

## **ISA Action 4.1.2: Interoperability Maturity Model**

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### **D03.02 - IMM Recommendations**

15 March 2017

*Specific contract SC 371 under framework contract No DI/07170*

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# 1 Introduction

The main objective of the IMM is to provide insight into how digital public services can improve their interoperability maturity. After filling in the online questionnaire, the respondent receives a PDF with advice on how to improve the interoperability of his digital public service. This report discusses how these recommendations are generated.

## 1.1 Principles

The following five principles are applied to generate recommendations:

- **Principle 1:** Each interoperability attribute differentiates between at least two maturity levels;
- **Principle 2:** The improvement tables provide recommendations on how to improve maturity gradually for a specific interoperability attribute;
- **Principle 3:** When a digital public service does not yet reach the maximum level for a specific interoperability attribute, a recommendation is given to make the step towards the next interoperability level;
- **Principle 4:** When a digital public service successfully attains the maximum maturity level for an interoperability attribute, no recommendation is given<sup>1</sup>;
- **Principle 5:** When the maturity improvement is not based on specific interoperability characteristics per level, a sliding scale (e.g. from less to more) is used. In this scenario, a generic recommendation (not maturity level specific) is given to improve the maturity further along the sliding scale.

## 1.2 Recommendation overview

For each improvement step, the recommendation tables in the following chapters show:

- The question the recommendation relates to;
- The assessed maturity level;
- The next maturity level to be reached through improvement<sup>2</sup>;
- The recommendation as to how to reach the next maturity level.

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<sup>1</sup> The reason for this is that in this case- according to the model- the service is already implementing an interoperability attribute in a way that it corresponds to best practice. There are no direct recommendations to improve further.

<sup>2</sup> With the exception when this is a considered a sliding scale.

## 2 Service Delivery (B)

### 2.1 Scoring Table

	Ad hoc (1)	Opportunistic (2)	Essential (3)	Sustainable (4)	Seamless (5)
<b>B.1 (15%)</b>	One digital channel		One digital and one traditional channel	Multiple digital and traditional channels	Multiple digital (including interactive digital collaboration) and traditional channels
<b>B.2 (15%)</b>	No pre-filling		Partial pre-felling		Full pre-filling Not applicable
<b>B.3 (10%)</b>	No procedural transparency		Partial procedural transparency		Full procedural transparency Not applicable
<b>B.4 (10%)</b>	No privacy information		Partial privacy information	Complete privacy information	Complete privacy information and user management Not applicable
<b>B.5 (5%)</b>	No user feedback mechanism		Physical feedback channel	Digital feedback channel	Digital feedback channel and insight into others' feedback
<b>B.6 (5%)</b>	Unequal access		Partially equal access		Full compliance with web accessibility standards Not applicable
<b>B.7 (5%)</b>	Restrictions towards foreigners / non nationals				No restrictions
<b>B.8 (10%)</b>	Unilingual		Partially multilingual		Fully multilingual
<b>B.9 (10%)</b>	No, only proprietary standards		Partly, based on open semantic standards		Fully, based on open semantic standards
<b>B.10 (10%)</b>	Not in catalogue	In catalogue with restricted audience	Publicly available catalogue	Discoverable and descriptions	Discoverable and descriptions using standards
<b>B.11 (5%)</b>	No, certification procedure available		Yes, a certification		Not applicable, certification is not required for

			procedure is available		users to access the digital public service
					Not applicable

**Table 1: Scoring Table 'Service Delivery'**

## 2.2 Recommendations

Question	Assessed level	Next level	Recommendation
<b>B.1 Delivery channels</b>	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 24x7 direct interactions towards end users. Investigate the possibilities of adding such features to the current set of service delivery channels.
<b>B.2 Form pre-filling</b>	Ad Hoc (1)	Essential (3)	<p>Currently, your service does not require pre-filling or does not make use of pre-filling.</p> <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>
	Essential (3)	Seamless (5)	<p>Your service pre-fills selected, but not all data fields which would be electronically available. Pre-filling is one of the strongest manifestations of interoperability as it adds significant value to users in terms of reducing user burden and speeding up the service request process. Within your administration, pre-filling minimises the risk of erroneous data entries.</p> <p>Map all information that would be electronically available and design your service to consume it electronically. Start with authentic sources first, but also consider using sources of information</p>

			which do not have this formal status, but possibly offer similar added value.
<b>B3. Procedural transparency</b>	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.
<b>B4. Data privacy</b>	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.
	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.
<b>B5. User feedback</b>	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 e-mail 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.
<b>B6. Accessibility</b>	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.
<b>B.7 Cross border service delivery</b>	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>B.8 Multilingualism</b>	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>B.9 Data Exchange</b>	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>B.10 Service Catalogue</b>	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.
	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>B.11 Certification</b>	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>

Table 2: Recommendations ‘Service Delivery’



## 3 Service Consumption (C)

### 3.1 Scoring Table

	Ad hoc (1)	Opportunistic (2)	Essential (3)	Sustainable (4)	Seamless (5)
<b>C.1 (0%)</b>	No score				
<b>C.2 (40%)</b>	Fully manually	Mainly manually, some digitally	Mix of manual and digital consumption	Mainly digitally, some manually	Fully digitally
<b>C.3 (30%)</b>	Most consumed services are self-produced, while relevant services are available for reuse		A selection of consumed services are reused		(Nearly) all consumed services are reused
<b>C.4 (30%)</b>	No, updates require manual intervention from public service staff or end user(s)		Partly, some updates require manual intervention from public service staff or end user(s), while others are received automatically		Fully, all relevant updates are received automatically  Not applicable

Table 3: Scoring Table 'Service Consumption'

### 3.2 Recommendations

Question	Assessed level	Next level	Recommendation
<b>C.2 Manual or digital consumption of services</b>	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.
<b>C.3 Reusing or producing services</b>	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.
<b>C.4 Subscriptions to updates</b>	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.

**Table 4** Recommendations ‘Service Consumption’

## 4 Service Management (D)

### 4.1 Scoring Table

	Ad hoc (1)	Opportunistic (2)	Essential (3)	Sustainable (4)	Seamless (5)
<b>D.1 (25%)</b>	None	One answer ticked	Two answers ticked	Three answers ticked	Four answers ticked
<b>D.2 (10%)</b>	No standards in procurement		Partially standards-based procurement		Fully standards-based procurement
<b>D.3 (10%)</b>	Manual choreography		Semi-automated choreography		Fully automated choreography
<b>D.4 (10%)</b>	No BPM		Ad hoc BPM	Standards-based BPM	Standards-based and collaborative BPM
<b>D.5 (10%)</b>	No architectural framework				Architectural framework
<b>D.6 (15%)</b>	Closed specification process		Stakeholders have been invited once	Stakeholders are invited periodically (frequently)	Open specification process
<b>D.7 (10%)</b>	Proprietary definitions				Common (open) concepts and definitions
<b>D.8 (10%)</b>	No SLAs		SLAs without monitoring		Monitored SLAs and corrective action

Table 5: Scoring Table 'Service Management'

## 4.2 Recommendations

Question	Assessed level	Next level	Recommendation
<b>D.1 Reuse and sharing</b>	Sliding scale (when not already seamless) – 5 levels		<p>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:</p> <ol style="list-style-type: none"> <li>1. Provisioning of open Web-API services</li> <li>2. Sharing source code and/or downloadable software components (including required licensing)</li> <li>3. Sharing documentation</li> <li>4. Provisioning of knowledge (direct Q&amp;A support)</li> </ol>
<b>D.2 Procurement criteria</b>	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 (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.
<b>D.3 Service choreography</b>	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.

<b>D.4 Business process model</b>	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 partners (of the consumed and / or shared services) can benefit you substantially in working towards a future proof interoperable process flow in your domain.
<b>D.5 Architectural Framework</b>	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><i>References:</i></p> <p>European Interoperability Reference Architecture:  <a href="https://joinup.ec.europa.eu/asset/eia/home">https://joinup.ec.europa.eu/asset/eia/home</a></p> <p>TOGAF  <a href="http://pubs.opengroup.org/architecture/togaf9-doc/arch/">http://pubs.opengroup.org/architecture/togaf9-doc/arch/</a></p> <p>NORA:  <a href="http://www.noraonline.nl/wiki/Hoofdpagina">http://www.noraonline.nl/wiki/Hoofdpagina</a></p>
<b>D.6 Specification process</b>	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 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.
<b>D.7 Concept definitions</b>	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 organizations. Consider leveraging common/standardised concept definitions and controlled vocabularies (e.g. code lists, thesauri).
<b>D.8 Service Level Agreements (SLAs)</b>	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.

**Table 6** Recommendations ‘Service Management’