

ISA Workshop

Interoperability Maturity Model (IMM)

Project Officers:
Vassilios Peristeras
Athanasios Karalopoulos

23 September 2014



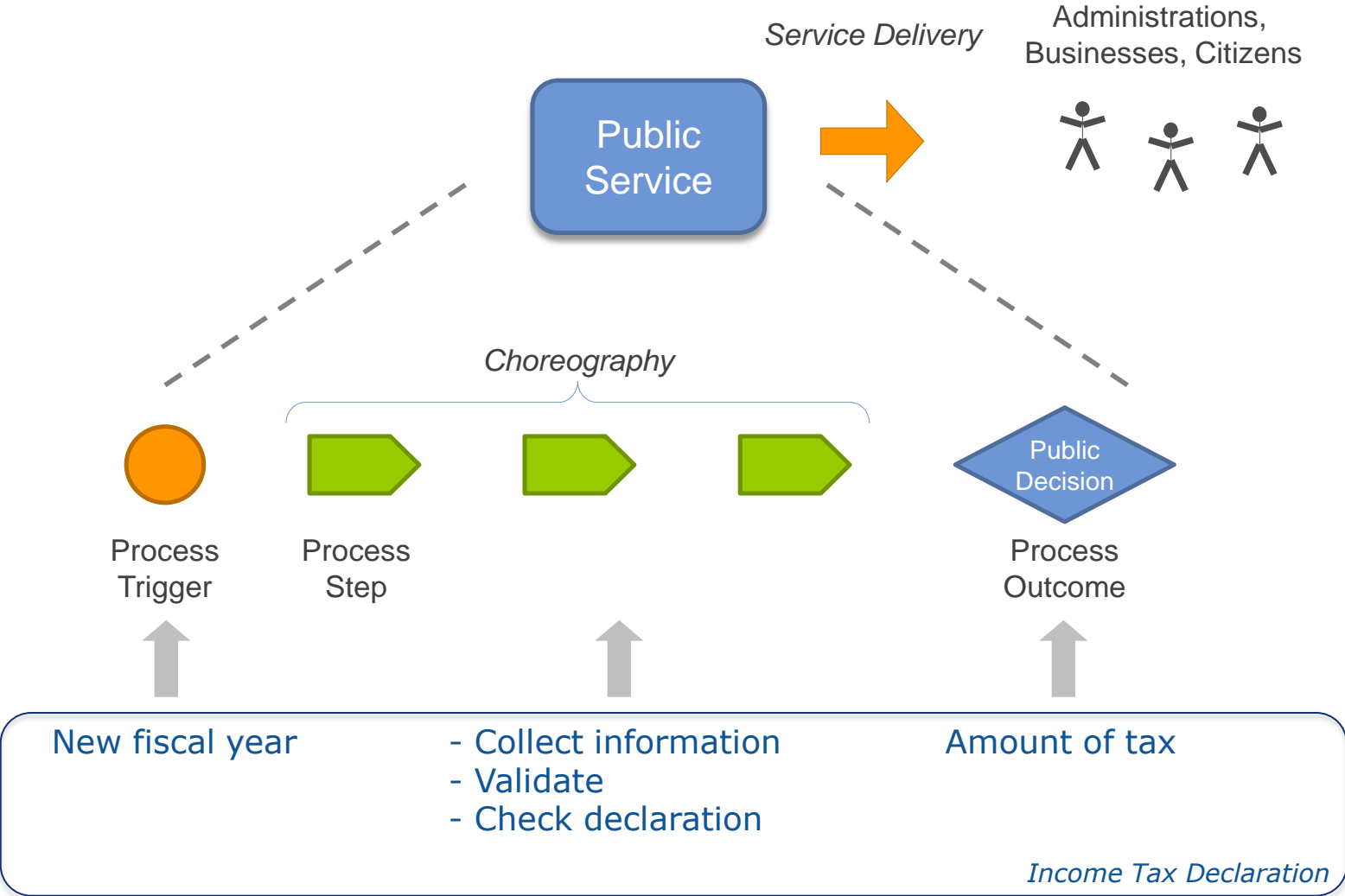
If you cannot measure it, you cannot improve it ...

Interoperability (IOP) is an abstract concept

How to define and measure it ?

What could be the subject of an
"interoperability assessment" ?

The subject of the assessment



Where IOP is measured

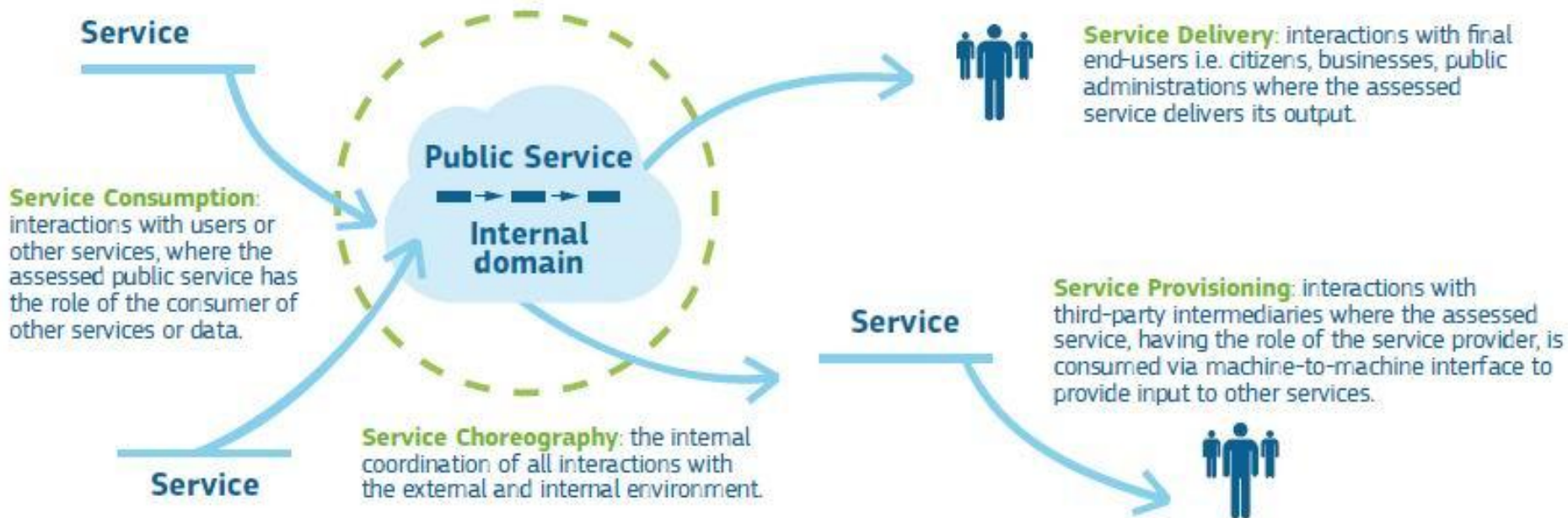


Service Delivery

Service Consumption

Service Provisioning

Service Choreography



IOP is measured in four IOP areas

I decided to design a new public service as interoperable as possible...

- What does "interoperable service" really mean?
- From where should I start?
- Which parts of the service design are related to interoperability?



Use IMM as a **design tool** to:

- ✓ Identify very fast the prerequisites for IOP
- ✓ Achieve "IOP by default" or "IOP by design"

I plan to modify an existing service...

- Where do I stand?
- How can I improve the IOP maturity of the service?
- How the planned changes affect the existing IOP?



Use IMM as an **assessment tool** to:

- ✓ Identify where and why the service doesn't score well
- ✓ Get recommendations on how to improve IOP
- ✓ Compare historically how IOP of the service progress, e.g. in the case of a system update

Maturity level	Maturity stage	Interpretation
1	Ad Hoc	Poor interoperability — almost no interoperability in place
2	Opportunistic	Fair interoperability — some elements of interoperability best practices appear
3	Essential	Essential interoperability — the essential best practices for interoperability appear
4	Sustainable	Good interoperability — major, relevant IOP best practices are implemented
5	Seamless	Interoperability leading practice — the service is a leading example

← Desired level



- ✓ You get an assessment of the IOP of your service
- ✓ You get recommendations on how to improve the IOP of the service
- ✓ You can compare historically how IOP of your service progress, e.g. in the case of a system update
- ✓ It is a self-assessment model
- ✓ On average, you need between 4-8 hours to complete it



Where IOP is measured

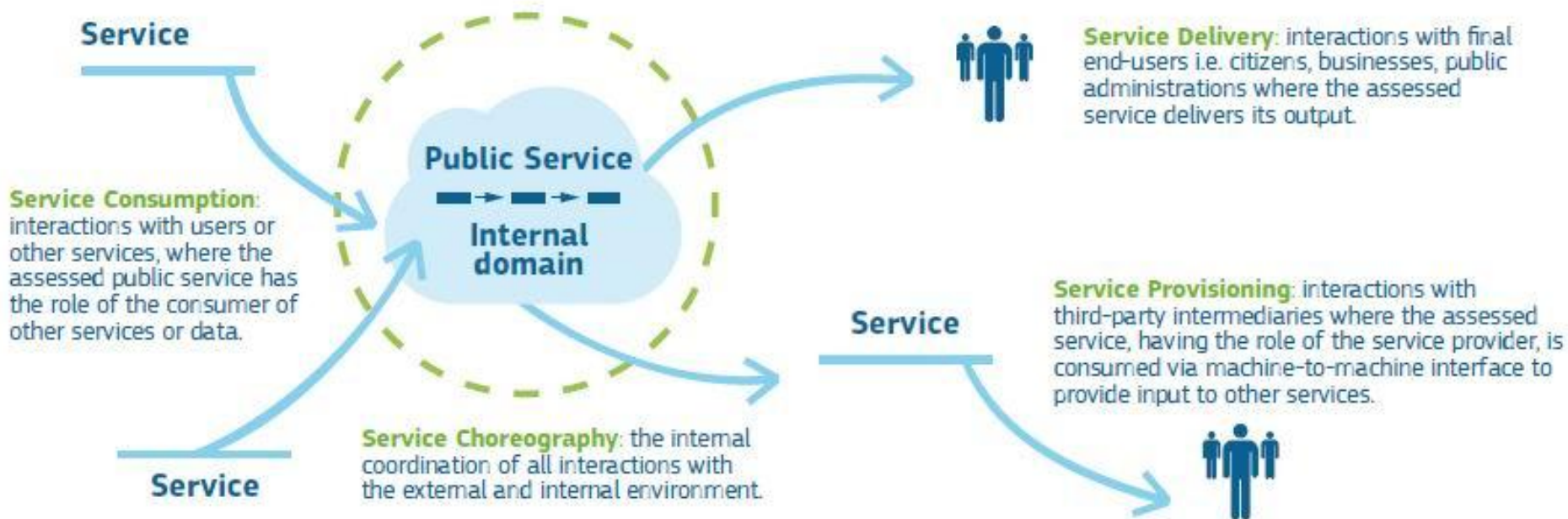


Service Delivery

Service Consumption

Service Provisioning

Service Choreography



IOP is measured in four IOP areas



Public Service	Service Delivery	Service Provisioning	Service Consumption
Electronic Health Record Access	<p>Citizens are offered the service to access their Electronic Health Record via the eHealth portal.</p> <p>Case example: <i>The service called “My Health summary” is available through the Danish eHealth portal 'Sundhed.dk' for citizens and allows authenticated users to obtain an overview of their own patient data.</i></p>	<p>Not applicable</p>	<p>Payment services</p> <p>Identity and access management services</p> <p>eSignature services</p> <p>Personal medicine data</p> <p>Donor registration</p> <p>Living will registration</p> <p>Laboratory data</p>
Online Patent Filing	<p>Businesses are offered the service to register and pay for the filing of patents.</p> <p>Case example: <i>The EPO Online Filing client application provides applicants with a standard form for filing patent applications online with the European Patent Office. Once the request is filed, the applicant receives an electronic notification of receipt. If the applicant has set up an online Mailbox , he will receive all further communication from the EPO via this Mailbox, including requests for rectifying the application and the invitation to pay claims fees.</i></p>	<p>Search classification service</p>	<p>Payment services</p> <p>identity and access management services</p> <p>eSignature services</p>
Government E-invoicing	<p>Business are offered the service to send online invoices towards the various government administrations.</p> <p>Case example: <i>Businesses can send all their invoices in electronic format to the Dutch government. In total, more than 78 government bodies have implemented electronic invoicing. The sending and receipt of e-Invoices can take place through two channels: Digipoort (direct access or via an intermediary) or the e-Invoicing portal www.facturereenaandeoverheid.nl.</i></p>	<p>Open Data provisioning</p> <p>Purchasing catalogue service</p> <p>Contract register</p> <p>Purchase order sender</p> <p>Invoice receiver</p>	<p>Payment services</p> <p>Identity and access management services</p> <p>eSignature services</p>

Service Delivery

Service Consumption

Service Provisioning

Service Choreography

A public service is more interoperable as the number of the alternative channels and devices used for accessing it increases





B.3

<i>Name</i>	Form pre-filling
<i>Category</i>	Manifestation
<i>EIF-layer</i>	Semantic interoperability; Technical interoperability
<i>Weight</i>	40%
<i>Question type</i>	Elementary attribute
<i>Rationale</i>	Re-use of existing trustworthy data sources in pre-filled forms should be stimulated as it minimizes end user effort and reduces the risk for erroneous data entries
<i>Question</i>	<p>Does the public service use pre-filling of forms?</p> <ul style="list-style-type: none">■ No■ Yes, pre-filling is used but only for some data fields that are electronically available■ Yes, pre-filling is used for all data fields that are electronically available■ Not applicable, the public service does not require user data
<i>Examples</i>	Existing base registries (or other data sources) are used for the pre-filling of forms so name, address data is accurate. When a certain form or web page uses auto-filling (automatic completion of key words) or drop-down boxes with multiple answer options this is not considered pre-filling.
<i>Question logic</i>	Next question



B.4

<i>Name</i>	Multilingualism
<i>Category</i>	Manifestation
<i>EIF-layer</i>	Organisational interoperability; Semantic interoperability; Technical interoperability
<i>Weight</i>	15%
<i>Question type</i>	Elementary attribute
<i>Rationale</i>	Multilingualism in the context of computing indicates that an application dynamically supports two or more languages.
<i>Question</i>	<p>To what extent is multilingualism supported?</p> <ul style="list-style-type: none">■ Not at all■ Partly, only the user interface is multilingual (two or more official EU languages supported)■ Fully, the entire service (user interface, support documentation, technical specifications, etc.) as such is multilingual (two or more official EU languages supported)
<i>Examples</i>	Multilingual support is provided for the user interface only; the entire service (user interface, functional & technical documentation, online- and offline support documentation, etc.) is made available to end users in three languages.
<i>Question logic</i>	Next question

Question	Ad hoc	Opportunistic	Essential	Sustainable	Seamless
B.2	B.1 Service is not offered via online self service channel	Single	Multiple		All common
B.3		No pre-filling	Partial pre-felling	Full pre-filling	
B.4		No multilingual support	Partly multilingual		Fully multilingual
B.5			No URL-linking	Yes, URL linking (one-way)	Yes, URL linking (both ways)

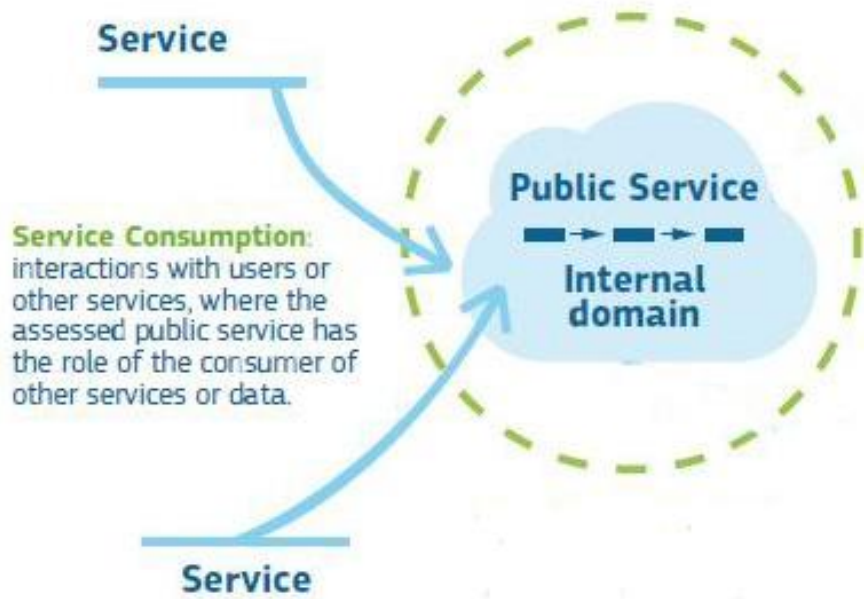
Service Delivery

Service Consumption

Service Provisioning

Service Choreography

A public service is more interoperable as the number of the electronically consumed services increases



Service Consumption: Example question



C.5

<i>Name</i>	Push-pull mechanisms
<i>Category</i>	Manifestation
<i>EIF-layer</i>	Technical interoperability
<i>Weight</i>	10%
<i>Question type</i>	Repeated attribute
<i>Rationale</i>	The interaction mode depends on the specific context of the public service. Automatic triggering made possible via a push mechanism or a situation where both mechanisms are in place is considered more mature
<i>Question</i>	<p>What is the interaction mode with the service?</p> <ul style="list-style-type: none">■ <i>Pull only, whilst push could be added</i> – the public service initiates and processes the outcome of the consumed service. There are no legal or other constraints hindering that the push mechanism is added■ <i>Pull only due to legal or other constraints</i> – the public service initiates and processes the outcome of the consumed service. There are legal or other constraints hindering that the push mechanism is added■ <i>Push only, whilst pull could be added</i> – the public service receives automatically updates from the consumed service based on (change) events and processes these updates. There are no legal or any other constraints hindering that the pull mechanism is added■ <i>Push only due to legal or other constraints</i> – the public service receives automatically updates from the consumed service based on (change) events and processes these updates. There are legal or other constraints hindering that the pull mechanism is added■ Both mechanisms are used
<i>Examples</i>	The public service receives automatic updates from the base registry for income details (push interaction mode). Information is queried when required for pre-filling forms (pull interaction mode).
<i>Question logic</i>	For each listed consumed service. Next question.

Service Consumption: Scoring example



Question	Ad hoc	Opportunistic	Essential	Sustainable	Seamless
C.1-C.2 -C.3¹	Internal consumption while the service could be consumed from another administration electronically Internal manual consumption	Manual external consumption	External electronic consumption: Scoring outcome dependent on C.3-C.15		
C.4				Batch / Real-time	Both modes are supported or single processing mode due to legal or other constraints
C.5			Push	Pull	Both push and pull or single mechanism due to legal or other constraints
C.6			Ad hoc protocol specification		Common protocol specification

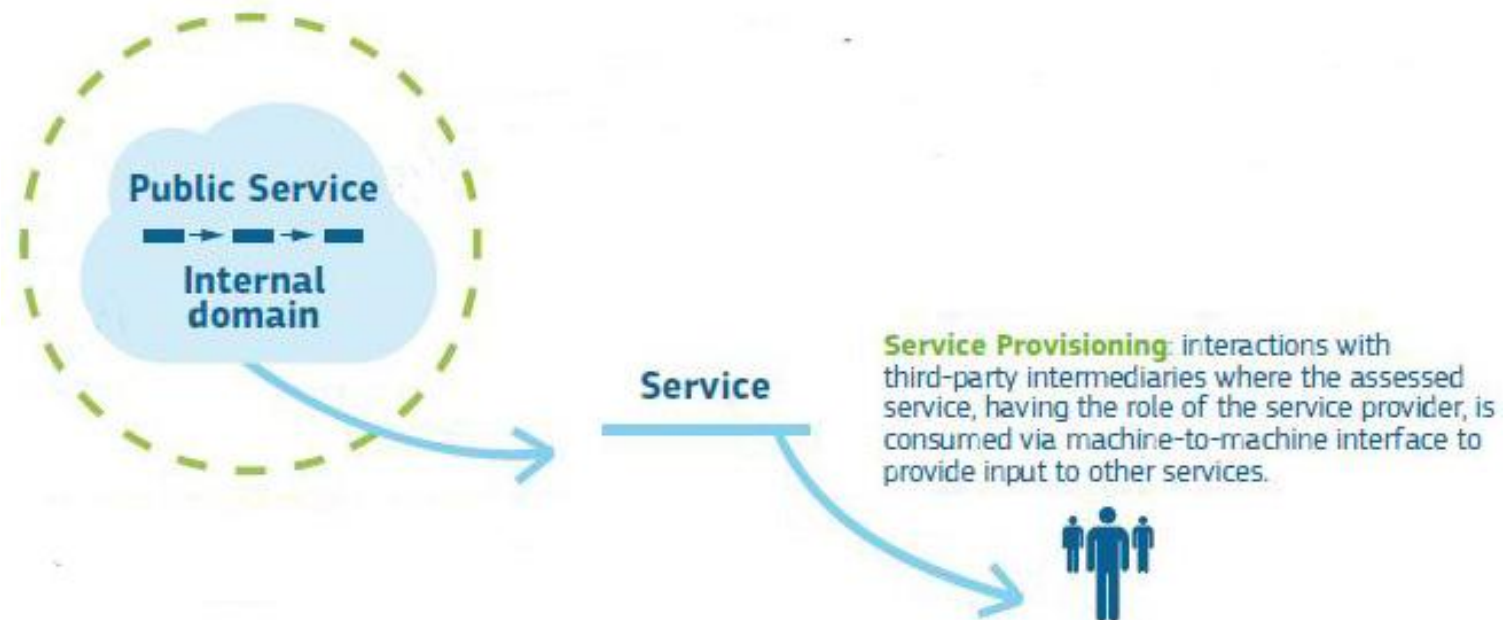
Service Delivery

Service Consumption

Service Provisioning

Service Choreography

A public service is more interoperable as the number of the provided machine-to-machine services increases





D.8

<i>Name</i>	Semantic alignment
<i>Category</i>	Manifestation
<i>EIF-layer</i>	Semantic interoperability
<i>Weight</i>	15%
<i>Question type</i>	Repeated attribute
<i>Rationale</i>	Reuse of common semantic standards is considered more interoperable than developing dedicated standards
<i>Question</i>	What type of semantic standard is used for the exchange of information? <ul style="list-style-type: none">■ Ad hoc solution■ Common semantic standard■ Common semantic standard and support of additional other data formats to enhance service reach and/or facilitate service migration
<i>Examples</i>	Existing common XML-based standards are used widely in the service domain and are also used for provisioning the service; a unique semantic standard is developed specifically for this interconnection. Multiple versions (e.g. the current version and the replaced version – ‘n-1’) are supported by the public service to ensure consuming organizations can migrate at a moment that is suitable for them (thereby offering a phased migration strategy).
<i>Question logic</i>	For each listed provisioned service. Next question.



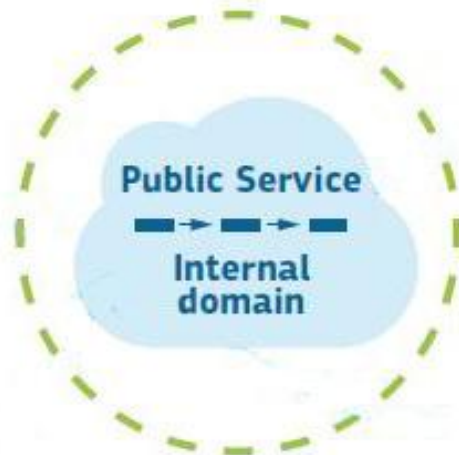
Service Delivery

Service Consumption

Service Provisioning

Service Choreography

A public service is more interoperable when there is an automated single point of control that facilitates the service execution



Service Choreography: the internal coordination of all interactions with the external and internal environment.



E.2

<i>Name</i>	Level of automation of the choreography
<i>Category</i>	Manifestation
<i>EIF-layer</i>	Technical interoperability
<i>Weight</i>	15%
<i>Question type</i>	Elementary attribute
<i>Rationale</i>	Automation of the choreography facilitates a rapid and seamless interaction between the public service and the consumed and provisioned services.
<i>Question</i>	<p>To what extent is the service choreography automated?</p> <ul style="list-style-type: none">■ Fully manual (<i>all transactions are handled manually</i>)■ Semi-automated (<i>a part of the service choreography relies on manual interference</i>)■ Fully automated (<i>no manual interference is required</i>)
<i>Examples</i>	Service choreography is manual or semi-automated when the required orchestration requires (some part) manual interaction. A public service is considered fully automated when all required service transactions are tracked automatically and no manual interference is required. Note that this question does not address the topic of exception handling. The service choreography can be fully automated (applying to all transactions) but still manual intervention can be required for certain exceptions or errors (this is discussed under the topic exception handling).
<i>Question logic</i>	Next question



Overview

Contains the principles of the IMM

Guidelines

Provides a deeper insight into how IMM works and discusses the definitions, maturity categories, interoperability areas and scoring principles that are used in the model. To be read before applying IMM.

Questionnaire

Details all the questions and underlying metadata fields (Name, Category, EIF-layer, Weight, Type, Rationale, Examples and Logic)

Recommendations

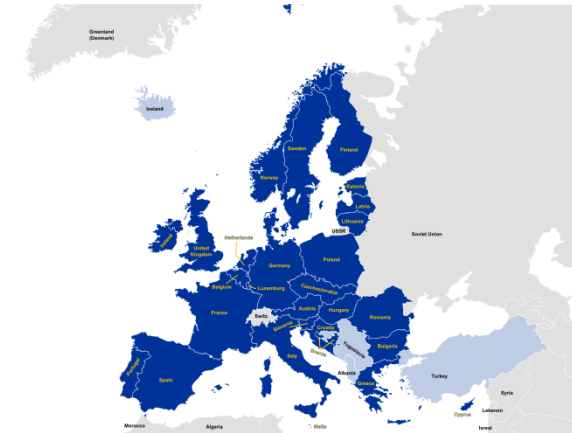
Details the improvement steps and recommendations that can be provided to the public service based on the questionnaire outcomes



Pilot assessments in 2012



Assessment of **16 services** provided by large Trans European Systems (2014)



TES System	Domain	TES System	Domain
e-PRIOR	Public procurement	ESBR	Business registers
DUES	Trade	MT@EC	Machine translation
e-Justice portal	Justice	TACHONET	Tacho information
IMI	International market	SARI	State aid
ECRIS	Emergency	ECN	Competition
MH	Criminal records	INSPIRE geo-portal	Geodata
SINAPSE	Statistical metadata	e-Trustex	Document exchange



Information and document exchange

Discuss your experiences



Provide recommendations and suggestions



Follow-up report



Explain in detail the model



Personalized support in completing the questionnaire





- ✓ Further refinement based on the feedback received from the assessed services and from ongoing assessments of national and local public services
- ✓ Extend the scope to assess organizational interoperability aspects
- ✓ Integrate results produced by other ISA actions
- ✓ Exploratory work to identify commonalities and possible alignment with third-party models (for example with the USA Interoperability Maturity Model)



Questions?

Athanasios.Karalopoulos@ec.europa.eu
Vassilios.Peristeras@ec.europa.eu