Essential interoperability. Looking at the overall maturity of interoperability areas, services are on average below the Essential level for service delivery and management, except for service consumption.

Service delivery

The overall interoperability maturity of service delivery is on average *below* the Essential level (level 3).

IMAPS attributes related to the European Interoperability Framework (EIF) transparency and data privacy principles and pre-filling are on

average *above* the Essential level. The services assessed also score above Essential level on data exchange, user feedback and cross-border service delivery features.

The interoperability maturity of service delivery is on average *below* the Essential level in the domains of delivery channels, certification, service catalogues and accessibility. The public services assessed score lowest on multilingualism features.

The study exposed the following areas for improvement regarding service delivery which are on average *at* or *below* the Opportunistic level (level 2):

- The services are often only available through one digital and one traditional channel;
- The services are often registered in a catalogue, but this catalogue is only accessible to a restricted user group (i.e., the public service catalogue is not publicly available) and the service description is not (or only in a limited number of cases) based on standards such as the Core Public Service Vocabulary Application Profile;
- Accessibility features are insufficient and only a few services provide accessibility features for people with disabilities (e.g., visual, auditory, physical, cognitive), but they are in general only fairly compliant with an accessibility standard.
- In the majority of cases, the digital public services and any related documentation are only available in one language.

Service consumption

The interoperability maturity of service consumption is on average *above* the Essential level.

The majority of assessed services are consuming other services mainly or fully digitally. The services are currently reusing a limited number of consumed services from other public administrations whilst they are available for reuse.

The average score for subscription to updates is significantly *below* the Opportunistic level. The public services still rely on systematic manual intervention to integrate updates/up-to-date information or service flows.

Service management

The interoperability maturity of service management is on average *below* the Essential level.

The services assessed score *above* the Essential level for the use of common/standardised concept definitions and controlled vocabularies.

While the service choreography is typically semi-automated, some manual interference is still required. Business processes and rules are increasingly streamlined for the digital public services assessed.

Regarding procurement criteria, the digital public services' components still tend to be only partly procured based on standards.

The study exposed the following areas for improvement regarding service delivery which are on average *at* Opportunistic level:

- The use of existing enterprise architecture frameworks is not generalised for the design of digital public services;
- Only in selected cases the assessed services share contents and knowledge with the external environment extensively ;
- In a low number of cases, Service Level Agreements (SLAs) are concluded, including monitoring compliance.

There is considerable room for improvement regarding the specification process, since services assessed generally do not open up for the participation by administrations, citizens and/or businesses.

1

INTRODUCTION

1. INTRODUCTION

1.1. Document purpose and structure

This report presents the IMAPS 2020 assessments results. It also shows results from the IMAPS assessments completed in the period between 2017 and 2019.

The report is composed of the following Chapters:

- **An Executive Summary** provides an overall summary of the report.
- **Chapter 1** presents the overall context of IMAPS, the IMAPS model and its specialisations (legal, organisational, semantic and technical). It explains how IMAPS fits into the suite of interoperability assessment solutions developed under the ISA² programme (Single Interoperability Assessment Gateway). Finally, Chapter 1 illustrates how IMAPS contributes to the implementation of the Single Digital Gateway.
- **Chapter 2** describes the methodological approach and scope for the selection and analysis of the IMAPS assessment results.
- **Chapters 3-8** present the results from different perspectives: overall interoperability maturity levels (Chapter 3), EIF interoperability levels (Chapter 4), interoperability enablers and manifestations (Chapter 5) and complexity of services (Chapter 6). The detailed results per attribute (question) are presented per service area (service delivery/consumption/management) in Chapter 7. Finally, Chapter 8 looks at the results from an EIF implementation viewpoint.
- **Annexes 1-10** provide additional information to support interpretation of the results. The topics covered include IMAPS attributes and related recommendations, distribution analysis of the results, mapping of IMAPS attributes to the EIF and EIRA version 3.1.0 building blocks. More details on the Single Interoperability Assessment Gateway (SIAG) and the value contribution to the Single Digital Gateway can also be found in the Annexes 8 and 9.

1.2. IMAPS context

1.2.1. Digitisation of public services

The **Digital Agenda** for Europe has identified the lack of interoperable public services as a major obstacle for growth. More recently, the **Digital Single Market strategy** has promoted interoperability and standards as important enablers for the Digital Single Market. Although Member States have accomplished significant work in this domain, it has proven difficult to assess the progress made so far by the different public administrations to reach higher levels of interoperability.

To further encourage the **digitisation of public services and administrative procedures** by Member States, the Single Digital Gateway Regulation was adopted. The establishment of this Gateway aims to facilitate the citizens' and businesses' online access to information, administrative procedures and assistance services. In the horizon of 2023, citizens and businesses should be able to perform a minimum of 21 administrative procedures online within their own country and in a cross-border context. However, the SDG sets a number of requirements for a service or procedure to be considered fully digital and eligible for publication on the SDG. This also covers compliance with interoperability standards. In this context, IMAPS can support Member States in their implementation efforts (see section 1.6).

IMAPS support to the Tallinn Declaration on eGovernment¹

According to the Tallinn Declaration on eGovernment (6th October 2017)², digital transformation of the public administration is a collective endeavour at national, regional and local levels within EU countries as well as at the EU institutions and the related efforts can be greatly facilitated by **collaboration, interoperable solutions and sharing of good practices** throughout public administrations and across borders. The declaration confirms the commitment to the vision laid out in the EU eGovernment Action Plan 2016-2020 and in the European Interoperability Framework. **IMAPS supports the Tallinn Declaration by providing an interoperability assessment tool and related methodology to support development and further improvement of interoperable services** via concrete assessment results, assessment data and related best practice recommendations.

¹ Annex 10 provides a detailed analysis on how the activities of IMAPS support the policy action lines included in the Tallinn Declaration

²<https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-egovernment-tallinn-declaration>

1.2.2. IMAPS as compass for interoperable digital public services

In context of the European Interoperability Strategy (EIS) review, the **IMAPS action** (previously IMM) was set up as part of the ISA² programme¹ (previously ISA programme) with the mandate to develop and maintain IMAPS and to make the solution available to public administrations across Europe. The following objectives were set for the action:

- Deliver a **self-assessment tool** for evaluating the interoperability maturity;
- Provide **peer reviews** of interoperability capabilities across Member States and Directorates General of the European Commission; and
- Enable **interoperability audits**.

While the work of the IMAPS action was mainly focused on **developing the conceptual model and its components** in a first phase (2011-2013), efforts shifted to **simplifying IMAPS** from a user perspective and **aligning it with other ISA² solutions** to ensure coherence (2014-2018). In parallel, **awareness-raising campaigns** were implemented to share knowledge on IMAPS and promote its uptake by public administrations across Europe.

In 2018, a **new version of IMAPS was released**, aligned with the **new European Interoperability Framework (EIF)** adopted in March 2017. The new EIF provides specific guidance on how to set up interoperable digital public services. It outlines 50 specific recommendations on how to improve governance of public services' interoperability activities, establish cross-organisational relationships, streamline processes supporting end-to-end digital services, and ensure that both existing and new legislation do not compromise interoperability efforts.

The launch of the new IMAPS version – now accessible as online survey questionnaire via the EU Survey portal – was accompanied by large-scale IMAPS assessment campaign. The IMAPS action **published a report²** presenting the highlights of the results and providing insight into the state of interoperability of digital public services in Europe. The report concluded that the **interoperability maturity level** of the digital public services assessed scored on average above the Essential level (level 3 of the IMAPS maturity scale), while Seamless interoperability remains the target (level 5).

1.2.3. IMAPS up-to-date

Since 2019, the focus of the work of the IMAPS action evolves around **raising awareness** on IMAPS and **assisting** public administrations in EU Member States in the **uptake** of IMAPS by their organisation, through capability-building and sharing of relevant knowledge, insights and good practices.

¹ The ISA² Programme supports the development of digital solutions that enable public administrations, businesses and citizens in Europe to benefit from interoperable cross-border and cross-sector public services. ISA² is running from 1 January 2016 until 31 December 2020.

² Directorate-General for Information, ISA Action 2016.37: Report on IMAPS Results 2018 Edition, 2018

Up-to-date, IMAPS was used for around **200 assessments** of digital public services, covering **various types of services** provided by public administrations to citizens, business and other administrations – from the local to the European level.

At the same time, the IMAPS survey is under **continuous improvement** leading to the release of a new version in July 2020. In complementarity with IMAPS, four **specialised versions** were developed allowing public administrations to get further insight into the interoperability maturity of their digital public service considering **all EIF dimensions** (i.e. legal, organisational, semantic and technical) (see section 1.4).

Finally, IMAPS has coordinated the creation of the **Single Interoperability Assessment Gateway** (SIAG) (see section 1.5), involving other ISA² actions (e.g.) Interoperability Quick Assessment Toolkit (IQAT), in view of facilitating access of users to the relevant solutions.

1.3. IMAPS model overview

IMAPS is an online survey that helps public service owners **evaluate, consider and improve all behavioural key interoperability aspects** of their digital public service (legal, semantic, organisational, or technical). Ultimately, they can view and monitor the service’s compliance with the **New European Interoperability Framework** (EIF).

In the context of interoperability maturity, IMAPS assesses the **behavioural interoperability** of a digital public service. Interoperability is of multidimensional nature involving structural interoperability, behavioural interoperability and governance interoperability. The behavioural interoperability is "the extent its manifested behaviour exchanges data, information or knowledge with its environment in support of a peer-to-peer collaboration". **Figure 1** illustrates the digital public service in the context of behavioural interoperability.

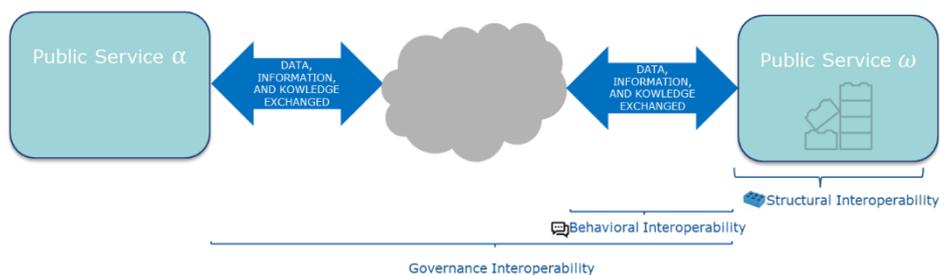


Figure 1: Overview of interoperability dimensions

In particular, IMAPS measures how well a public administration interacts with **external entities** to organise the efficient provisioning of its public services to other public administrations, businesses and citizens.

IMAPS uses the term **‘behavioural’** to refer to the fact that it assesses aspects that have to do with how the public services ‘behave’ while interacting with each other or with their end users (citizens, business or other Public Administrations).

IMAPS looks at **three different service areas** (see figure below):

- **Service Delivery (D)** — Delivery of the digital public service to its end users¹;
- **Service Consumption (C)** — Consumption of reusable machine-to-machine services from other public administrations and businesses. This can include the consumption of functionalities, base registry information and security services;
- **Service Management (B)** — Controlling and monitoring the process flow related to service interactions with the external domain from trigger to outcome. This area includes service management aspects such as enterprise architecture, procurement, and service level management.

Figure 2 below describes all possible instances where behavioural interoperability with the outside world may occur from the digital public service viewpoint.

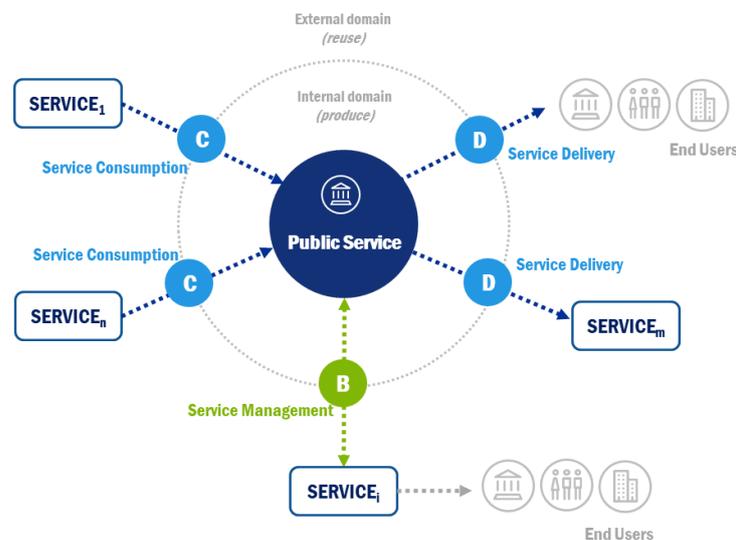


Figure 2: Overview of the behavioural interoperability areas of IMAPS

The areas (hereafter referred to as Interoperability Areas) indicated in **Figure 2** are the object of measurement in the IMAPS, specifying where interoperability plays a role from a service management, service delivery and service consumption viewpoint.

¹ The numbering of the areas (D.C.B) is based on the sections of the questionnaire. As there is a service identification section (A) in the questionnaire, the numbering of the areas starts at B.

1.3.1. Service Delivery

The public administration **delivers the digital public service** towards end users i.e., citizens, businesses or other administrations. We call this **Service Delivery**. The service that is being delivered represents the focal point of the IMAPS in terms of correctly scoping and delimiting the digital public service under evaluation. If service delivery is scoped correctly, the scoping of the other areas becomes more straightforward. The Service Delivery area focuses on the channels through which the digital public service is made available and on important interoperability aspects such as pre-filling, multilingualism, privacy, feedback and open semantic standards.

1.3.2. Service Consumption

For delivering the digital public service towards the end user, the digital public service may be **required to consume services of other public administrations or businesses**. This area is called **Service Consumption** and it focuses on the consumption of reusable machine-to-machine (client) services from other public administrations and businesses. This can indicatively include the consumption of functionalities, base registry information and security services.

There are **various types of services** that can be consumed by digital public services:

- *Functional service* — a common functionality (e.g., issuing a license, procurement, planning, a risk assessment module) shared across organisations;
- *Security service* — a specific type of functional service to share common security functions (e.g., identity management and authentication) across organisations;
- *Base registry service* — a specific type of functional service to share trusted, authentic and verified data (about e.g., citizens, land, vehicles) across public administrations.

Digital public services that consume (reuse) existing services where possible are considered more interoperable than organisations that produce (develop) their own proprietary services without reusing existing functionalities.

1.3.3. Service Management

This area focuses on important **Service Management** aspects on the area of **sharing and reuse and design** of the digital public service. Digital public services are considered more interoperable if documentation, source code, services and support is provided towards other administrations and business for reuse. In addition, this area covers important design aspects that ensure future-proof interoperability such as architecture, processes, procurement and service level management.

1.3.4. IMAPS maturity stages

The IMAPS uses a **five-stage model** to indicate the interoperability maturity of the digital public service (**Table 1**). Using maturity levels allows to:

- Measure the interoperability maturity of the digital public service as a whole as well as underlying aspects;
- Indicate which capabilities and next steps are required to reach higher levels, and thus improve interoperability maturity.

A five-stage approach is often seen in proven maturity models and is considered as best practice for assessing and improving maturity. The five maturity levels for IMAPS are summarised in the table below.

Table 1: Five maturity stages of IMAPS

Maturity level	Maturity stage	Interpretation
1	Ad Hoc	Poor interoperability — the digital public service cannot be considered interoperable
2	Opportunistic	Fair interoperability — the digital public service implements some elements of interoperability best practices
3	Essential	Essential interoperability — the digital public service implements the essential best practices for interoperability
4	Sustainable	Good interoperability — all relevant interoperability best practices are implemented by the digital public service
5	Seamless	Interoperability leading practice — the digital public service is a leading interoperability practice example for others

1.4. IMAPS specialisations

Starting from IMAPS' global view of the interoperability maturity, IMAPS specialisations (L, O, S, T) provide insights on specific interoperability viewpoints of the digital public service, i.e. the legal, organisational, technical and semantic interoperability viewpoints. The developed specialised versions of IMAPS enable public service owners to assess their digital public services in terms of their:

- **Legal Interoperability (LIMAPS):** the LIMAPS survey measures and improves the **legal** behavioural interoperability maturity of digital public services. Legal interoperability focuses on the legal provisions that regulate the collaboration among different public administrations that operate under different legal mandates;
- **Organisational Interoperability (OIMAPS):** the OIMAPS survey measures and improves the **organisational** behavioural interoperability maturity of digital public services. Organisational interoperability focuses on business processes and the collaboration among public administrations of different internal structures and user community requirements;
- **Semantic Interoperability (SIMAPS):** the SIMAPS survey measures and improves the **semantic** behavioural interoperability maturity of digital public services. Semantic interoperability enables a meaningful manner of information exchange and ensures that their precise meaning is understood and preserved throughout exchanges between different organisations;
- **Technical Interoperability (TIMAPS):** the TIMAPS survey measures and improves the **technical** behavioural interoperability maturity of digital public services. Technical interoperability focuses on the technical aspects of linking information systems and services (interface specifications, interconnection services between hardware and software, etc.).

All IMAPS specialisations provide the following common **benefits** for public service owners:

- **Immediate insight** into the behavioural interoperability of a digital public service;
- **Tailored recommendations** on how to improve the digital public service at any point in time throughout its lifecycle;
- **Improved interaction** of the digital public service with its end users;
- **Applicable to any digital public service** in the EU; and
- **Compliance** with the latest version of the European Interoperability Framework (EIF).

While IMAPS examines three service areas, i.e. service delivery, service management and service consumption, the IMAPS specialisations focus on service delivery and service consumption. **Figure 3** below describes the possible instances where behavioural interoperability with the outside world may occur from the digital public service viewpoint.

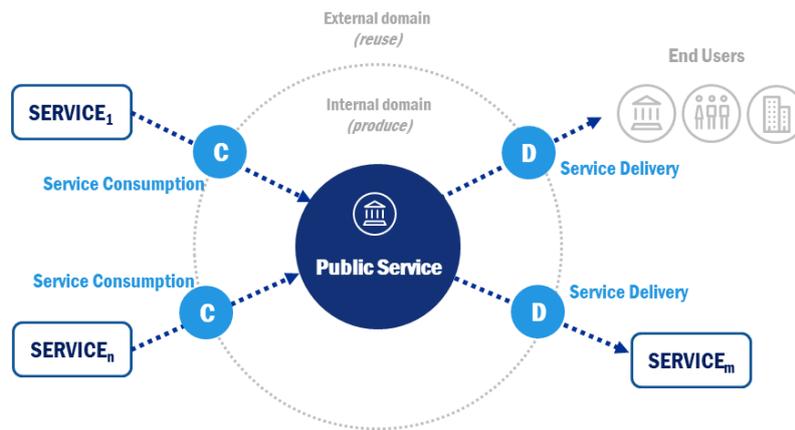


Figure 3: Overview of the behavioural interoperability areas of the IMAPS specialisations

IMAPS specialisations surveys can serve **complementary** to the IMAPS assessment. They effectively **address questions on the legal, organisational, semantic and technical behavioural interoperability** that are not included or not assessed in-depth in IMAPS survey, They can be applied in these cases where IMAPS results reveal aspects of the digital public service that include legal, organisational, technical or semantic interoperability aspects that have to be assessed in more depth.

Triggers of LIMAPS, OIMAPS, SIMAPS and TIMAPS are addressed in IMAPS recommendations as complementary actions towards public service owners to further assess the legal, organisational, semantic and technical interoperability maturity level of their digital public services.

1.5. Single Interoperability Assessment Gateway (SIAG)

The **Single Interoperability Assessment Gateway** (SIAG) provides a single point of access to all ISA² interoperability assessment solutions. These solutions help public administrations to design, develop, implement, evaluate and to improve the interoperability of their digital public services and of its various components.

The Gateway was launched in 2019 as a **joint initiative of the ISA² action and solution teams** in charge of interoperability assessment solutions.

The aim of the Gateway is to allow users to find in one click the right solution – free of charge – that they need for their specific situation. The Gateway references four interoperability assessment solutions:

- **IMAPS:** Interoperability Maturity Assessment of a Public Service
- **CAMSS:** Common Assessment Method for Standards and Specifications

- **IQAT:** Interoperability Quick Assessment Toolkit
- **ITB:** Interoperability Test Bed

Benefits

The SIAG helps public service owners to discover and to use the ISA² interoperability assessment solutions by:

- Showing in one view all interoperability assessment solutions and tools developed under the ISA² programme;
- Guiding users to the interoperability assessment solution(s) relevant for their use case;
- Providing key characteristics and information on the solution and tool;
- Illustrating the use of the solutions with concrete examples;
- Giving access the latest release of the solutions.

User profiles and use cases

The Gateway has defined **six user profiles** and their **specific needs** regarding interoperability (see **Table 2:** SIAG user profiles, use cases and interoperability assessment solutions. Based on their profile and use case, SIAG users can easily view the solution that is relevant for them. For a full description of the solution and their use cases, please consult Annex 9. SIAG

Table 2: SIAG user profiles, use cases and interoperability assessment solutions

You are...	You want to...	This solution could be relevant for you
Policy-maker	Get insights on the interoperability maturity of digital public services and address gaps and challenges for a future-proof, evidence-based policy-making	IMAPS (LIMAPS, OIMAPS, SIMAPS, TIMAPS) CAMSS
Public Service Owner	Diagnose the behavioural interoperability maturity level of a digital public service	IMAPS (LIMAPS, OIMAPS, SIMAPS, TIMAPS) IQAT
Public Procurement Officer	Identify standards and specifications for an interoperable digital public service	IMAPS (LIMAPS, OIMAPS, SIMAPS, TIMAPS) CAMSS ITB

You are...	You want to...	This solution could be relevant for you
IT Solutions Portfolio Manager	Gather insights for the governance of a portfolio of interoperable solutions for digital public services	IMAPS (LIMAPS, OIMAPS, SIMAPS, TIMAPS) CAMSS
IT Requirements Manager	Analyse and assess the functionalities of a To-Be digital public service	IMAPS (LIMAPS, OIMAPS, SIMAPS, TIMAPS) CAMSS ITB
IT Software/ Application Architect and Developer	Design, develop and assess an interoperable software solution for a digital public service	IQAT CAMSS ITB

1.6. IMAPS value contribution to the Single Digital Gateway

In October 2018, the Single Digital Gateway (SDG) Regulation (EU Regulation 2018/1724¹) was adopted to create a **single point of access of digital public services for citizens and businesses across Europe**. The SDG aims to facilitate online access to the information, administrative procedures and assistance services that citizens and businesses need to get active in another EU country. On their side, all governments need adapt their legal framework and **digitalise their public services** for their own citizens and businesses but also for giving access for those established in other EU Member States.

The SDG Regulation sets out the following **objectives**:

- **Objective 1:** ensure access to information for a series of administrative procedures by December 2020;
- **Objective 2:** offer fully online a series of 21 administrative procedures cross-border by December 2023 (see Annex 8. IMAPS value contribution to the Single Digital Gateway ; and
- **Objective 3:** set up a technical system for the cross-border automated exchange of evidence and application of the ‘once-only’ principle by December 2023.

To promote services to the Gateway, public administrations need to make sure that they meet a **set of requirements**.

¹ REGULATION (EU) 2018/1724 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012

IMAPS can support public administrations in their efforts in implementing the SDG regulation and aligning their administrative procedures with the SDG requirements. The IMAPS assessment includes a **number of interoperability attributes that mirror SDG requirements**, such as on procedural transparency, accessibility, multilingualism or cross-border data exchange (see **Table 3**: IMAPS attributes related to SDG requirements).

They can make their administrative procedures fit-for-purpose for the SDG by:

- Assessing the **level of digital maturity** of a public service that needs to be provided online by 2023 and accessible via the Single Digital Gateway, such as the submission of a corporate tax declaration or the application for a European Health Insurance Card (EHIC);
- Checking whether their public service can be **considered fully digital** in light of the requirements set out in Article 6 of Regulation (EU) 2018/1724 looking at delivery channels (IMAPS attribute B1);
- Highlighting the **most mature** and **digital-ready** online services;
- Providing insights and recommendations for improving the digital and cross-border aspects of the service;
- Providing guidance for identifying and selecting **the most compliant services** to be promoted to the SDG;
- Outlining requirements for the development of any future service that is **digital and interoperable by design**; and
- Sharing **good practices and guidelines** for Member States on how to integrate their national environments with the upcoming SDG infrastructure to be built across Europe.

Table 3: IMAPS attributes related to SDG requirements

SDG requirement	IMAPS attributes	EIF level
Article 9 Quality of information on rights, obligations and rules	B1: Delivery channels	Technical
	B3: Procedural transparency	Organisational
	B4: Data privacy	Legal
	B8: Multilingualism	Semantic
	B10: Service catalogue	Technical
Article 11 Quality of information procedures	B1: Delivery channels	Technical
	B3: Procedural transparency	Organisational
	B6: Accessibility	Technical
	B8: Multilingualism	Semantic
Article 12	B8: Multilingualism	Semantic

SDG requirement	IMAPS attributes	EIF level
Translation of information		
Article 13	B7: Cross-border service delivery	Organisational
Cross-border access to online procedures	B9: Data exchange	Semantic
	B11: Certification	Organisational
Article 25	B5: User feedback	Organisational
User feedback on the services of the gateway		
Article 14	B1: Delivery channels	Technical
Technical system for the cross-border automated exchange of evidence and application of the 'once-only' principle	B2: Pre-filling	Technical
	B9: Data exchange	Semantic
	C2: Manual or digital consumption of services	Technical
	C3: Reusing or producing services	Technical
	C4: Subscription to updates	Technical
	B10: Service Catalogue	Technical
	D3: Service choreography	Technical
	D5: Architectural Framework	Technical

2

ANALYSIS OF IMAPS 2020 RESULTS

2. Analysis of IMAPS 2020 results

2.1. Approach

This report is based on IMAPS assessments completed by respondents on a **voluntary basis** in the **period January to July 2020** (using IMAPS v1.1.1) following a series of IMAPS awareness-raising communications.

Upon a **data quality and compliance check**, only those assessment results were included in the final section for which accurate data and comprehensive information on the service assessed were available. Individual results have been anonymised and findings are only shown in an aggregated way.

Given that the 2020 value distributions **only follow a normal distribution for attributes related to Service Delivery (B)**, it is suggested that the sample is only representative of the population for those and, therefore only findings for Service Delivery can be extrapolated to the population (see Annex 4). The results for IMAPS attributes C2¹ (manual or digital consumption of services) and D6 (specification process) show a significant deviation from normality and are therefore considered not representative for the population (see Annex 4. Distribution analysis of the results per attribute).

This report has been drafted and published in follow-up to the IMAPS report on the 2018 results². As such, it also occasionally makes references to the IMAPS assessment results from previous years (2017, 2018 and 2019). Given the **limited comparability of the contributions** (e.g. different sample of types of public services assessed, different geographical coverage, etc.), this report only shows the results in a comparative view without pretending to draw general conclusions on the state of interoperability of digital public services across Europe.

An improved IMAPS version (v1.1.1) was used for the 2019 and 2020 IMAPS assessments which provides a more accurate picture of the interoperability maturity level of the digital public services assessed than compared to the findings of the IMAPS report 2018 edition.

¹ The skewness for C2 is at -1.60 and for D6 at 1.52. Values outside the +/- 1 range for skewness are considered departures from normality (see Annex 4).

² European Commission, Directorate-General for Informatics, Report on IMAPS Results 2018 Edition, 2018.

2.2. Scope

The study covers 40 public service assessments from 8 countries, including 19 digital public services which are provided in a European and/or international context.

The study has **limited geographical coverage** with 8 countries with a large majority of assessments received by Greece (32), followed by 5 assessments on digital public services provided by EU institutions, and Belgium with 4 assessments. In 2020, half of the digital public services assessed are provided in a European and/or international context.

The **number of assessments** in 2019 was slightly higher (50), including also contributions from non-EU countries. Again, Greece scores highest in terms of the number of IMAPS assessments completed (33).

In total, 10 EU countries (incl. Norway) and 2 non-EU countries participated in the IMAPS assessment in the period between 2019 and 2020.

2.2.1. Number of assessments

The table below shows the number of assessments in scope of this report for 2020 and provides a comparative view on the 2019 results.

Table 4: IMAPS assessment results in numbers (2019-2020)

Year of assessment	2019	2020
Total number of assessments	50	40
Number of countries	10	8
Number of assessments from EU¹ countries	46	40
Number of services provided in a EU and/or international context²	10	29
Number of non-EU assessments	4 ³	0

¹ Incl. Switzerland and Norway

² Number of digital public services assessed which indicated as administrative levels the European and international levels

³ The country is unknown for two IMAPS assessments

2.2.2. Geographical coverage

The figure below shows the **number of contributions per country** (EU and non-EU) for the period 2018 to 2020. The highest number of contributions were received by Greece (in total 73), followed by Malta (8), Cyprus (6), Belgium (5), Slovenia (5) and Czech Republic (4).

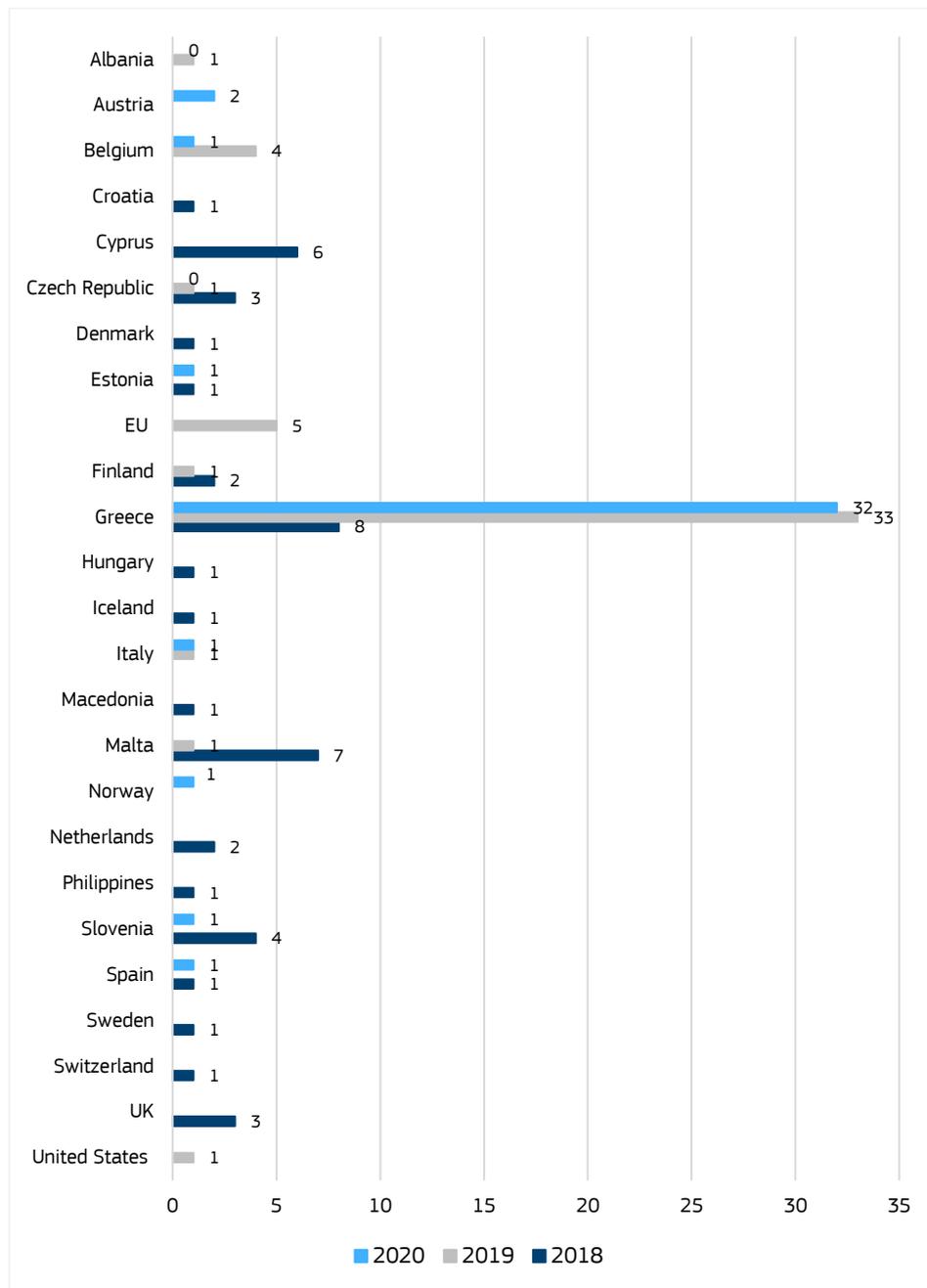


Figure 4: Number of assessments per country (2018-2020)

2.2.3. Administrative levels

Assessment data shows that the services assessed are **available at different levels of administration**. The majority of digital public services are provided at National level (50%). In 2020, 46% of the digital public services provided involve multiple administrative levels, including the European and International levels. **Figure 5 Error! Reference source not found.** details the number of services at each level – National, Regional, Local, European or International.

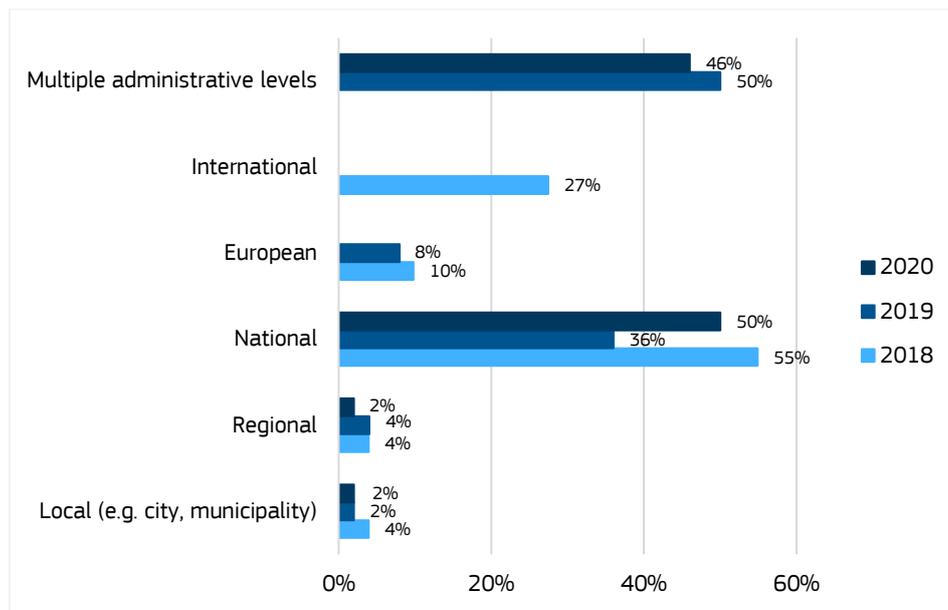


Figure 5: Number of assessments per level (2018-2020)

2.2.4. Types of digital public services

The public services assessed in 2020 are grouped into **13 types of services**, covering **different public policy domains** in **Table 5**. In 2019, 15 different types of services were assessed (see Annex 7 Table 21: *IMAPS results 2019 – Types and description of services assessed*)

Table 5: *IMAPS results 2020 – types and description of services assessed*

Type of public service	Description of public services assessed
Citizenship	Certificates, e.g., births/marriages Provisioning of digital certificates for citizens
Data/document provisioning	Provisioning of open data services
Education	Application for training programme Education related information services
Employment	Employment related services
Financial	Online payment services

Type of public service	Description of public services assessed
IT services	Supporting services aimed at enabling online interaction of citizens and businesses with various government agencies
Law related	Law-making related services
Medical/health	Healthcare related information registries/services
Procurement	Digital procurement service
Recruitment/employment	Recruitment services for citizens/government offices
Social care	Social care online applications Social care related data provisioning to citizens
Taxation	Tax declaration services
Transportation	Application for public transport services

As shown in **Figure 6**, most of the services assessed relate to medical/health (25%), followed by services provided in the domain of social care (15%), procurement (12.5%), IT services (10%), citizenship and education (7.5%).

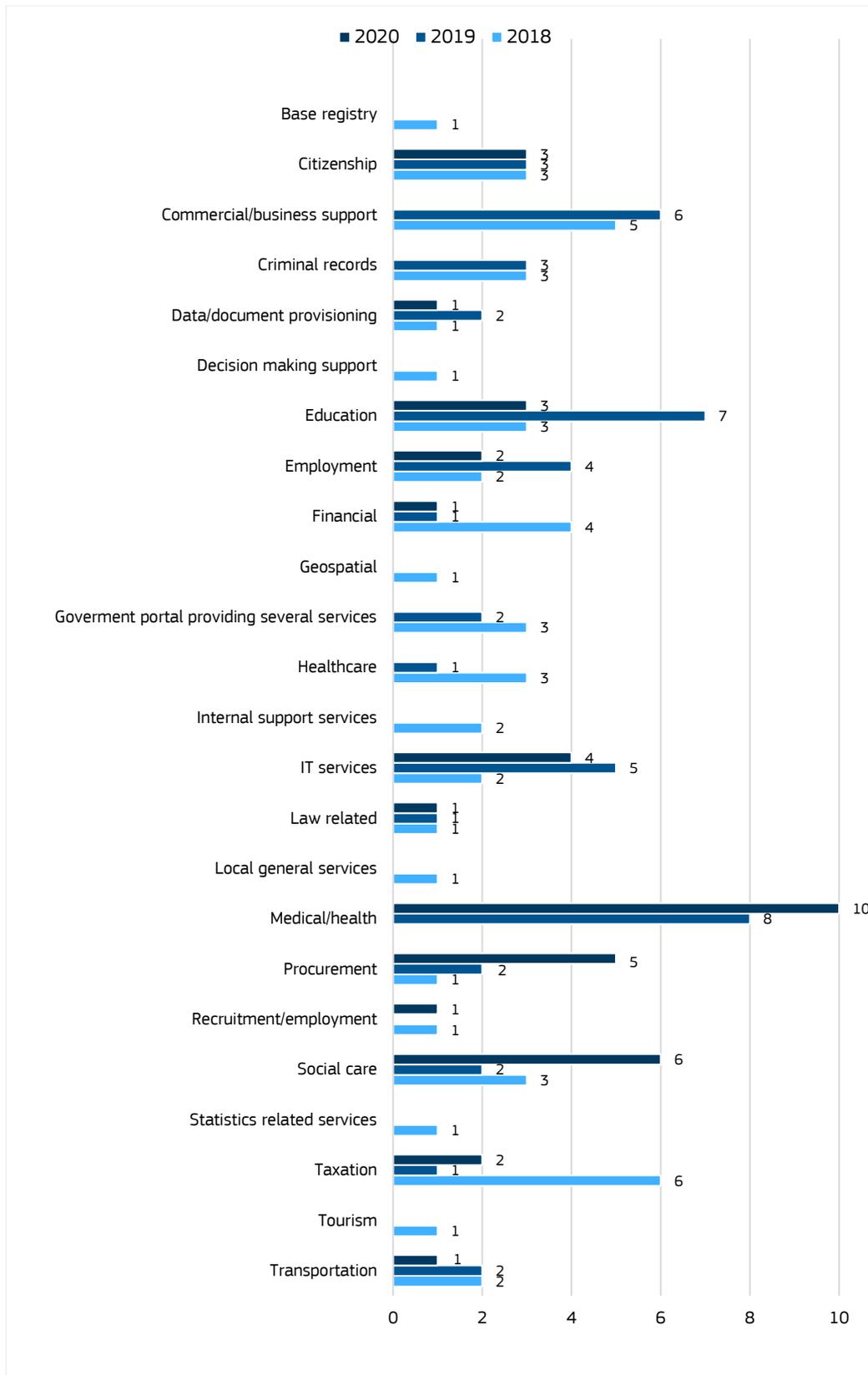


Figure 6: Types of digital public services assessed (2018-2020)

3

IMAPS RESULTS ON INTEROPERABILITY MATURITY LEVELS

3. IMAPS results on interoperability maturity levels

Overall interoperability maturity of the digital public services assessed is below the Essential level.

The results from the IMAPS assessments suggest that the overall maturity average of the digital public services assessed is **below the Essential level** in 2020 with a result of 2.87 (see **Figure 7**). Essential means that the digital public service implements the **essential best practices** for interoperability.

This shows a **decrease in the maturity scores** compared to the previous years (2017-2019) in which the assessed service areas were **on average above the Essential level**. Only one service area, i.e. **service consumption** is above Essential level (3.41) while service delivery (2.87) and service management (2.52) score below. The three interoperability areas are independent from each other, there is **no link or overlap between their attributes**. The results of 2020 are slightly lower compared to the 2019 results.

Overall the comparison of the results for the services areas in the period 2017-2020 **shows consistency**: service consumption scores highest (range between 3.23 and 3.56), followed by service delivery (range between 2.87 and 3.34) and service management (2.52 and 3.18).

It is observed that **service consumption scores are slightly higher than service delivery**. One reason for this observation might be that the items in this section assess **high level aspects** that may score higher and are fewer in number (3 versus 8 (service management) and 11 (service delivery)).

On the other hand, **service delivery** items assess interoperability maturity based on **more complex aspects** having higher requirements (data readiness, digital delivery, etc.) which are prerequisites for service consumption. Therefore, it is more difficult to score higher in the area of service delivery, as it has to cover more requirements, rather than service consumption.

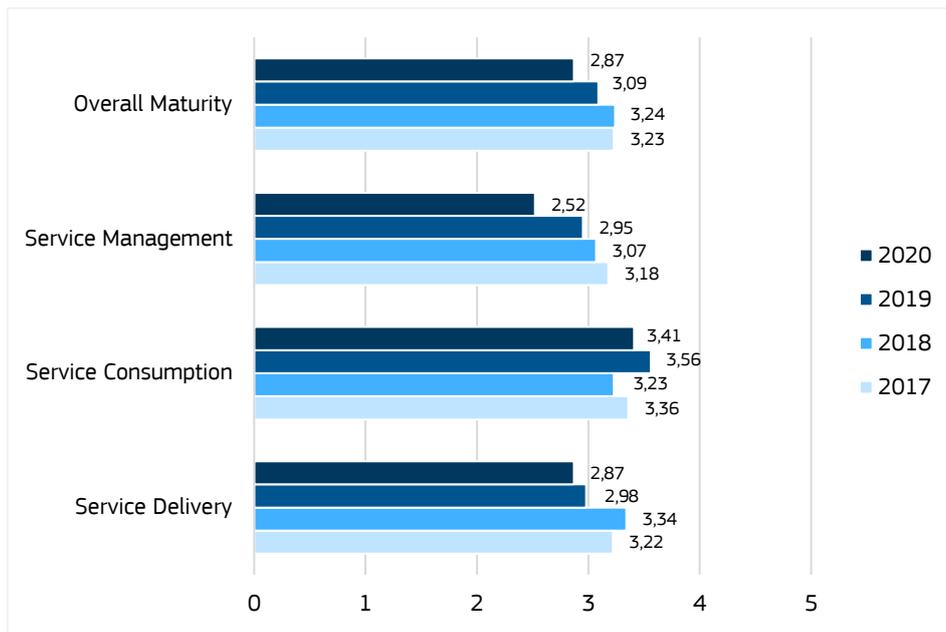


Figure 7: IMAPS results 2017–2020 – all assessments¹

The desired interoperability level as stipulated in the IMAPS for a digital public service is at least level 4: Sustainable. At this level, the digital public service is considered to have implemented key relevant best practices.

Table 6: IMAPS results 2020 – performance increase from Levels 2 to 4

Ad Hoc Level 1	Opportunistic Level 2	Essential Level 3	Sustainable Level 4	Seamless Level 5
Poor interoperability — the digital public service cannot be considered interoperable	Fair interoperability — the digital public service implements some elements of interoperability best practices	Essential interoperability — the digital public service implements the essential best practices for interoperability	Good interoperability — all relevant interoperability best practices are implemented by the digital public service	Interoperability leading practice — the digital public service is a leading interoperability practice example for others
	Current maturity level Overall maturity for all assessments Average maturity for service delivery and service management	Next maturity level Average maturity for service consumption	Desired maturity level	

¹ The overall score is the weighted average of the three areas: Service Delivery: 50%, Service Consumption: 20%, Service Management: 30%

Table 6 indicates the **shift required from Level 2 to the next level** (Essential) with the desired level of Sustainable (Level 4). This implies enhancing the public service's interoperability performance to a level that can be considered solid enough to systematically enable the reaping of interoperability benefits.

Each attribute is evaluated and a specific recommendation is provided to shift to the next interoperability maturity level. The **detailed recommendations** are available in Annex 3.

IMAPS attributes and related recommendations for enhancing interoperability.

4

IMAPS RESULTS ON EIF INTEROPERABILITY MATURITY LEVELS

4. IMAPS results on EIF interoperability levels

The organisational view get the lowest maturity score while digital public services assessed perform on average highest in terms of legal interoperability.

IMAPS attributes each relate to one or several of the four **levels of interoperability of the European Interoperability Framework**¹ (Legal, Organisational, Semantic and Technical levels). Detailed IMAPS data shows that interoperability levels are implemented rather unevenly, as shown in **Figure 8**². The **legal** interoperability-related results are those with the highest score (3.18), followed by the **semantic** level results (2.89), and the **technical** interoperability-related results (2.86). The **organisational**

interoperability-related results are those with the lowest score (2.7). Public services assessed only score for legal interoperability above the Essential level.

The results slightly deviate from the year 2019 results apart from the legal level. From legal interoperability perspective the maturity is clearly higher on year 2019 results.

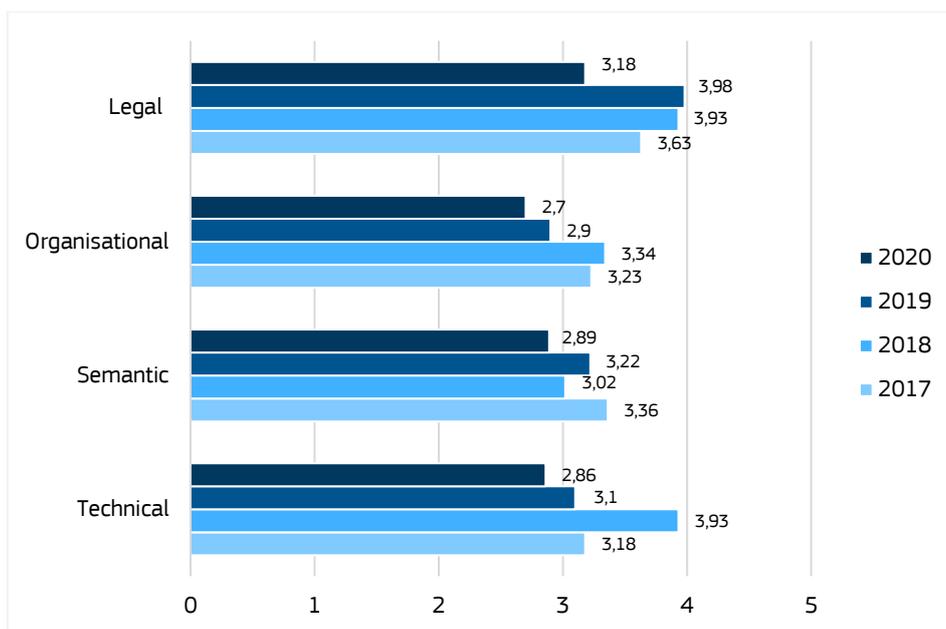


Figure 8: IMAPS results 2017-2020 – EIF interoperability level-related attributes – average score

There is **one IMAPS attribute** (B4 – data privacy) which relates to **legal interoperability**. This is presented in **Figure 9** with the related IMAPS 2020 score. Annex 1. IMAPS attributes mapped to the European Interoperability Framework (EIF) details each individual attribute in terms of what aspect of interoperability is being covered by it.

¹ https://ec.europa.eu/isa2/eif_en

² Each IMM attribute is related to one or several EIF interoperability levels, as listed in the tables in Annex 1

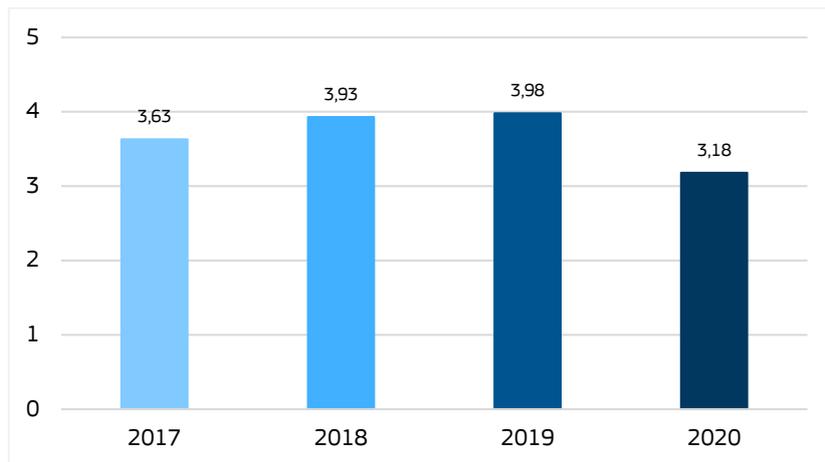


Figure 9: IMAPS results 2017-2020 – average scores for legal interoperability related attributes¹

There are 9 IMAPS attributes which relate to organisational interoperability. They are presented in **Figure 10** with their IMAPS 2020 score.

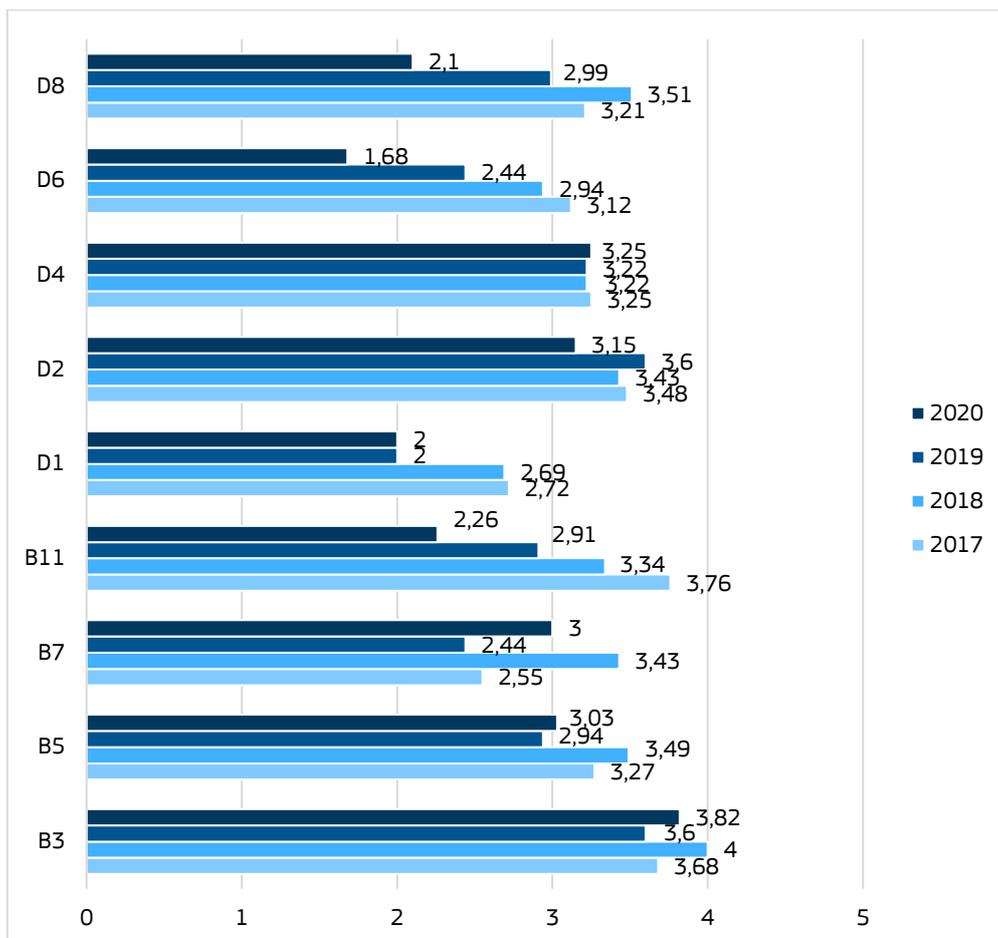


Figure 10: IMAPS results 2017-2020 – average scores for organisational interoperability related attributes²

¹ A description of IMAPS attributes is available in Annex 2

² A description of IMAPS attributes is available in Annex 2

There are **three IMAPS attributes** which relate to **semantic interoperability**. They are presented in **Figure 11** with their IMAPS 2020 score.

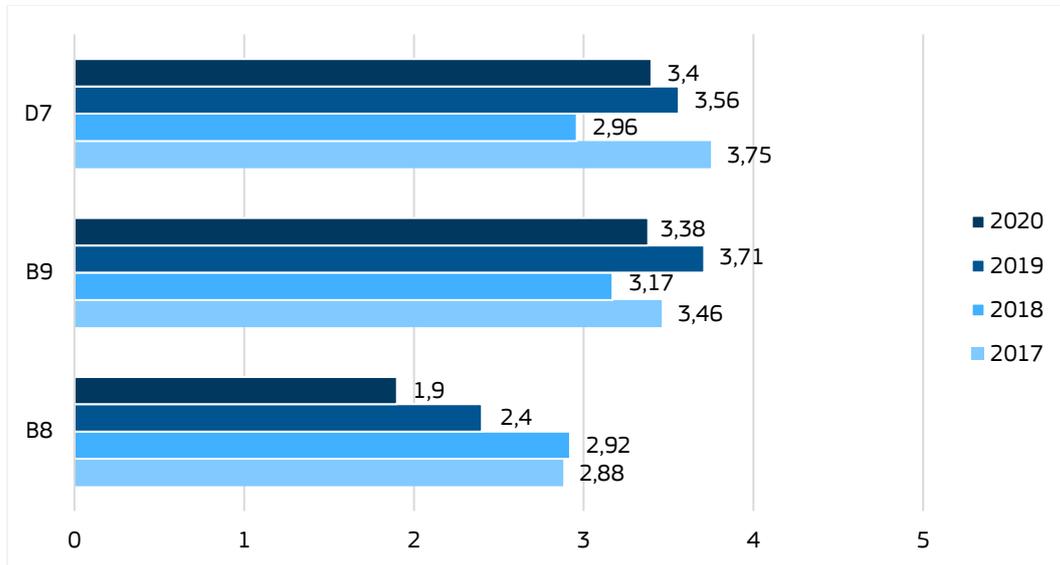


Figure 11: IMAPS results 2017-2020 – average scores for semantic interoperability related attributes¹

¹ A description of IMAPS attributes is available in Annex 2

There are **nine IMAPS attributes** which relate to **technical interoperability**. They are presented in **Figure 12** with their IMAPS 2020 score.

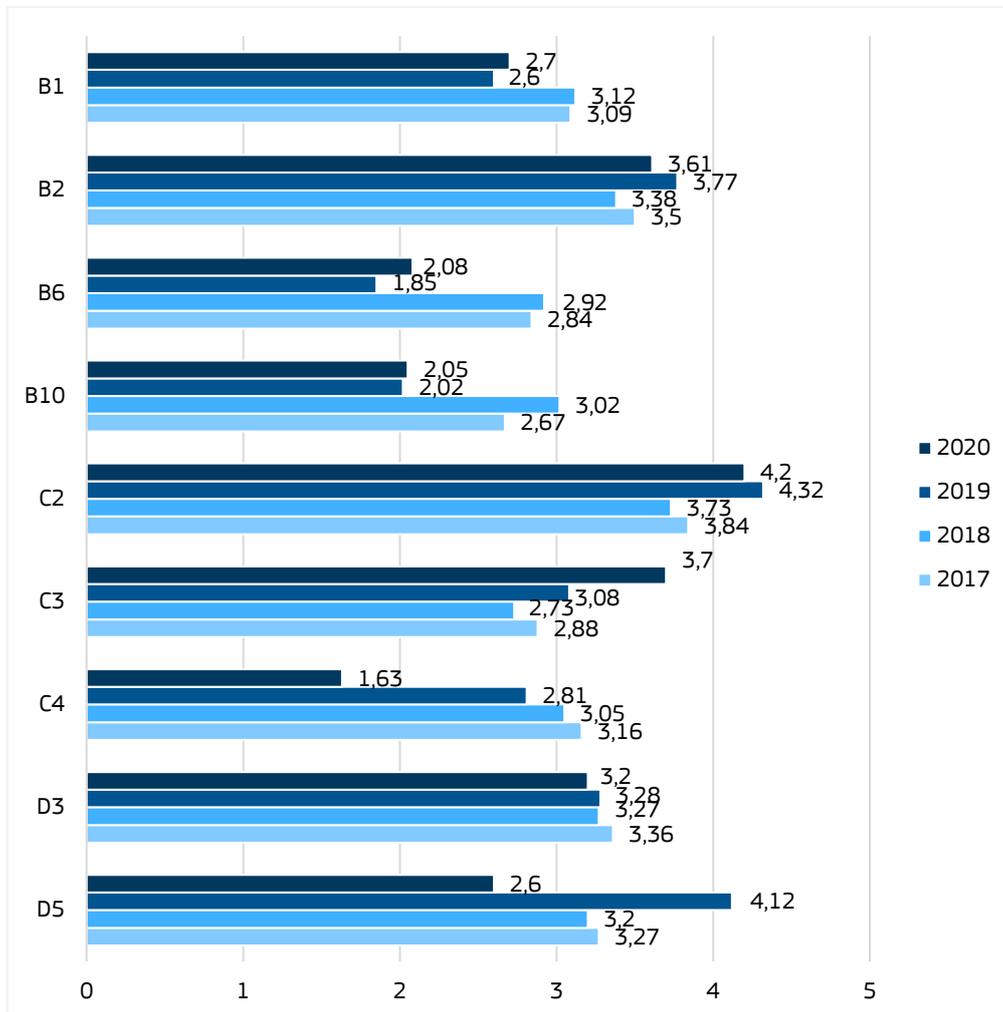


Figure 12: IMAPS results 2017-2020 – average scores for technical interoperability related attributes¹

¹ A description of IMAPS attributes is available in Annex 2

5

IMAPS RESULTS ON INTEROPERABILITY ENABLERS AND MANIFESTATIONS

5. IMAPS results on interoperability enablers and manifestations

An **interoperability enabler** relates to an attribute, which, when it exists or is implemented, **enables** interoperability. An example is attribute D.2, which is at the highest interoperability level when procurement of the service is fully standards-based.

An **interoperability manifestation** relates to an attribute, which **shows** interoperability. An example is attribute B.2, which is at the highest interoperability level when all possible forms are pre-filled.

Detailed IMAPS assessment data shows that attributes related to interoperability enablers and attributes related to interoperability manifestations show **variances in the average maturity results**¹. **Error! Reference source not found.**Figure 13 illustrates the average maturity level of the interoperability enabler attributes (2.74) and the interoperability manifestation attributes (2.94) for the 2020 assessments. While in 2019, the interoperability enabler attributes were significantly higher than the interoperability manifestation attributes, this has been inversed for digital public services assessed in 2020.

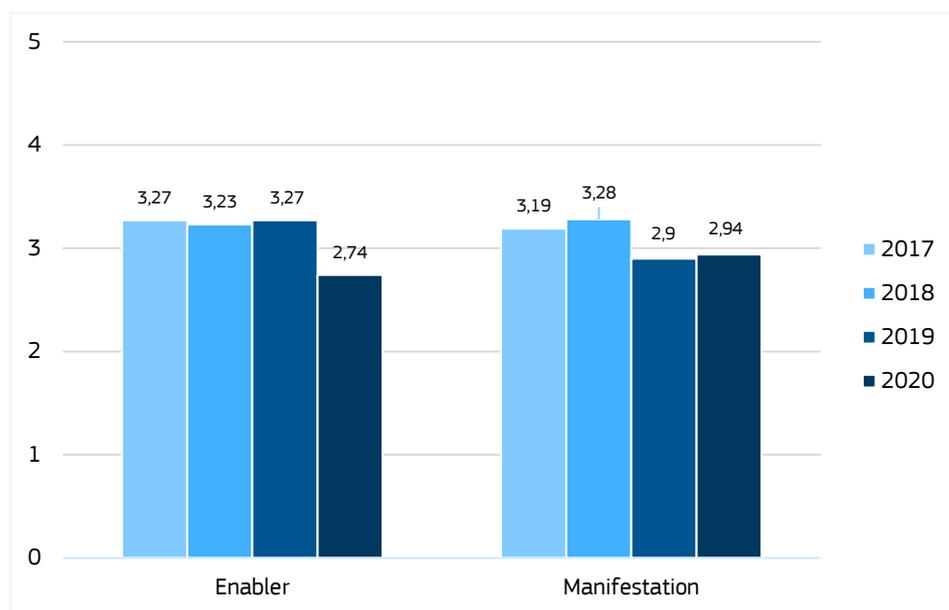


Figure 13: IMAPS results 2017-2020 - interoperability manifestation and enabler attributes' maturity

¹ Details on the manifestation-related attributes and enabler-related attributes in terms of what they assess are given in Annex 2

6

IMAPS RESULTS ON COMPLEXITY OF SERVICES

6. IMAPS results on complexity of services

Authentication, data exchange and messaging services are the most consumed services by the digital public services assessed in 2020.

The complexity of a public service can be derived as a proxy in the IMAPS by the number of services it consumes. The detailed IMAPS assessment data shows that many different types of services are consumed, as listed in **Figure 15**. The most consumed service is the authentication service (80%), followed by the data exchange (40%) and messaging services (32.5).

At the other end of the service consumption spectrum, services that are consumed by **less than 10%** of the services assessed are choreography, forms management, registration, data publication and e-archiving services.

None of the assessed services reuses machine translation, orchestration and service discovery services.

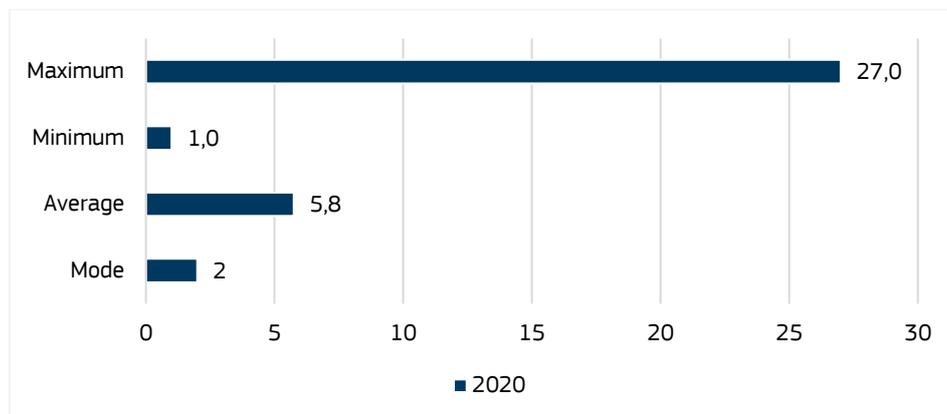


Figure 14: IMAPS results 2020 – number of consumed services by public service assessed

Detailed assessment data shows, as illustrated in **Figure 14**, that the maximum number of services reused is 27, the minimum is 1. While on average, services reuse 5.8 other services, the most cited number of reused services is 2.

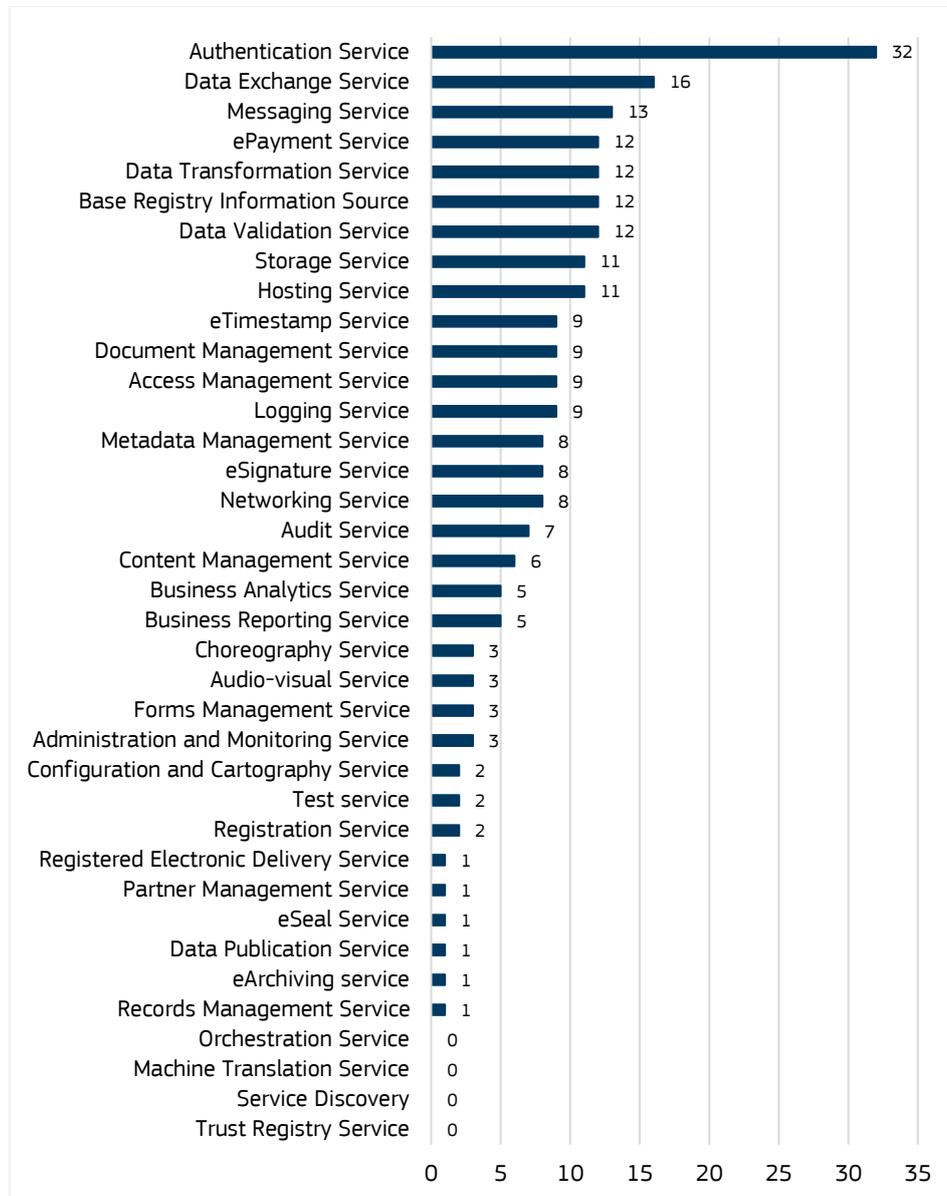


Figure 15: Number of services consumed by services assessed (2020)

Please find in Annex 5 the results on the number of consumed services for the years 2017, 2018 and 2019.

7

IMAPS DETAILED RESULTS ON SERVICE AREAS

7. IMAPS detailed results on service areas

Half of the interoperability attributes of the digital public services assessed are above Essential level.

Detailed assessment data shows that half (12 out of the 22) of all the attributes are above level 3 — Essential. The average maturity level of the digital public services assessed stands at 2.87, compared to 3.09 in 2019.

Questions C2 (Manual or digital consumption of services) and B3 (Procedural transparency) show the **highest level of maturity** (4.2/3.82), while questions C4 (Subscriptions to updates) and D6 (Specification process) score the **lowest level** (1.63/1.68).

Looking at the assessment results from previous years¹ (see **Figure 16**), there is a **significant difference in the maturity level** for questions B11 (Certification), C4, D6 and D8 (Service Level Agreements) which are clearly lower.

The **average maturity level seems relatively stable** for questions B2 (Pre-filling), B3, D2 (Procurement criteria), D3 (Service choreography) and D4 (Business process model) without any notable variances over the years.

However, it should be noted that the results from 2020 and previous years not directly comparable with each other.

¹ The samples of IMAPS assessments results are not chosen as representative sample of all public services across the various countries. For this reason, the results cannot be directly compared against each other.

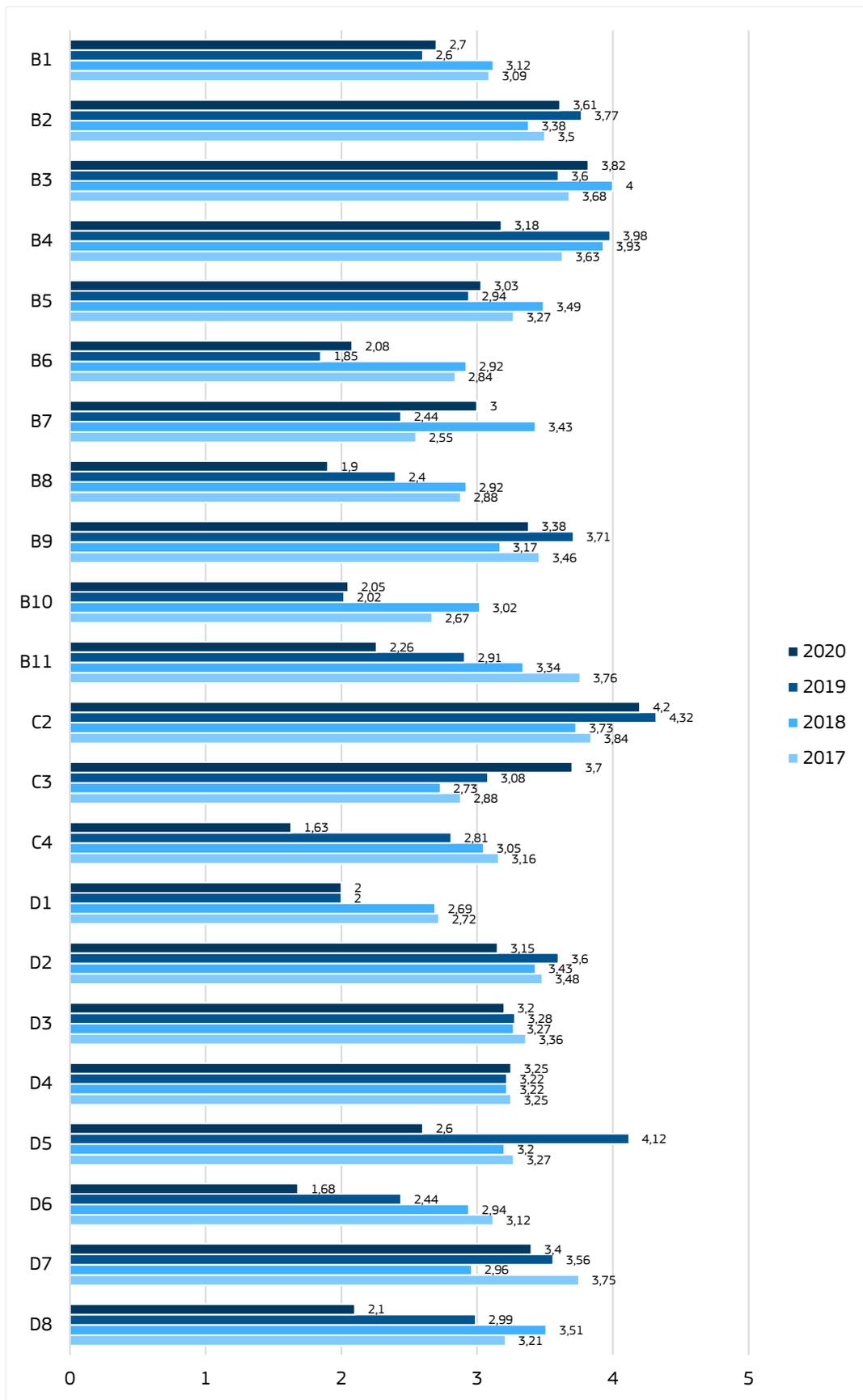


Figure 16: IMAPS results 2017-2020 by attribute

The following sections detail further the three areas of attributes: service delivery, service consumption and service management and the results achieved per attribute.

7.1. Service Delivery

Summary of highlights

Information on rules and processes underlying the digital public service is provided to end users and data privacy considerations are often transparent. Forms are partially pre-filled for a significant number of services, and service descriptions are based on semantic standards. Accessibility features for people with disabilities are insufficient. As regards multilingual features, in the majority of the cases the digital public service is only provided in one language. Delivery channels could also be diversified as digital public services are mainly provided in one digital and one traditional format.

This section assesses how the digital public services assessed deliver their services to end users such as citizens, businesses or other public administrations.

In the service delivery area 5 attributes out of 11 are below Essential level (3), as shown in **Figure 17**. The highest score is of 3.82.

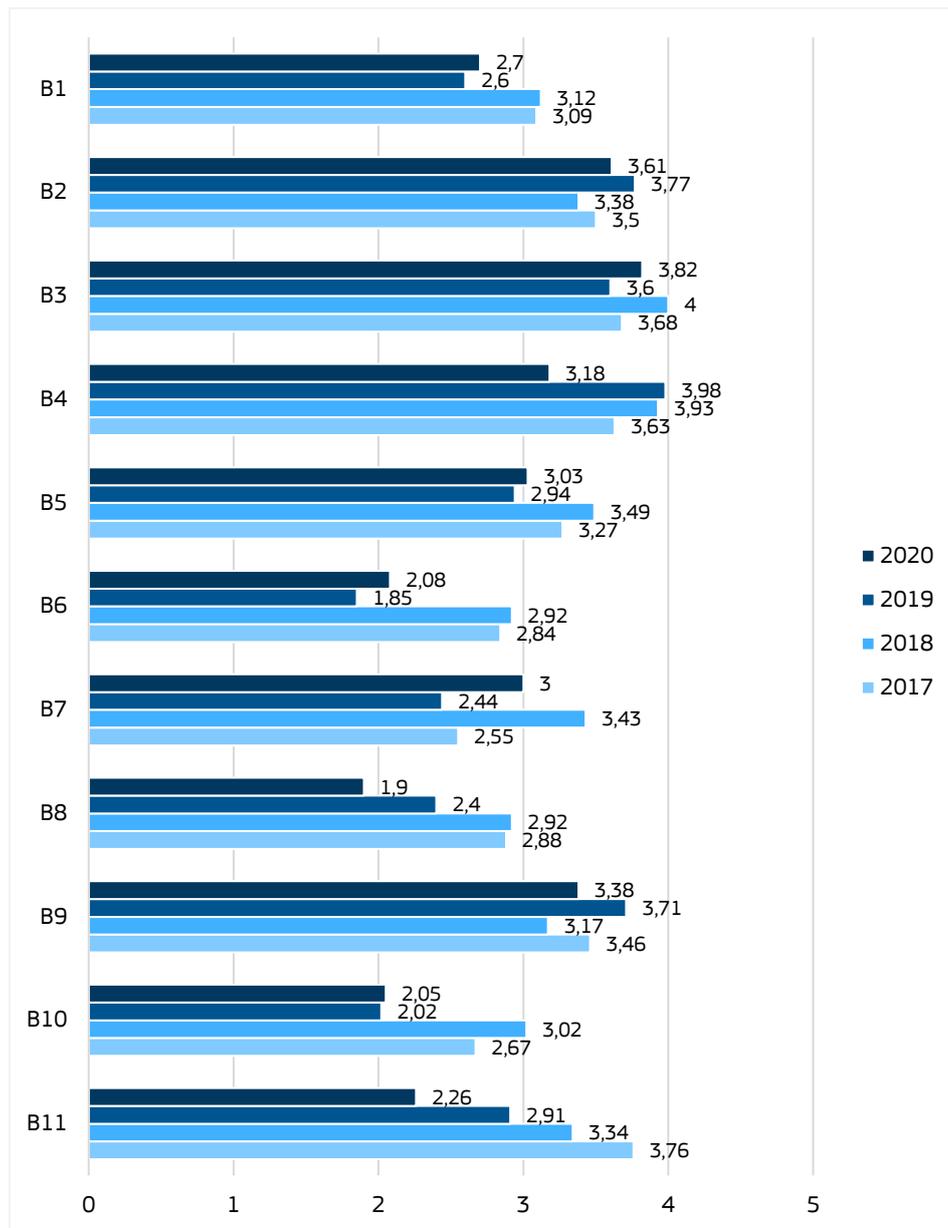


Figure 17: IMAPS results 2017-2020 – average scores for each service delivery attribute

Detailed data shows (**Figure 18**) that level 3.77 is the most often measured level (mode) of maturity for service delivery attributes. The maximum maturity level measured is 4.00 and the minimum is 1.24. On average (2.87), service delivery is below the Essential level 3.

When compared against 2019 results the year 2020 average, minimum, maximum and mode are lower.

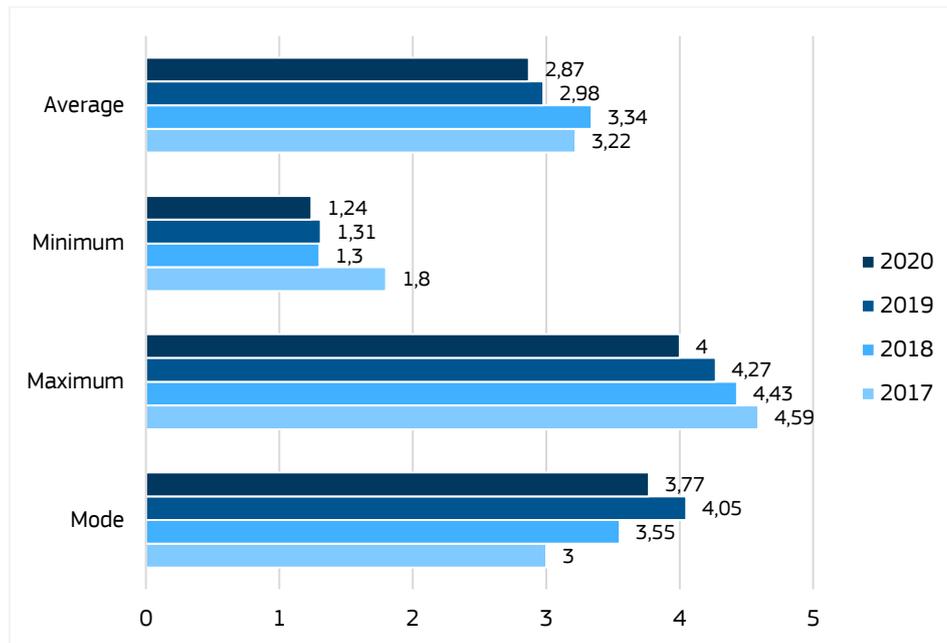


Figure 18: IMAPS results 2017-2020 – scores for all service delivery attributes - average, minimum, maximum, mode

Detailed assessment data shows that there are three service delivery attributes, which are better performing (with a score above 3.2) and three, which have average scores. **Table 7** details these attributes and analyses their relation to the European Interoperability Framework (EIF).

The interoperability maturity of service delivery is on relatively high level from procedural transparency, pre-filling and data exchange perspectives (average maturity scores between 3.38 and 3.82). Lower levels of maturity can be seen in multilingualism (1.9) and accessibility (2.08).

Table 7: Service delivery attribute landscape (2020)

#	Item	score	Analysis	EIF – related
Better performing service delivery attributes – scores > 3.2				
B3	Procedural transparency	3.82	The services are providing information on rules and processes underlying the digital public service towards its users.	Yes – transparency principle
B2	Pre-filling	3.61	Forms are partly pre-filled.	Yes – reusability principle
B9	Data exchange	3.38	The services leverage some open semantic standards for data exchange, combined with proprietary standards.	Yes – use of semantic specifications
Service delivery attributes – average scores between 3.2 and 2.8				

#	Item	score	Analysis	EIF — related
B4	Data privacy	3.18	Data privacy considerations are in many cases transparent to the users; limited information on data privacy is available.	Yes — data privacy principle
B5	User feedback	3.03	Users can provide their feedback on their user satisfaction with the service via digital or physical channels.	No
B7	Cross border service delivery	3.00	There are limited possibilities for non-residents or foreigners to use the digital public service.	Yes — purpose of the EIF: services cross-border by default
Service consumption attributes lagging behind — scores < 2.8				
B1	Delivery channels	2.70	The services are often available only through one digital and one traditional channel.	Yes — accessibility principle
B11	Certification	2.26	In many cases no certification procedure is available	No
B6	Accessibility	2.08	Some services provide some accessibility features for people with disabilities (e.g., visual, auditory, physical, cognitive), but they are in general only fairly compliant with an accessibility standard.	Yes — accessibility principle
B10	Service Catalogue	2.05	The services are in some cases registered in a catalogue, but this catalogue is only accessible to a restricted user group (i.e., the public service catalogue is not publicly available) and/or the service description is not based on standards such as CPSV-AP.	Yes — conceptual model
B8	Multilingualism	1.90	In the majority of the cases, the digital public service is only available in one language.	Yes — multilingualism principle

7.2. Service Consumption

Summary of highlights

Around 80% of the assessed services are consuming other services mainly or fully digitally. A selective number of relevant services are consumed from other public administrations, while they are available for reuse. The public services still rely substantially on manual intervention to integrate updates/up-to-date information or service flows.

This section assesses if and how services are consumed from other administrations and businesses. In the service consumption area, 1 attribute out of 3 is below Essential level (3) (see **Figure 19**). C2 receives the highest scores (4.2), which means that the manual or digital consumption of the services assessed is above seamless level (level 4).

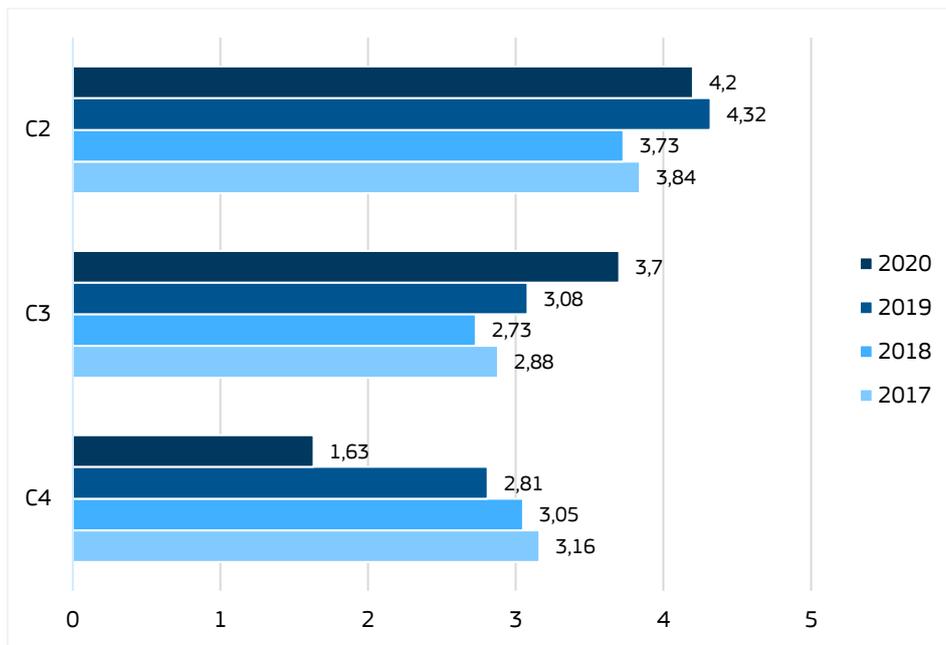


Figure 19: IMAPS results 2017-2020 – average scores for each service consumption attribute

Detailed assessment data shows (**Figure 20**) that level 3.77 is the most often measured level (mode) of maturity for service consumption attributes. The maximum maturity level measured is 5 — the highest possible. The minimum maturity level measured is 1.80. On average, service consumption is

above the Essential level 3. When compared against 2019 results the year 2020 average and mode are lower while minimum is higher and maximum the same.

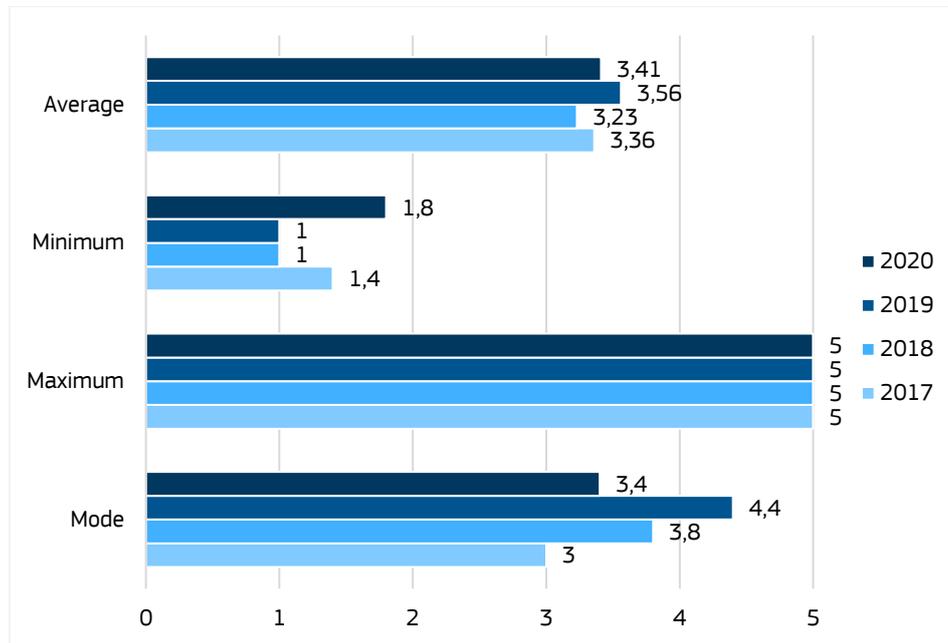


Figure 20: IMAPS results 2017-2020 – scores for all service consumption attributes – average, minimum, maximum, mode

Detailed data shows that there is one service consumption attribute, which is better performing (with a score above 4.2), one which has average scores and one which is lagging behind with score below 2.8. **Table 8** details these attributes and analyses their relation to the European Interoperability Framework (EIF).

The interoperability maturity of service consumption is on average above the Essential level in manual or digital consumption of services. Reusing or producing services is at Essential level. Maturity of subscription to updates is lagging behind (average maturity score 1.63).

Table 8: Service consumption attribute landscape (2020)

#	Item	score	Analysis	EIF – related
Better performing service consumption attributes – scores > 3.2				
C2	Manual or digital consumption of services	4.20	Around 80% of the assessed services are consuming other services mainly or fully digitally. Only a small number of services is still consuming other services manually rather than in digital/automated fashion.	Yes – end-to-end digital services
C3	Reusing or producing services	3.70	The services are currently only reusing a limited number of consumed services from other public administrations whilst they are available for reuse.	Yes – reusability principle

#	Item	score	Analysis	EIF – related
Service consumption attributes — average scores between 3.2 and 2.8				
NA	NA	NA	NA	NA
Service consumption attributes lagging behind — scores < 2.8				
C4	Subscriptions to updates	1.63	Currently, the public services still rely on systematic manual intervention to integrate updates/up-to-date information or service flows.	No

7.3. Service Management

Summary of highlights

Digital public services assessed are using increasingly common or standardised concept definitions and controlled vocabulary. Similarly, the service choreography is semi-automated, while in some cases manual intervention is still required. Business processes are increasingly streamlined. Components of the digital public services are partly procured based on interoperability standards.

On the other side, however, the (re-)use of existing architecture frameworks or sharing of contents and knowledge with the external environment only occurs in a limited number of cases.

Service Level Agreements (SLAs) are only used in some instances, and the specification process tends to be closed to participation from external stakeholders (i.e. other administrations, citizens, businesses).

This section assesses how the digital public service arranges the consumption and provisioning of external services and includes Service Management aspects such as architecture, procurement and service level management.

In the service management area, four attributes out of eight are below Essential level (3), as shown in **Figure 21**. The highest score is of 3.4.

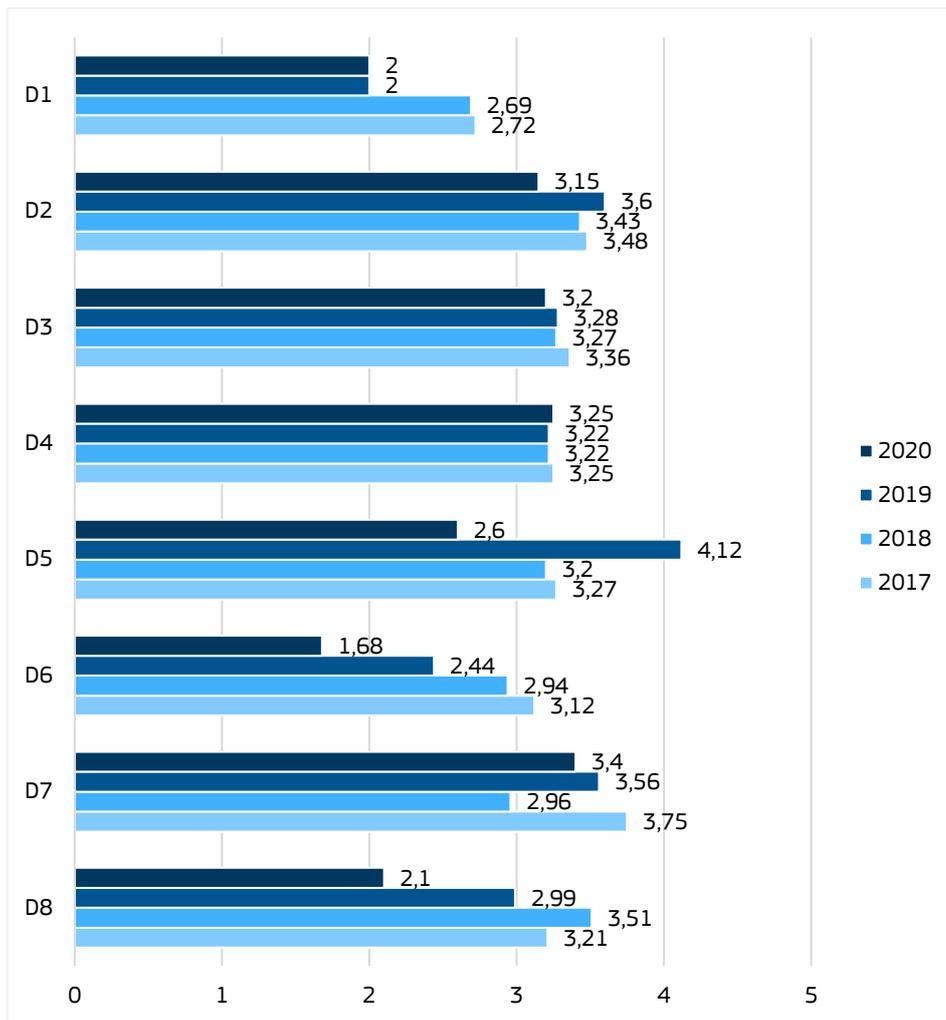


Figure 21: IMAPS results 2017-2020 – average scores for each service management attribute

Detailed assessment data shows (Figure 22) that level 2.05 is the most often measured level (mode) of maturity for service management attributes. The maximum maturity level measured is 4.05. The minimum maturity level measured is 1.25. On average, service management is below the Essential level 3. When compared against 2019 results the year 2020 average and mode are significantly lower, while the maximum is slightly lower and the minimum is at the same level.

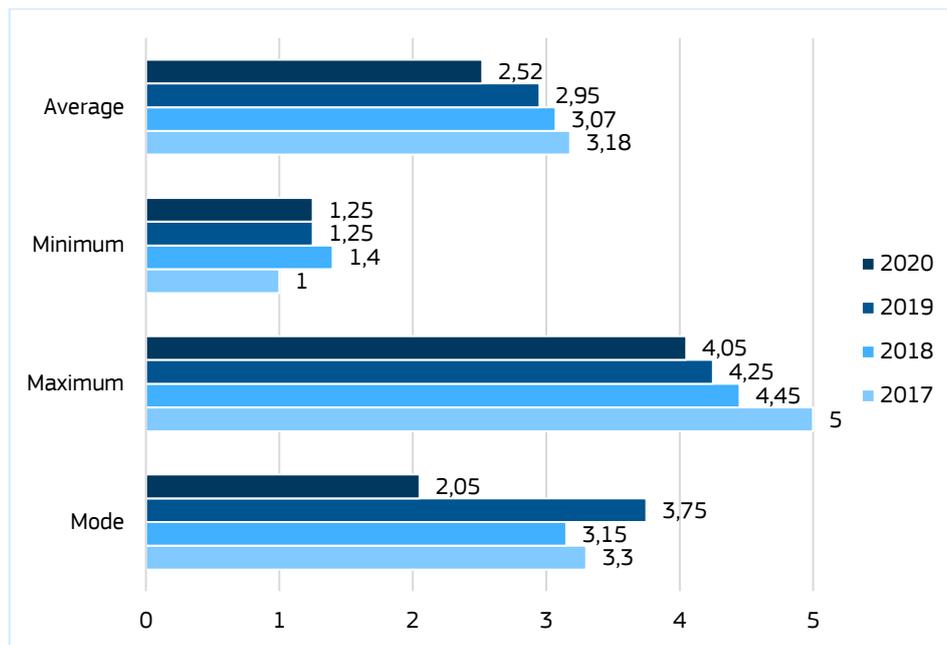


Figure 22: IMAPS results 2017-2020 – scores for all service management attributes – average, minimum, maximum, mode

Detailed assessment data shows that there are **three service delivery attributes which are top performing** (with a score above 3.4), one which has average scores and four which are lagging behind with scores below 2.8. **Table 9** details these attributes and analyses their relation to the European Interoperability Framework (EIF).

The interoperability maturity of service management is **on average above the Essential level** regarding concept definitions, service choreography and business process model (average maturity scores 3.25 – 3.40). The maturity of reuse and sharing of components and knowledge with the external environment is **lagging behind** (average maturity score 2.00). This is also the case for the existence of an architectural framework, interoperability agreements and specification process. The use of procurement criteria is at Essential level (3.15).

Table 9: Service management attribute landscape

#	Item	Score	Analysis	EIF – related
Better performing service management attributes – scores > 3.2				
D7	Concept definitions	3.40	While digital public services assessed are using common/standardised concept definitions and controlled vocabularies, there is still a number of services using some proprietary definitions.	Yes – semantic interoperability
D3	Service choreography	3.27	The service choreography of the digital public services is typically	No

#	Item	Score	Analysis	EIF — related
			semi-automated and still requires some manual interference.	
D4	Business process model	3.25	Business processes and rules are increasingly streamlined but not yet always according to Business Process Modelling standards.	Yes — process alignment recommendation
Service management attributes — average scores between 3.2 and 2.8				
D2	Procurement criteria	3.15	The digital public services' components still tend to be only partly procured based on standards.	Yes — technological neutrality and data portability principle
Service management attributes lagging behind — scores < 2.8				
D5	Architectural Framework	2.60	The use of existing enterprise architecture frameworks is not generalised for the design of digital public services.	Yes — use of EIRA
D8	Service Level Agreements (SLAs)	2.10	Only a minority of digital public services assessed are subject to SLAs and monitoring compliance.	Yes — interoperability agreements
D1	Reuse and sharing	2.00	Only in a small number of cases the assessed services share contents and knowledge with the external environment extensively ¹ .	Yes — reusability principle
D6	Specification process	1.68	The majority of services assessed do not open up their specification process to the participation by administrations, citizens and/or businesses. In some cases, stakeholders have been invited only once (without any regular participation).	Yes — openness principle

¹ “Extensively” refers to the respondents who told that they share contents and knowledge via three or all of the options below:

- Sharing documentation to provide other (related) organisations valuable insights into processes, organisation, governance, technology choices, etc.
- Sharing source code or downloadable software to enable other organisations to effectively build their services.
- Making available open Web-API services to enable other organisations and individuals to (re)use functionality and/or gain access to data via web and/or mobile apps.
- Providing support to organisations leveraging the resources provided

8

IMAPS RESULTS ON EIF IMPLEMENTATION

8. IMAPS results on EIF implementation

This section analyses the results in the light of the EIF implementation. **Table 10** maps the IMAPS attributes to the EIF dimensions used in the National Interoperability Framework Observatory (NIFO). While each attribute does not provide information on a complete dimension, it can give an indication on levels of implementation of a specific aspect of it.

As shown in **Table 10** IMAPS attributes related to the **transparency and reusability principles get the highest scores** in the 2020 results.

IMAPS attributes relating to the **principles** of technological neutrality and data portability, data privacy and reusability (reusing or producing services and prefilling) score above the Essential level.

IMAPS attributes relating to the **principles** of accessibility (accessibility), openness, reusability (reuse and sharing) and multilingualism score below the Essential level.

IMAPS attributes relating to the **interoperability levels**, i.e. semantic interoperability and process alignment recommendation, are above the Essential level.

IMAPS attributes relating to the **interoperability agreements** score below the Essential level.

The IMAPS attribute relating to the **interoperability governance** (use of an architecture framework) scores below the Essential level.

The IMAPS attribute relating to the **conceptual model** (service catalogue as part of the conceptual model) scores below the Essential level.

The IMAPS attribute relating to the **purpose of the EIF** (cross-border by default) scores at the Essential level.

Table 10: IMAPS assessment data contributing to the evaluation of the implementation of the EIF (2020)

EIF dimension		Score	#	Item
Principles	Transparency principle	3.82	B3	Procedural transparency
	Data privacy principle	3.18	B4	Data privacy
	Technological neutrality and data portability principle	3.15	D2	Procurement criteria
	Openness principle	1.68	D6	Specification process

EIF dimension		Score	#	Item
	Accessibility principle	2.70	B1	Delivery channels
		2.08	B6	Accessibility
	Multilingualism principle	1.90	B8	Multilingualism
	Reusability principle	3.70	C3	Reusing or producing services
		3.61	B2	Pre-filling
		2.00	D1	Reuse and sharing
Interoperability levels	Semantic interoperability	3.40	D7	Concept definitions
	Process alignment recommendation	3.25	D4	Process alignment recommendation
Interoperability Agreements	Use of semantic specifications	3.38	B9	Data exchange
	Interoperability agreements	2.10	D8	Service Level Agreements (SLAs)
Interoperability Governance	Use of the EIRA	2.60	D5	Architectural Framework
Conceptual model	Part of the conceptual model	2.05	B10	Service Catalogue
Purpose of the EIF	Cross-border by default	3.00	B7	Cross border service delivery

Legend	Underperforming: below level 3 Essential	Achieved the Essential level 3	Over-performing: in the top three high scores
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ANNEXES

Annexes

Annex 1. IMAPS attributes mapped to the European Interoperability Framework (EIF)

Interoperability Attributes

The IMAPS assesses each interoperability area using a set of interoperability attributes. These interoperability attributes form the core of the IMAPS and are used for measurement and improvement of interoperability maturity. This section explains how the interoperability attributes are defined and categorised.

Sources of input

Various related programmes and initiatives inside and outside ISA² have been leveraged to build the current set of Interoperability Attributes. The most important ones are:

- *European Interoperability Framework* — The European Interoperability Framework (EIF) serves as an important framework for organisations to promote and improve interoperability and therefore is considered as a paramount starting point for defining the Interoperability Attributes. To make this interrelation explicit, each interoperability attribute within the IMAPS is linked to one or more EIF-levels (aka technical interoperability, semantic interoperability, organisational interoperability and legal interoperability);
- *Digital Single Market* — the Digital Single Market strategy aims to open up digital opportunities for people and business and enhance Europe's position as a world leader in the digital economy. Select attributes were defined to align with this ambition; the terminology of the IMAPS overall embraces the key concepts of “digitalisation” in its various aspects;
- Alignment with various other ISA² initiatives — the IMAPS is continuously being aligned with and provides input into the following ISA² initiatives: EIRA ; TES ; NIFO ; CAMSS ; SEMIC ; Base registries ; ICT implications ; Sharing & Reuse ; IQAT ; EIRA .

IMAPS attributes mapped to the EIF

Table 11 provides a mapping of the IMAPS attributes (v1.1.1) with:

- The various levels of interoperability as described in the EIF (legal, organisational, semantic and technical)
- The elements in the EIF to which they are related (principles, etc.) aligned with the CAMSS EIF scenario.

Table 11: IMAPS assessment data contributing to the evaluation of the implementation of the EIF interoperability levels

#	Item	EIF interoperability level
B1	Delivery channels	Technical
B2	Pre-filling	Technical
B3	Procedural transparency	Organisational
B4	Data privacy	Legal
B5	User feedback	Organisational
B6	Accessibility	Technical
B7	Cross border service delivery	Organisational
B8	Multilingualism	Semantic
B9	Data exchange	Semantic
B10	Service Catalogue	Technical
B11	Certification	Organisational
C1	Landscaping Service Consumption	Organisational
C2	Manual or digital consumption of services	Technical
C3	Reusing or producing services	Technical
C4	Subscriptions to updates	Technical
D1	Reuse and sharing	Organisational
D2	Procurement criteria	Organisational
D3	Service choreography	Technical
D4	Business process model	Organisational
D5	Architectural Framework	Technical
D6	Specification process	Organisational
D7	Concept definitions	Semantic
D8	Service Level Agreements (SLAs)	Organisational

Table 12: IMAPS data contributing to the evaluation of the implementation of the EIF dimensions

EIF dimension		Item	
12 Principles	Subsidiarity and proportionality	N	
	Openness	Y	D6: specification process
	Transparency	Y	B3: Procedural transparency
	Reusability	Y	C3: Reusing or producing services B2: Pre-filling D1: Reuse and sharing
	Technological neutrality and data portability	Y	D2: Procurement criteria
	User-centricity	Y	B1: Delivery channels B5: User feedback
	Inclusion and accessibility	Y	B1: Delivery channels B6: Accessibility
	Security and privacy	Y	B4: Data privacy
	Multilingualism	Y	B8: Multilingualism
	Administrative simplification	Y	D3: Service choreography C2: Manual or digital consumption of services C4: Subscriptions to updates
	Preservation of information	Y	B4: Data privacy
Assessment of effectiveness and efficiency	Y	D2: Procurement criteria D6: Specification process	
Interoperability levels	Semantic interoperability	Y	D7: Concept definitions
	Process alignment recommendation	Y	D4: Business process model
Interoperability Agreements	Use of semantic specifications	Y	B9: Data exchange
	Interoperability agreements	Y	D8: Service Level Agreements (SLAs)
Interoperability Governance	Use of the EIRA	Y	D5: Architectural Framework

EIF dimension			Item
Conceptual model	Part of the conceptual model	Y	B10: Service Catalogue
Purpose of the EIF	Cross-border by default	Y	B7: Cross border service delivery

Annex 2. IMAPS attributes and related manifestations and enablers

The table below shows the mapping of manifestations and enablers to IMAPS attributes (v1.1.1) and presents the average score per IMAPS attribute for the 2020 results.

#	Item	Manifestation	Enabler	Average score 2020 results
B1	Delivery channels	Y		2.70
B2	Pre-filling	Y		3.61
B3	Procedural transparency	Y		3.82
B4	Data privacy		Y	3.18
B5	User feedback	Y		3.03
B6	Accessibility	Y		2.08
B7	Cross border service delivery	Y		3.00
B8	Multilingualism	Y		1.90
B9	Data exchange		Y	3.38
B10	Service Catalogue		Y	2.05
B11	Certification Organisational		Y	2.26
C1	Landscaping Service Consumption	Y		N/A
C2	Manual or digital consumption of services		Y	4.20
C3	Reusing or producing services		Y	3.70
C4	Subscriptions to updates		Y	1.63
D1	Reuse and sharing		Y	2.00

#	Item	Manifestation	Enabler	Average score 2020 results
D2	Procurement criteria		Y	3.15
D3	Service choreography		Y	3.20
D4	Business process model		Y	3.25
D5	Architectural Framework		Y	2.60
D6	Specification process		Y	1.68
D7	Concept definitions	Y		3.40
D8	Service Level Agreements (SLAs)		Y	2.10

Annex 3. IMAPS attributes and related recommendations for enhancing interoperability

The table below provides the recommendations per IMAPS attribute and interoperability maturity level (v1.1.1).

Question	Assessed level	Next level	Recommendation
B.1 Delivery channels	Ad Hoc (1)	Essential (3)	Not all end users will be able to use your service due to the fact only one digital channel is available as access point to it. In order to ensure accessibility to all end users, the addition of a traditional channel would be beneficial.
	Essential (3)	Sustainable (4)	In addition to one digital and one traditional channel, your service could improve its accessibility by adding more digital channels.
	Sustainable (4)	Seamless (5)	Frontrunners use interactive digital collaboration tools such as a virtual agents based on artificial intelligence to provide 24/7 direct interactions towards end users. Investigate the possibilities of adding such features to the current set of service delivery channels.
	Ad Hoc (1)	Essential (3)	Currently, your service does not require pre-filling or does not make use of pre-filling.

Question	Assessed level	Next level	Recommendation
B.2 Form pre-filling			<p>If the former is the case, periodically evaluate whether pre-filling is not becoming relevant as your service evolves.</p> <p>For both cases, consult peer practices in order to make sure that you don't miss out on opportunities to pre-fill. Evaluate and map the different sources that you could use for pre-filling. Run user testing if appropriate to define which fields could be pre-filled and what impact the pre-filling has.</p>
	Sustainable (4)	Seamless (5)	Your digital public service provides detailed information on data privacy to users. However it is currently not possible for the user to manage (some of this) data privacy information online. This is though considered a desirable end state. As a first step, analyse which fields are important for the end user to manage by defining and testing a set of use cases.
B3. Procedural transparency	Ad Hoc (1)	Essential (3)	Currently, your service does not provide information on rules & processes to its end users. This may negatively impact the perception of your service and might lead to wrong assumptions and/or expectations of end users. Map all information that would be beneficial to end users (such as decision mechanisms, lead times, and reporting obligations) and communicate these via the available channels.
	Essential (3)	Seamless (5)	Currently, your service is providing limited information on rules & processes. Map all information that would be beneficial to end users (such as decision mechanisms, lead times, and reporting obligations) and communicate these via the available channels.
B4. Data privacy	Ad Hoc (1)	Essential (3)	Currently, end users are not provided with any information on data privacy. This is however essential in fostering users' trust in the digital public service. Map all information that would be beneficial to end users and communicate these via the available channels.
	Essential (3)	Sustainable (4)	Currently, end users are only provided with a subset of information on their data privacy. Map all information that would be beneficial to end users and focus on closing the gaps to ensure full transparency.

Question	Assessed level	Next level	Recommendation
	Sustainable (4)	Seamless (5)	Your digital public service provides detailed information on data privacy to users. However it is currently not possible for the user to manage (some of this) data privacy information online. This is though considered a desirable end state. As a first step, analyse which fields are important for the end user to manage by defining and testing a set of use cases.
B5. User feedback	Ad Hoc (1)	Essential (3)	At this moment your digital public service does not provide the possibility to give feedback. This is though beneficial to capture information on areas for improvement and/or insight into the particular strengths of the digital public service. Ensure you have a physical and/or digital channel available to capture this information and/or address complaints.
	Essential (3)	Sustainable (4)	Your digital public service has a physical feedback mechanism available to users (e.g., phone, postal). Consider adding a digital channel to capture feedback. Options are a dedicated email address, functionality via the website or a live chat function. Having a digital feedback channel reduces end user effort and likely enhances the amount and detail of feedback you will receive.
	Sustainable (4)	Seamless (5)	Currently, your digital public service offers the possibility for feedback. It would be beneficial to provide additional insights into the (anonymised) feedback from other end users. This way, end users will have a clear view of the quality of the functionalities offered, their limitations and are able to learn from each other's user experiences.
B6. Accessibility	Ad Hoc (1)	Essential (3)	Currently, your digital public service is not equally accessible to all end users. Implement accessibility features to make navigation, information and interaction with the digital public service convenient for people with disabilities. Consider an accessibility standard such as Web Content Accessibility (WAI) Guidelines 2.0, level AA for this purpose.
	Essential (3)	Seamless (5)	Although your digital public services provides some accessibility features, it is not fully compliant with an accessibility standard such as Web Content Accessibility (WAI) Guidelines 2.0, level AA. Work towards implementing an accessibility standard to the full extent to ensure your digital public service can obtain the conformance (compliance) logo.

Question	Assessed level	Next level	Recommendation
B.7 Cross border service delivery	Ad Hoc (1)	Seamless (5)	At this moment there are restriction for non-residents or foreigners using the digital public service. Determine how many users are potentially impacted by this and draft a plan to ensure cross border service delivery by opening up the digital public service to foreign users (requiring e.g., alternative authentication mechanisms).
B.8 Multilingualism	Ad Hoc (1)	Essential (3)	Your digital public service is not multilingual. Consider at a minimum offering a multi-lingual interface. Offer it in one or several languages which best reflect the composition of your user community. You may start with offering multilingual basic information first, and then expand the scope of the translation.
	Essential (3)	Seamless (5)	Currently, some of the pages and/or documentation are multilingual. Whilst this is a good starting point, you may consider providing the entire service (including functional and technical documentation) in multiple languages. Make use of automated translation tools to achieve this goal. Consider collaborating with pan-European peers to spread burden, streamline functionalities and make multilingualism an integral part of your service delivery strategy.
B.9 Data Exchange	Ad Hoc (1)	Essential (3)	Currently, your digital public service is only using proprietary standards and is not leveraging existing (open) semantic standards for data exchange. Consider using (open) semantic standards to improve the interoperability of your digital public service with the outside environment.
	Essential (3)	Seamless (5)	Your digital public service leverages some (open) semantic standards for data exchange but combines this with proprietary standards. Investigate if it will be possible for your service to move towards a situation where the data exchange is entirely based on existing (open) semantic standards and specifications. Eliminating the reliance on proprietary-defined data flows will improve the interoperability of your digital public service significantly.
B.10 Service Catalogue	Ad Hoc (1)	Opportunistic (2)	Currently, your digital public service is not registered in a Service Catalogue. Registering your public service within a catalogue is recommended to promote and increase the usage of the service.

Question	Assessed level	Next level	Recommendation
	Opportunistic (2)	Essential (3)	Your digital public service is registered in a catalogue only accessible to a restricted user group. Consider leveraging a publicly available catalogue to reach a larger target audience.
	Essential (3)	Sustainable (4)	Your digital public service is registered in a publicly available catalogue but is not discoverable online. Ensuring online discoverability is important to promote the machine-to-machine consumption of the digital public service. Focus on providing interoperable machine readable descriptions of the public service such as the contact details, public service info, provider, eligibility criteria and required input or evidences. Leverage standards such as CPSV-AP to ensure a solution that fits the needs of potential users.
	Sustainable (4)	Seamless (5)	Your digital public service is registered in a publicly and online discoverable catalogue and includes a public service description. However at this moment you are not (fully) leveraging standards such as CPSV-AP. Adopting these standards will help in the delivery of interoperable public service descriptions and group services according to life or business events.
B.11 Certification	Ad Hoc (1)	Seamless (5)	<p>You are providing your digital public service towards other administrations and/or organisations without a certification procedure. As a result, you create the risk of interconnections not working properly e.g., in terms of security, governance, technological and semantic interoperability and availability.</p> <p>Consider developing a formalised certification procedure in order to ensure your service can be delivered in a stable and safe manner to end users.</p>
C.2 Manual or digital consumption of services	Sliding scale (when not already seamless) — 5 levels		You are currently consuming all, most or some of the services manually. You could enhance your interoperability by 'digitalizing' the consumption further. This will create benefits in the areas of data quality, throughput time, costs and interoperability. Fully digital consumption of services also enables straight through processing and/or real-time processing. Try to find ways to interact more digitally with related organisations and define business cases to understand the added value of digitalization compared to manual interactions.

Question	Assessed level	Next level	Recommendation
C.3 Reusing or producing services	Sliding scale (when not already seamless) — 3 levels		You are currently not consuming all relevant services from other public administrations whilst they are available for reuse. This shows that you are not making use of existing services to increase the effectiveness and efficiency of your own digital public service. Elaborate why this is the case. Before producing your own services, always take the time to map existing ones to possibly adapt them for your own purposes. Understand how you can improve your view on which services are being provided by other organisations.
C.4 Subscriptions to updates	Ad Hoc (1)	Essential (3)	At this moment, all updates stemming from other services require manual intervention. This means manual effort and potentially quality issues. Determine the business case for improving the automatic processing of updates in terms of efficiency, quality, responsiveness and security. Start with (life) events that have the highest impact on the functioning of the digital public service.
	Essential (3)	Seamless (5)	Currently, your digital public service still relies on some manual intervention when it receives updates. This means manual effort and potentially quality issues. Determine the business case for improving the automatic processing of updates in term of efficiency, quality, responsiveness and security. Proceed with (life) events that have the highest impact on the functioning of the digital public service.
D.1 Reuse and sharing	Sliding scale (when not already seamless) — 5 levels	D.1 Reuse and sharing	Currently, your digital public service shares no or only some components and knowledge with the external environment. Work towards reuse and sharing on four areas: <ol style="list-style-type: none"> 1. Provisioning of open Web-API services 2. Sharing source code and/or downloadable software components (including required licensing) 3. Sharing documentation 4. Provisioning of knowledge (direct Q&A support)
D.2 Procurement criteria	Ad hoc (1)	Essential (3)	At this moment, your public service does not use a set of defined procurement criteria to steer on reuse and interoperability. Institutionalising a set of criteria or principles would benefit the service and administration because common pitfalls

Question	Assessed level	Next level	Recommendation
			(e.g., proprietary development while services are available for reuse) can be prevented.
	Essential (3)	Seamless (5)	Although there is a set of defined procurement criteria, not all components have been procured based on standards. Focus on strict enforcement to ensure that procurement criteria are an effective steering mechanism to foster greater interoperability.
D.3 Service choreography	Ad hoc (1)	Essential (3)	Currently, your digital public service does not have an automated service choreography. This means that all the coordination with external services is highly dependent on manual actions, potentially implying quality issues. Determine the business case for improving the automatic service choreography in term of efficiency, quality, responsiveness and security. Start with automating the choreography for services that have the highest impact on the functioning of the digital public service.
	Essential (3)	Seamless (5)	Currently, the service choreography of your digital public services is semi-automated and still requires some manual interference. This means manual effort and potentially quality issues. Determine the business case for improving the automation of service choreography in terms of efficiency, quality, responsiveness and security. Proceed with automating the choreography for services that have the highest impact on the functioning of the digital public service.
D.4 Business process model	Ad Hoc (1)	Essential (3)	At this stage, you do not have coherent business process definitions and rules in place. This means that in day-to-day operations, your collaboration with other services is governed ad hoc, burdening your own and other services' organisation. Consider putting in place a more manageable, consistent framework for establishing business processes, in particular where interdependencies between organisations are considerable.
	Essential (3)	Sustainable (4)	Business processes and rules are increasingly streamlined but not yet according to Business Process Modelling standards. Identify which standards in your domain are relevant to implement and leverage the best practices and lessons learned.
	Sustainable (4)	Seamless (5)	Processes are modelled to conform to business process standards but the whole process is still performed in a silo. Leveraging the insights of

Question	Assessed level	Next level	Recommendation
			partners (of the consumed and/or shared services) can benefit you substantially in working towards a future proof interoperable process flow in your domain.
D.5 Architectural Framework	Ad hoc (1)	Seamless (5)	<p>Consider leveraging existing frameworks in your domain for the design of your digital public service and integrate their principles in the target state architecture to ensure proper steering and guidance. Consider implementing best practices in architectural flexibility such as the European Interoperability Reference Architecture and web-service based solutions to optimise your architecture further.</p> <p>References:</p> <p>European Interoperability Reference Architecture: https://joinup.ec.europa.eu/asset/eia/home</p> <p>TOGAF http://pubs.opengroup.org/architecture/togaf9-doc/arch/</p> <p>NORA: http://www.noraonline.nl/wiki/Hoofdpagina</p>
D.6 Specification process	Ad Hoc (1)	Essential (3)	Currently, your digital public service does not provide the opportunity to other external organisations to participate in the specifications process. Opening up the specification process would have a series of benefits: upfront alignment in terms of interoperability with other services; learning and good practice sharing with other organisations; identification of additional opportunities to further foster interoperability, etc. Thus consider opening up the specification process.
	Essential (3)	Sustainable (4)	Within the specification process, stakeholders have been invited once to express their concerns. There is however no periodic process in which stakeholders are invited more regularly to ensure that the continuous development of the digital public service also addresses their (future) needs. Determine a suitable frequency to interact with stakeholders based on the speed of development of your digital public service.
	Sustainable (4)	Seamless (5)	The specification process of your public service is “upon invitation only.” This is selective and you risk excluding organisations which could well be willing to participate. You should consider opening up the specifications process to a wider

Question	Assessed level	Next level	Recommendation
			public. To do so, carefully assess the benefits of doing so (creating an environment of continuous knowledge sharing; ensuring the widest possible interoperability) against any possible disadvantages (such as increasing the specification process' complexity). Think of innovative collaborative tools (Web 2.0) to at least partly web-enable the specification process.
D.7 Concept definitions	Ad Hoc (1)	Seamless (5)	At this moment your digital public service is using proprietary definitions. The use of common concepts and definitions ensures alignment between organisations. Consider leveraging common/standardised concept definitions and controlled vocabularies (e.g., code lists, thesauri).
D.8 Service Level Agreements (SLAs)	Ad Hoc (1)	Essential (3)	Currently, your digital public service is not using Service Level Agreements (SLAs) to make the expected service performance transparent and predictable for users. Ensuring SLAs and institutionalizing a Service Level Management process is considered a good practice and helps the organisation to steer on service stability and outcome. Leverage existing frameworks such as ITIL v3 for the implementation of this process.
	Essential (3)	Seamless (5)	As part of the Service Level Management process, good practice organisations monitor the compliance monthly and provide reports to their users to indicate compliance or provide an overview of the corrective actions that were taken to restore the service.

Annex 4. Distribution analysis of the results per attribute

The following tables allow to assess whether the IMAPS survey results for the years 2017 to 2020 follow a normal distribution, based on kurtosis and skewness.

Note that: Values outside the +/- 1 range for skewness and +/-3 for kurtosis are deemed as departures from normality.

It has been found for the 2020 results that:

- All (sic) attributes apart from Questions C2 and D6 follow a normal distribution. This allows to make the analysis at the 2nd order level.

- In case of Question C2 the skewness is -1.60 which represents a departure from normality;
 - In case of Question D6 the skewness is 1.52 which represents a departure from normality.
- Only Service Delivery follows a normal distribution.

Table 13: Analysis of distribution: IMAPS areas (2020 results)

Service Delivery	Service Delivery	Service Consumption	Service Management
Average	2.87	3.41	2.52
Minimum	1.24	1.80	1.25
Maximum	4.00	5.00	4.05
Mode	3.77	3.40	2.05
Median	2.88	3.40	2.55
Standard Deviation	0.59	0.70	0.62
Kurtosis	-0.01	0.14	0.12
Skewness	-0.20	0.02	0.37

Table 14: Distribution of IMAPS attributes (2020 results)

#	Std. Deviation	Count	Variance	Kurtosis	Skew-ness	Normal?
B1	1.47	40	2.16	-1.68	-0.09	Yes
B2	1.87	33	3.5	0.11	-0.82	Yes
B3	1.94	34	3.76	0.05	-0.90	Yes
B4	1.91	34	3.65	-0.62	-0.46	Yes
B5	1.33	40	1.77	-1.15	-0.62	Yes
B6	1.63	37	2.65	0.18	0.79	Yes
B7	2.00	40	4	-2.11	0.00	Yes
B8	1.18	40	1.4	0.01	0.93	Yes
B9	1.94	37	3.76	-0.86	-0.48	Yes
B10	1.43	40	2.04	-1.11	0.78	Yes
B11	1.98	35	3.92	-0.72	0.72	Yes
C2	1.08	40	1.16	2.44	-1.60	No ¹
C3	1.45	40	2.1	-0.82	-0.64	Yes
C4	1.39	32	1.96	1.93	0.94	Yes
D1	0.00	40	0	N/A	N/A	N/A
D2	1.64	40	2.68	-1.53	-0.14	Yes
D3	0.98	40	0.96	1.19	0.23	Yes
D4	1.09	40	1.18	0.35	-0.97	Yes
D5	1.96	40	3.84	-1.92	0.41	Yes
D6	1.23	40	1.51	1.11	1.52	No ²
D7	1.96	40	3.84	-1.92	-0.41	Yes
D8	1.67	40	2.78	-0.77	1.00	Yes

¹ The skewness for question C2 deviates from normality (-1.60).

² The skewness for question D6 deviates from normality (1.52).

Table 15: Distribution of IMAPS attributes (2017 results)

#	Std. Deviation	Count	Variance	Kurtosis	Skew-ness	Normal? ¹
B1	1.44	67	2.07	-1.18	-0.31	Yes
B2	2.11	56	4.41	-0.84	-0.63	Yes
B3	1.88	59	3.53	0.36	-0.98	Yes
B4	2.12	54	4.49	-0.77	-0.63	Yes
B5	1.45	67	2.1	-1.05	-0.71	Yes
B6	1.70	61	2.89	-0.32	-0.39	Yes
B7	1.95	67	3.8	-1.83	0.46	Yes
B8	1.65	67	2.72	-1.55	0.11	Yes
B9	1.43	65	2.01	1.05	-0.77	Yes
B10	1.21	67	1.46	-1.38	-0.20	Yes
B11	2.48	55	6.1	-1.61	-0.40	Yes
C2	1.00	67	1.21	-0.43	-0.47	Yes
C3	1.46	51	2.13	-1.12	0.09	Yes
C4	2.21	67	4.88	-1.31	-0.22	Yes
D1	1.17	67	1.36	-0.73	0.40	Yes
D2	1.25	67	1.56	-0.58	-0.22	Yes
D3	1.29	67	1.66	-0.63	-0.19	Yes
D4	1.24	67	1.53	-0.40	-0.63	Yes
D5	1.98	67	3.92	-1.98	-0.27	Yes
D6	1.45	67	2.1	-1.24	-0.47	Yes
D7	1.86	67	3.42	-1.36	-0.80	Yes
D8	1.55	67	2.4	-1.33	-0.18	Yes

¹ Values outside the +/- 1 range for skewness and +/- 3 for kurtosis are considered deviations from normality.

Table 16: Distribution of IMAPS attributes (2018 results)

#	Std. Deviation	Count	Variance	Kurtosis	Skew-ness	Normal? ¹
B1	1.35	51	1.82	-0.92	-0.40	Yes
B2	1.75	47	3.02	0.38	-0.85	Yes
B3	1.98	46	3.88	0.51	-1.22	No ²
B4	2.12	45	4.49	-0.19	-1.03	No ³
B5	1.29	51	1.69	0.09	-1.19	No ⁴
B6	1.63	49	2.65	-0.51	-0.26	Yes
B7	1.95	51	3.8	-1.87	-0.44	Yes
B8	1.58	51	2.55	-1.42	0.07	Yes
B9	1.64	47	2.68	0.55	-0.77	Yes
B10	1.11	51	1.26	-0.55	-0.55	Yes
B11	2.51	41	6.25	-1.66	-0.36	Yes
C2	1.28	51	1.68	-0.35	-0.76	Yes
C3	1.43	51	2.08	-1.01	0.21	Yes
C4	2.12	40	4.49	-1.06	-0.40	Yes
D1	1.36	51	1.9	-0.99	0.35	Yes
D2	1.45	51	2.13	-1.02	-0.35	Yes
D3	1.19	51	1.44	-0.20	-0.05	Yes
D4	1.19	51	1.45	-0.25	-0.70	Yes
D5	1.99	51	4.04	-2.04	-0.20	Yes
D6	1.59	51	2.58	-1.65	-0.20	Yes
D7	2.00	51	4.08	-2.08	0.04	Yes
D8	1.47	51	2.21	-1.04	-0.44	Yes

¹ Values outside the +/- 1 range for skewness and +/- 3 for kurtosis are considered deviations from normality.

² The skewness for question B3 deviates from normality (-1.22).

³ The skewness for question B4 deviates from normality (-1.03).

⁴ The skewness for question B5 deviates from normality (-1.19).

Table 17: Distribution of IMAPS attributes (2019 results)

#	Std. Deviation	Count	Variance	Kurtosis	Skew-ness	Normal?
B1	1.65	50	2.72	-1.64	0.28	Yes
B2	1.92	44	3.68	0.72	0.32	Yes
B3	1.98	43	3.92	-0.43	0.28	Yes
B4	1.71	47	2.92	1.33	0.33	Yes
B5	1.39	50	1.96	-1.45	0.28	Yes
B6	1.32	47	1.74	0.28	0.33	Yes
B7	1.92	50	3.68	-1.71	0.28	Yes
B8	1.51	50	2.28	-1.04	0.28	Yes
B9	1.77	48	3.13	-0.11	0.29	Yes
B10	1.14	50	1.29	-1.43	0.28	Yes
B11	2.26	44	5.1	-1.64	0.28	Yes
C2	0.97	50	0.94	1.95	-1.47	No ¹
C3	1.60	50	2.56	-1.45	-0.07	Yes
C4	1.95	43	3.8	-0.96	-0.02	Yes
D1	0.00	50	0	N/A	N/A	N/A
D2	1.40	50	1.96	-0.84	-0.49	Yes
D3	1.27	50	1.61	-0.50	-0.49	Yes
D4	1.55	50	2.4	-1.35	-0.49	Yes
D5	1.66	50	2.75	-0.06	-0.49	Yes
D6	1.50	50	2.25	-1.40	-0.49	Yes
D7	1.92	50	3.68	-1.71	-0.49	Yes
D8	0.72	50	0.52	-0.77	-0.25	Yes

¹ The skewness for question C2 deviates from normality (-1.47).

Annex 5. Service consumption

The table below shows the number of consuming services of the digital public services (attribute C1) assessed for the years 2017, 2018 and 2019.

Table 18: Number of services consumed (2017-2019) for attribute C1

#	2017	2018	2019	2020
Total number of IMAPS assessments	67	51	50	40
Authentication Service	41 (61%)	34 (67%)	40 (80%)	32 (80%)
Data Exchange Service	26 (39%)	25 (49%)	26 (52%)	16 (40%)
Logging Service	24 (36%)	24 (47%)	23 (46%)	9 (23%)
Hosting Service	25 (37%)	24 (47%)	23 (46%)	11 (28%)
Networking Service	22 (33%)	22 (43%)	21 (42%)	8 (20%)
Data Validation Service	20 (30%)	20 (39%)	19 (38%)	12 (30%)
Storage Service	19 (28%)	19 (37%)	18 (36%)	11 (28%)
Access Management Service	18 (27%)	18 (35%)	17 (34%)	9 (23%)
eSignature Service	17 (25%)	17(33%)	16 (32%)	8 (20%)
Base Registry Information Source	17 (25%)	17 (33%)	17 (34%)	12 (30%)
Administration and Monitoring Service	16 (24%)	16 (31%)	16 (32%)	3 (8%)
Data Transformation Service	15 (22%)	15 (29%)	14 (28%)	12 (30%)
Forms Management Service	15 (22%)	16 (31%)	14 (28%)	3 (8%)
Messaging Service	21 (31%)	21 (41%)	20 (40%)	13 (33%)
Document Management Service	15 (22%)	14 (27%)	15 (30%)	9 (23%)
ePayment Service	12 (18%)	12 (24%)	12 (24%)	12 (30%)
Metadata Management Service	12 (18%)	12 (24%)	12 (24%)	8 (20%)
Audit Service	11 (16%)	11 (22%)	11 (22%)	7 (18%)
Registration Service	11 (16%)	10 (20%)	11 (22%)	2 (5%)

#	2017	2018	2019	2020
Content Management Service	10 (15%)	10 (20%)	10 (20%)	6 (15%)
Records Management Service	9 (13%)	9 (18%)	9 (18%)	1 (3%)
eArchiving Service	9 (13%)	9 (18%)	9 (18%)	1 (3%)
eTimestamp Service	8 (12%)	8 (16%)	8 (16%)	9 (23%)
Data Publication Service	7 (10%)	7 (14%)	7 (14%)	1 (3%)
eSeal Service	6 (9%)	6 (12%)	6 (12%)	1 (3%)
Trust Registry Service	5 (7%)	5 (10%)	5 (10%)	0 (0%)
Test Service	5 (7%)	5 (10%)	5 (10%)	2 (5%)
Business Reporting Service	4 (6%)	4 (8%)	4 (8%)	5 (13%)
Partner Management Service	4 (6%)	4 (8%)	4 (8%)	1 (3%)
Service Discovery Service	4 (6%)	4 (8%)	4 (8%)	0 (0%)
Audio-visual Service	3 (4%)	3 (6%)	3 (6%)	3 (8%)
Machine Translation Service	3 (4%)	3 (6%)	3 (6%)	0
Business Analytics Service	3 (4%)	2 (4%)	3 (6%)	5 (13%)
Registered Electronic Delivery Service	3 (4%)	3 (6%)	3 (6%)	1 (3%)
Configuration and Cartography Service	3 (4%)	3 (6%)	3 (6%)	2 (5%)
Orchestration Service	2 (3%)	2 (4%)	2 (4%)	0 (0%)
Choreography Service	1 (1%)	1 (2%)	1 (2%)	3 (8%)
eArchiving Service	9 (13%)	9 (18%)	9 (18%)	1 (3%)
Other Service	5 (7%)	5 (10%)	5 (10%)	0 (0%)

Annex 6. IMAPS attributes' mapping to EIRA building blocks

Table 19 maps the IMAPS attributes (v1.1.1) to the EIRA building blocks as per EIRA version 3.1.0¹ showing whether there is equivalence between the two in terms of meaning, even though the terminology used in the IMAPS versus the EIRA may not fully be consistent. A future version of the IMAPS will provide updates regarding the naming of attributes and the conventions of enablers and manifestations in order to align with EIRA Building Blocks' definitions, as well as with the naming convention of ISA² key enablers.

Table 19: IMAPS attributes and related categories

#	IMAPS Attribute Name	Is there an equivalent or related ² EIRA Building Block: Y/N	If yes, EIRA term for the Building Block
B1	Delivery channels	Y, related	Service delivery model Human Interface Machine to Machine Interface
B2	Pre-filling	N	Machine to Machine Interface
B3	Procedural transparency	N	Exchange of Business Information
B4	Data privacy	Yes, related	Privacy Service
B5	User feedback	N	Human Interface Machine to Machine Interface
B6	Accessibility	N	Data Syntax
B7	Cross border service delivery	Y, related	Service delivery model
B8	Multilingualism	Y, related	Machine Translation Service
B9	Data exchange	Y, related	Semantic Interoperability specification
B10	Service Catalogue	Y, equivalent	Public Service Catalogue
B11	Certification	Y, related	Human Interface
C1	Landscaping Service Consumption	Y, included in the example listing of services that can be consumed as per the IMAPS are the	Access Management Service Audit Service

¹ https://ec.europa.eu/isa2/news/european-interoperability-architecture-presents-eira-v310-and-egovera-solution_en

² Related refers to having a relationship with the meaning of the IMAPS attribute. Here, the EIRA attribute should be used to refine the definition of the IMAPS attribute. Equivalent means that the IMAPS attribute and the EIRA attribute already define the same aspect of interoperability and that thus their "names" should be aligned.

#	IMAPS Attribute Name	Is there an equivalent or related ² EIRA Building Block: Y/N	If yes, EIRA term for the Building Block
		following EIRA Building Blocks	Trust Registry Service (partly overlapping with the IMAPS's eSignature service in meaning) e-Payment Service Data Transformation Service Data Validation Service Machine Translation Service Data Exchange Service Forms Management Service Metadata Management Service Networking Service Hosting Service Storage Service
C2	Manual or digital consumption of services	N	
C3	Reusing or producing services	N	
C4	Subscriptions to updates	N	
D1	Reuse and sharing	N	
D2	Procurement criteria	N	
D3	Service choreography	Y, equivalent	Digital Service infrastructure
D4	Business process model	Y, related	Business Capability
D5	Architectural Framework	N	
D6	Specification process	Y, related	Interoperability specification
D7	Concept definitions	Y, related	Data model
D8	Service Level Agreements (SLAs)	Y, related	Organisational Interoperability agreement

Annex 7. IMAPS types of services assessed (2017-2019)

This annex presents the types of digital public services which were assessed between 2017 and 2019.

Table 20: IMAPS results 2017-2018 – Types and description of services assessed

Type of public service	Description of public services assessed
Base Registry	<ul style="list-style-type: none"> ▪ Centrally provided data
Citizenship	<ul style="list-style-type: none"> ▪ Citizen's folder ▪ Residence information service ▪ Certificates, e.g., births/marriages
Commercial/business support	<ul style="list-style-type: none"> ▪ Information service for businesses ▪ Permission related service ▪ Provisioning of information related to business related procedure ▪ Trade related applications ▪ Business financial information services
Criminal records	<ul style="list-style-type: none"> ▪ Application of citizens' criminal records ▪ Court case information provisioning
Data/document provisioning	<ul style="list-style-type: none"> ▪ Provisioning of data/documents for organisations
Decision making support	<ul style="list-style-type: none"> ▪ Decision making/cooperation improvement related services
Education	<ul style="list-style-type: none"> ▪ Application for study programs ▪ Education related information services
Financial	<ul style="list-style-type: none"> ▪ Fund information ▪ Payment/refund services
Geospatial	<ul style="list-style-type: none"> ▪ Provisioning of geospatial data
Government portal providing several services	<ul style="list-style-type: none"> ▪ Government portal providing various services
Healthcare	<ul style="list-style-type: none"> ▪ Healthcare information service
Internal support services	<ul style="list-style-type: none"> ▪ HR services
IT services	<ul style="list-style-type: none"> ▪ Supporting services aimed at enabling online interaction of citizens and businesses with various government agencies.
Law related	<ul style="list-style-type: none"> ▪ Law related services
Local general services	<ul style="list-style-type: none"> ▪ Web based services for citizens
Medical/health	<ul style="list-style-type: none"> ▪ Healthcare related information registries/services
Procurement	<ul style="list-style-type: none"> ▪ Digital procurement service

Type of public service	Description of public services assessed
Recruitment/employment	<ul style="list-style-type: none"> Recruitment services for citizens/government offices
Social care	<ul style="list-style-type: none"> Social care online applications Social care related data provisioning to citizens
Statistics related services	<ul style="list-style-type: none"> Provisioning of statistical information
Taxation	<ul style="list-style-type: none"> Customer contribution to taxation Tax return services Tax related information provisioning to customers Tax payment service
Tourism	<ul style="list-style-type: none"> Digital tourism related services
Transportation	<ul style="list-style-type: none"> Information about public transportation Transportation data provisioning

Table 21: IMAPS results 2019 – Types and description of services assessed

Type of public service	Description of public services assessed
Citizenship	<ul style="list-style-type: none"> Provisioning of certificates, e.g., births/marriages Access to information from citizens' registry
Commercial/Business support	<ul style="list-style-type: none"> Trade related applications Applications for grants Provisioning of information related to business related procedure
Criminal records	<ul style="list-style-type: none"> Application for citizens' criminal records
Data/document provisioning	<ul style="list-style-type: none"> Provisioning of data/documents Provisioning of open data services
Education	<ul style="list-style-type: none"> Application for study programme Education related application services (for students) Online access to study programme
Employment	<ul style="list-style-type: none"> Declaration of unemployment status Provisioning of financial data in the context of retirement Provisioning of special allowance to employees
Financial	<ul style="list-style-type: none"> Financial services
Government Portal	<ul style="list-style-type: none"> Government Portal providing various services
Healthcare	<ul style="list-style-type: none"> Healthcare information service
IT services	<ul style="list-style-type: none"> Supporting services aimed at enabling online interaction of citizens and businesses with various government agencies

Type of public service	Description of public services assessed
	<ul style="list-style-type: none"> Public repository and portal for dissemination of information Authentication service for citizens
Law related	<ul style="list-style-type: none"> Submission of citizen's complaint
Medical/health	<ul style="list-style-type: none"> Healthcare related information registries/services
Procurement	<ul style="list-style-type: none"> Digital procurement service
Social care	<ul style="list-style-type: none"> Social care online applications
Taxation	<ul style="list-style-type: none"> Tax related information provisioning
Transportation	<ul style="list-style-type: none"> Provision of driving license

Annex 8. IMAPS value contribution to the Single Digital Gateway

This annex lists the 21 administrative procedures that all EU Member States should provide fully online (cross-border) to citizens and businesses by December 2023 according to the Single Digital Gateway (SDG) Regulation (EU Regulation 2018/1724¹).

Table 22: Single Digital Gateway – administrative procedures to be digital by default

Life event	Description of administrative procedures
Birth	<ul style="list-style-type: none"> Requesting proof of registration of birth
Residence	<ul style="list-style-type: none"> Requesting proof of residence
Studying	<ul style="list-style-type: none"> Applying for a tertiary education study financing, such as study grants and loans from a public body or institution Submitting an initial application for admission to public tertiary education institution Requesting academic recognition of diplomas, certificates or other proof of studies or courses
Working	<ul style="list-style-type: none"> Request for determination of applicable legislation in accordance with Title II of Regulation (EC) No 883/2004 Notifying changes in the personal or professional circumstances of the person receiving social security benefits, relevant for such benefits

¹ REGULATION (EU) 2018/1724 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012

Life event	Description of administrative procedures
	<ul style="list-style-type: none"> ▪ Application for a European Health Insurance Card (EHIC) ▪ Submitting an income tax declaration
Moving	<ul style="list-style-type: none"> ▪ Registering a change of address ▪ Registering a motor vehicle originating from or already registered in a Member State, in standard procedures ▪ Obtaining stickers for the use of the national road infrastructure: time-based charges (vignette), distance-based charges (toll), issued by a public body or institution ▪ Obtaining emission stickers issued by a public body or institution
Retiring	<ul style="list-style-type: none"> ▪ Obtaining emission stickers issued by a public body or institution ▪ Requesting information on the data related to pension from compulsory schemes
Starting, running and closing a business	<ul style="list-style-type: none"> ▪ Notification of business activity, permission for exercising a business activity, changes of business activity and the termination of a business activity not involving insolvency or liquidation procedures, excluding the initial registration of a business activity with the business register and excluding procedures concerning the constitution of or any subsequent filing by companies or firms within the meaning of the second paragraph of Article 54 TFEU ▪ Registration of an employer (a natural person) with compulsory pension and insurance schemes ▪ Registration of employees with compulsory pension and insurance schemes ▪ Submitting a corporate tax declaration ▪ Notification to the social security schemes of the end of contract with an employee, excluding procedures for the collective termination of employee contracts ▪ Payment of social contributions for employees

Annex 9. SIAG solutions

This annex presents the key features of the four interoperability assessment solutions, developed under the ISA² programme, which are part of the Single Interoperability Assessment Gateway:

- **IMAPS:** Interoperability Maturity Assessment of a Public Service
- **CAMSS:** Common Assessment Method for Standards and Specifications
- **IQAT:** Interoperability Quick Assessment Toolkit
- **ITB:** Interoperability Test Bed

Table 23: Presentation of SIAG solutions

IMAPS	IQAT	CAMSS	ITB
You are...			
<ul style="list-style-type: none"> ▪ IT Requirements Manager ▪ Public Procurement Officer ▪ Policy-maker ▪ IT Solutions Portfolio Manager ▪ Public Service Owner 	<ul style="list-style-type: none"> ▪ Software/ Application Architect & Developer ▪ Public Service Owner 	<ul style="list-style-type: none"> ▪ IT Requirements Manager ▪ IT Software/ Application Architect & Developer ▪ Public Procurement Officer ▪ Policy-maker ▪ IT Solutions Portfolio Manager 	<ul style="list-style-type: none"> ▪ IT Requirements Manager ▪ IT Application/ Software Architect & Developer ▪ Public Procurement Officer
You are looking for a solution to...			
<p>Diagnose the interoperability maturity of a <u>digital public service</u> regarding its behavioural aspects and identify improvement opportunities.</p>	<p>Quickly assess the potential interoperability of a <u>solution</u> supporting a digital public service in structural terms (interoperability governance and software architecture).</p>	<p>Assess <u>standards and specifications</u> for the design and development of interoperable systems supporting the public service.</p>	<p>Validate content or perform self-service conformance testing of an <u>IT system</u> against one or more technical or semantic specifications.</p>
<p><u>IMAPS</u> allows you to test the EIF conformance of your digital public services (front- or back-office) from a <i>behavioural</i> perspective.</p>	<p><u>IQAT</u> allows you to evaluate the structural interoperability maturity level of their digital public service.</p>	<p><u>CAMSS</u> allows you to you to assess the conformance of your standards and specifications with the EIF or the interoperability requirements set out in the standardisation <u>Regulation 1025/2012</u>.</p>	<p>By testing conformance against configured interoperability specifications (semantic or technical), <u>ITB</u> allows you thus to also test the EIF conformance of your IT system implementation.</p>

IMAPS	IQAT	CAMSS	ITB
You will get...			
<p>IMAPS provides you with an online self-assessment questionnaire (EUSurvey) and guidelines.</p> <p>IMAPS produces an interoperability maturity score and recommendations.</p> <p>IMAPS is available in specialised versions which allow you to focus on legal (LIMAPS), organisational (OIMAPS), semantic (SIMAPS) and technical (TIMAPS) behavioural interoperability aspects of your digital public service.</p>	<p>IQAT provides you with an online self-assessment questionnaire (EUSurvey) and guidelines.</p> <p>IQAT produces an interoperability maturity score and recommendations.</p>	<p>CAMSS provides you a method for assessing the interoperability of standards and specifications.</p> <p>CAMSS produces a catalogue of assessments with reports.</p>	<p>ITB provides you with online (or on-premise) data validators and a conformance testing platform.</p> <p>ITB produces conformance testing reports and certificates.</p>
Start now!			
<p>Download the latest release of IMAPS (v1.2.0).</p> <p>Complete the IMAPS online survey.</p> <p>For more information, please visit IMAPS on Joinup.</p>	<p>Download the latest release of IQAT (v2.0.0).</p> <p>Complete the IQAT online survey.</p> <p>For more information, please visit IQAT on Joinup.</p>	<p>Download the latest release of CAMSS (v3.0.0).</p> <p>For more information, please visit CAMSS on Joinup.</p>	<p>Use the shared ISA² instance or download the ITB's latest software release (v1.9.1).</p> <p>For more information, please visit ITB on Joinup.</p>
Get inspired!			
<p>IMAPS was used for the interoperability maturity assessment of the European mobility job portal (EURES), e-justice portal and various digital public services of European public administrations (e.g. e-health information service, online tax payment service, social care online application,</p>	<p>IQAT was used for the interoperability assessment of a solution that facilitates the exchange of structured electronic documents.</p>	<p>CAMSS was used for SAML 2.0, OWL 2, OAuth 2.0, OAS 3.0 and Assessment of the Open Standards for Linking Organizations (OSLO²).</p>	<p>ITB is used by numerous projects including the Connecting Europe Facility (CEF) eInvoicing, the European Single Procurement Document (ESPD), Business Registers Interconnection Systems (BRIS), Insolvency Registers Interconnection (IRI), Interoperability Model for Land Registers (IMOLA), European Interoperability Reference</p>

IMAPS	IQAT	CAMSS	ITB
online public procurement service).			Architecture (EIRA) and DCAT Application Profiles for Europe (DCAT-AP).

Annex 10. IMAPS support to the Tallinn Declaration

This annex presents an analysis made on whether the policy action lines included in the Tallinn Declaration are relevant to the activities conducted by the IMAPS action. **Table 24** presents the Tallinn Declaration policy actions lines, the actors responsible for the implementation of each policy line (i.e., Member States, Commission or EU Institutions) and whether the policy line is relevant to the activities performed by the IMAPS (i.e., Yes or No). When the policy line is relevant or maybe relevant to the Trans European Systems (TES) action, comments on the analysis are added to a dedicated column.

Table 24: Impact of the Tallinn Declaration

Policy action line	Responsible actor(s)	Relevant to the IMAPS Action?	Comments
Digital-by-default, inclusiveness and accessibility			
Provide citizens and businesses with the option to interact digitally with public administrations, if they choose to, while following the “User-centricity principles for design and delivery of digital public services” as set out in the Annex of this declaration;	Member States	Yes	IMAPS supports digital interactions as well as following the user centricity principles as it is a tool to improve interoperability aspects of a digital service.
Take steps to reduce the need for citizens and businesses to unnecessarily interact with public administrations, for example, by relying on (re)use of data;	Member States	Yes	IMAPS assessment and related recommendations direct public services to reuse data/other services.
Take steps to further increase the readiness of citizens and businesses to interact digitally with public administrations by developing their digital skills as well as promoting the available digital public services (including cross-border ones);	Member States	No	
Ensure better digital accessibility of public services and information for all citizens and businesses, including by improving the accessibility of public	Member States	Yes	IMAPS tool promotes usage of several digital channels as well as e.g., services in

Policy action line	Responsible actor(s)	Relevant to the IMAPS Action?	Comments
administration websites and mobile apps;			multiple languages and also for people with disabilities.
Take steps to enable seamless digital delivery of services across sectors and collaboration in public service provision, by allowing EU institutions, private sector and civil society linkages to information held in public administration databases and systems in appropriate policy areas.	Member States	Yes	IMAPS' main focus is on improving interoperability which greatly focuses on seamless service delivery and collaboration.
Adopt the digital-by-default principle and commitments similar to the annexed "User-centricity principles for design and delivery of digital public services" for all service interactions with EU institutions — by 2019.	Commission and other EU institutions	No	One of the use cases for IMAPS is to use the tool already in the planning phase of digital services. This is in accordance with digital-by-default principle.
Once only			
Take steps to identify redundant administrative burden in public services and introduce once only options for citizens and businesses in digital public services by collaboration and data exchange across our administrations at national, regional and local level as well as with other countries for cross-border digital public services;	Member States	Yes	IMAPS promotes e.g., reuse of existing data and digital services. IMAPS can be used by administrations at national, regional and local level as well as for cross-border digital services.
Take steps to increase the findability, quality and technical accessibility of data in key base registers and/or similar databases, to build up readiness for applying the once only principle for national or cross-border digital public services;	Member States	Yes	IMAPS promotes e.g. re-use of existing data and digital services, usage of Service Catalogues and e.g., certifications that support in ensuring working interconnections.
Work to create a culture of reuse, including responsible and transparent reuse of data within our administrations;	Member States	Yes	IMAPS promotes the culture of reuse of data and digital services.
Make use of available funding to digitise all necessary key data and implement data exchange services between administrations for applying once only on both national and/or cross-border levels.	Member States	No	

Policy action line	Responsible actor(s)	Relevant to the IMAPS Action?	Comments
Step up the work to define the organisational and technical steps necessary for applying the once only principle to key cross-border digital public services in support of the Single Market, building on the results from pilot projects and programmes;	Commission	No	
Further explore possibilities of Standard Business Reporting in view of the implementation of the ESMA European Single Electronic Format to make company data comparable, transparent and accessible digitally to reduce administrative burdens;	Commission	No	
Apply the once only principle for the EU-level digital public services they own and coordinate, in all policy areas — by 2022.	EU institutions	Yes	IMAPS promotes the culture of reuse of data and digital services.
Trustworthiness and Security			
Speed up preparations in our countries to ensure timely implementation and promote the widespread use across sectors of the Regulation on electronic identification (eID) and trust services for electronic transactions in the internal market (eIDAS), including to undertake the voluntary notification of electronic identity schemes used for access to public services at earliest possibility;	Member States	No	
Work to make our digital public services secure and properly identifiable by using the eIDAS framework for qualified electronic trust services, including by advancing the take-up of qualified website authentication certificates and qualified electronic seals;	Member States	Yes	The interoperability of eID services can be improved by proper use of IMAPS toolset.
Enable the private sector to make use of national eID schemes and trust services in securing the delivery of their digital services, where beneficial to the citizen, including by the further development of single sign-on, mandates and delegations;	Member States	Yes	The interoperability of eID services can be improved by proper use of IMAPS toolset.

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Coordinate, exchange and collaborate more with each other to increase our strategic, operational, research and development capacity in the area of cybersecurity, in particular via the implementation of the network and information security (NIS) directive to strengthen the security and resilience of our public administration and services.	Member States	No	Coordinate, exchange and collaborate more with each other to increase our strategic, operational, research and development capacity in the area of cybersecurity, in particular via the implementation of the network and information security (NIS) directive to strengthen the security and resilience of our public administration and services.
Work jointly with our countries to develop proposals on how take EU research and development funding more into use for the development of cybersecurity and privacy tools and technologies and their deployment in the public administration — in 2018;	Commission	No	Work jointly with our countries to develop proposals on how take EU research and development funding more into use for the development of cybersecurity and privacy tools and technologies and their deployment in the public administration — in 2018;
Take steps to increase the recognition of eIDAS compliant solutions by global market players, in particular, for notified electronic identification means and qualified website authentication certificates, and to provide support to accelerate the uptake of those services for cross-border activities	Commission	No	Take steps to increase the recognition of eIDAS compliant solutions by global market players, in particular, for notified electronic identification means and qualified website authentication certificates, and to provide support to accelerate the uptake of those services for cross-border activities
Continue promoting the development and use of standards that ensure uniform conditions for the implementation of eIDAS Regulation.	Commission	No	Continue promoting the development and use of standards that ensure uniform conditions for the implementation of eIDAS Regulation.
Openness and transparency			
Make it possible for citizens and businesses to digitally manage their personal data held by the public	Member States	Yes	IMAPS supports transparency and reuse of data.

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administration (e.g., access, check and inquire about the use of, submit corrections to, authorise (re)use of), at least for base registries and/or similar databases;			
Increase the availability and quality of open government data that is of value to economy and society, including by adopting the open-by-default approach and enabling more the automatic linkages to databases (for example, by application programming interfaces)	Member States	Yes	IMAPS supports improving interoperability of digital services. E.g., better reusability of services is partly enabled by improving APIs.
Take steps to ensure long-term reservation of public information resources in a cost-effective way by taking it into consideration in design of public administration ICT solutions.	Member States	Yes	IMAPS supports reuse of data and digital services. This improves cost efficiency.
Make it easier for citizens and businesses to fully digitally manage (e.g., access, check and inquire about the use of, submit corrections to, authorise (re)use of) their personal data that EU institutions hold — by the end of 2020;	EU institutions	Yes	Accessibility of digital services is one of the IMAPS assessment areas. Accessibility ensures that people with all abilities and disabilities can perceive, understand, navigate, and interact with the digital public service.
Take the lead and involve Member States in preparing an initiative on accessibility and reuse of public and publicly funded data, based on the evaluation of existing legislation and subject to an impact assessment, and further explore the possibility of opening up privately held data of public interest, as proposed in the Digital Single Market midterm review — by spring 2018	Commission	No	Take the lead and involve Member States in preparing an initiative on accessibility and reuse of public and publicly funded data, based on the evaluation of existing legislation and subject to an impact assessment, and further explore the possibility of opening up privately held data of public interest, as proposed in the Digital Single Market midterm review — by spring 2018
Become more active in the area of open government at global level, to advance this transformation and relevant mutual learning across the world.	Commission	No	Become more active in the area of open government at global level, to advance this transformation and relevant mutual learning across the world.

Policy action line	Responsible actor(s)	Relevant to the IMAPS Action?	Comments
Interoperability by default			
Enhance the reuse of emerging joint solutions under the Connecting Europe Facility (CEF) programme or other common frameworks — in particular eID, eSignature, eDelivery, eProcurement and eInvoicing and promote their implementation in more domains, while avoiding sectoral duplication of service infrastructures;	Member States	Yes	IMAPS supports reuse of data and digital services as well as certifications/standardization.
Make more use of open source solutions and/or open standards when (re)building ICT systems and solutions (among else, to avoid vendor lock-ins), including those developed and/or promoted by EU programmes for interoperability and standardisation, such as ISA2	Member States	Yes	IMAPS is an action of ISA2 programme and focuses on improving interoperability of digital services.
Make ICT solutions owned by or developed for the public administrations more readily available for reuse in private sector and civil society, for example, by developing and publishing terms and conditions on how third parties may reuse the solutions.	Member States	Yes	IMAPS tool supports improving both reuse and reusability of digital services.
Implement the European Interoperability Framework and the Interoperability Action Plan (including within all Commission services), especially for cross-border services within the Single Market — by the end of 2021;	EU institutions	Yes	IMAPS is an action of ISA2 programme and focuses on improving interoperability of digital services. The European Interoperability Framework has been leveraged to build the current set of IMAPS Interoperability Attributes.
Discuss cross-border interoperability principles and work to reach relevant agreements with global partners, especially the eIDAS framework for global interoperability and mutual recognition of electronic identities and trust services	Commission	No	
Building on the Council Conclusions on mainstreaming digital solutions and technologies in EU development	Commission	Yes	IMAPS can support this activity by providing information and analysis on

Policy action line	Responsible actor(s)	Relevant to the IMAPS Action?	Comments
policy, to submit proposals on how to fully integrate digital considerations into the EU's external development policy support instruments, to ensure interoperability with EU frameworks and standards when third countries make investments to digital infrastructure and services with EU assistance — by the end of 2019			the state of the interoperability in the digital services assessed by using IMAPS.
Consider strengthening the requirements for use of open source solutions and standards when (re)building of ICT systems and solutions takes place with EU funding, including by an appropriate open licence policy — by 2020.	Commission	No	
Horizontal enabling policy steps			
Take steps to increase the digital leadership skills among top civil and public servants and digital skills more widely within the public administration at all levels, as a necessary precondition to any successful digital transformation of public administrations;	Member States	Yes	One of the use cases for IMAPS is analysis of the level of interoperability and related root causes based on the assessment data gathered. This supports improvement of digital skills and competence.
Prepare and implement initiatives to widen and deepen the use of data and analytics (including big data) in our countries to move to data-driven public services and make full use of data for better decision-making;	Member States	Yes	IMAPS supports reuse of data and digital services.
Commit to expand and deepen the exchange and sharing of good eGovernment practices and successful domestic solutions, to speed up the digital transformation at all levels of government — including by enhancing the joint governance structures with local and regional authorities	Member States	Yes	IMAPS supports sharing of good practices and information about solutions as well as improvement of interoperability by publishing assessment result analysis reports, providing specific recommendations for individual services and e.g., publishing success stories from IMAPS users.
Make efforts to ensure adequate and timely funding resources for the prioritised digital transformation in our public administrations, at all levels	Member States	No	

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Devote resources for more and faster experimentation with emerging ICT within the public administration, including by the offering of ‘testbeds’ for researchers and businesses	Member States	No	
Work to modernise the design of public services, procurement and contracting arrangements, to make them compatible with modern and agile ways of developing and deploying digital technology	Member States	Yes	IMAPS supports use of standards in IT procurement.
Improve the inter-institutional cooperation and step up individual efforts for thorough digital transformation of their organisations, following the EU eGovernment Action Plan and the European Interoperability Framework principles	EU institutions	Yes	IMAPS supports the improvement of interoperability of digital services. The European Interoperability Framework has been leveraged to build the current set of IMAPS Interoperability Attributes.
Building on the Council Conclusions on mainstreaming digital solutions and technologies in EU policy, to fully integrate digital considerations into existing and future policy and regulatory initiatives	Commission	No	
Prepare a roadmap on how to fully embrace digital transformation for all Commission-managed funding distribution processes, which is a key area of red tape right now — by 2018;	Commission	No	
Launch initiatives to improve digital skills more widely within its services, especially the digital leadership skills among management — by the end of 2018	Commission	No	
Take steps to harmonise and consolidate indicators of eGovernment progress in the EU across policy areas, including to reinforce the coordination with statistical work of Eurostat	Commission	No	
Prepare proposals on the future (post 2020) and sustainability of existing EU level cross-border digital service infrastructures and building blocks,	Commission	Yes	Data gathered via IMAPS assessments can be used for future proposals regarding cross border digital service

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including their funding and management, in anticipation of the end of the current Connecting Europe Facility programme and based on the experiences and evaluation of the large scale pilots — within the process of the next EU multiannual financial framework preparations			infrastructure and building blocks. Various aspects related to the state of interoperability of digital public services can be analysed via the assessment data.
Convene and support the work of groups of interested countries and other parties to exchange practices and develop reference guidelines and standards for taking emerging ICT into use in the public administration, for example, starting with data analytics, artificial intelligence and blockchain	Commission	Yes	Interoperability is an important viewpoint also in taking emerging ICT into use. IMAPS supports making services interoperable by design.
Support our countries in the digital transformation of our public administrations, including by making resources more and easily available through EU-level instruments for research and practical deployment of emerging ICT in the public administration, with due attention for connected ethical issues.	Commission	Yes	The IMAPS action provides the IMAPS survey tool to support in the digital transformation of public administrations across Member States and the Commission especially from interoperability perspective.

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ISA² is a EUR 131 million programme of the European Commission which develops digital solutions that enable interoperable cross-border and cross-sector public services, for the benefit of public administrations, businesses and citizens across the EU. ISA² supports a wide range of activities and solutions, among which is the Interoperability Maturity Assessment of a Public Service (IMAPS) action.

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