Selected architectural European interoperable solution templates in IOP Cartography tool

European Interoperability Architecture (EIA) action of ISA

EIA-D02.05-v2.00_Selected architectural European interoperable solution templates in IOP Cartography tool

Specific Contract N. 83

Framework contract N. DI/06691

5 June 2014

Document control information

Document Title	*EIA-D02.05_Selected architectural European interoperable solution templates in IOP Cartography tool*
Project Title	*European Interoperability Architecture*
Document Author	*Deloitte Consulting CVBA*
Project Owner	*Margarida Abecasis*
Project Manager	*Raul-Mario Abril-Jimenez*
Document Version	*v2.00*
Sensitivity	*Limited*
Date	*5 June 2014*
Document Location	*https://webgate.ec.europa.eu/CITnet/confluence/display/EIA/D02.05+-+Pilot+solution+template*

Document control information

Document Approver(s) and Reviewer(s)

Name	Role	Action	Date
Raul-Mario Abril-Jimenez	*Project Officer*		

Document History

Revision	Date	Created by	Short description of the change
v0.1	*12/05/2014*	*Deloitte Consulting CVBA*	*Draft version for review*
v0.2	*24/05/2014*	*Deloitte Consulting CVBA*	*For acceptance*
v0.3	*26/05/2014*	*Deloitte Consulting CVBA*	*Implementation of Project Officer's comments*
v0.4	*27/05/2014*	*Deloitte Consulting CVBA*	*Implementation of Project Officer's comments*
v1.0	*28/05/2014*	*Deloitte Consulting CVBA*	*Aligned with the new version of the EIRA*
v2.00	*5/06/2014*	*Deloitte Consulting CVBA*	*Implementation of HoU's comments, and additional minor updates*

Disclaimer

The information and views set out in this presentation are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this presentation. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

Table of contents

Introduction	**5**
Approach to create and use an architectural solution template	**8**
Architectural Solution templates • Administrative cooperation through Information Exchange • Trans-European billing system • Trans-European User Authentication system	**11**
Implementation in the Cartography tool	**47**
Annex	**49**

Introduction

Introduction

Definition

An architectural solution template is a sub-set of the building blocks of the EIRA, which focuses on the most salient building blocks needed to build an interoperable solution addressing a particular interoperability need.

Benefits

- An architectural solution template provides solution architects with a common and unambiguous approach to cope with a specific interoperability challenge.
- A solution architect can easily create a solution architecture by mapping existing solution building blocks (developed in his/her organisation or discovered through the TES Cartography) to an architectural solution template.
- When a user creates an architectural solution template, he/she can recommend specific solution building blocks (e.g. a particular application or data model) for its implementation. This allows a faster implementation of the architectural solution template when it is shared with other parties.
- An architectural solution template can be created within and across the different views of the EIRA. A solution template can then support architects specialised in different architecture domains (organisational/business architecture, application architecture, data/semantic architecture, technology architecture)

Introduction

Example of architectural solution template application

A new policy is developed at EU level, which requires public administrations to implement a new interoperable IT system in the near future. The implementation of the policy can imply significant changes in the IT landscape of the impacted public administrations.

An architectural solution template, focused on the building blocks needed to implement that specific policy, can provide the involved parties with a common approach to be compliant with the new legal requirement, thus reducing the architecture design effort and maximising the share and re-use of solutions among the involved public administrations.

Approach to create and use an architectural solution template

Approach

Creation of an architectural solution template

This flow specifies the step-by-step design process of a new architectural solution template.

Step 1: Identify needed EIRA BBs	The user consults the views of the EIRA to define the scope of the architecture to be designed, by identifying the architectural building blocks that are needed to address the interoperability need.
Step 2: Create blueprint of solution template	Based on the identified architectural building blocks, the user can design an architectural solution template (e.g. in archimate format). The solution template includes the needed sub-set of architectural building blocks of the EIRA.
Step 3 (optional): Add Interoperability requirements and solution BBs	If needed, per each building block, the user adds a set of additional interoperability requirements that are needed to address the specific interoperability need (e.g. specific protocols to be used by an application). Solution building blocks might be recommended for the implementation of the architecture building bocks of the solution template.
Step 4: Share solution template	The architectural solution template is shared with the involved stakeholders (e.g. by sharing or uploading the archimate diagram of the solution template).

European Commission

Usage of an architectural solution template

This flow specifies the step-by-step process for using an existing architectural solution template.

Step 1: Consultation of the solution template

The user consults the architectural solution template, via the Cartography tool, related to the particular interoperability need he/she wants to address.

Step 2: Mapping with existing solutions

The user maps the solution building blocks of its current IT landscape to the template. For each building block (BB) in the solution template:

- If an existing solution of the user's IT landscape is compliant with the interoperability requirements of the BB, the user maps the solution with the BB.
- If no existing solutions are compliant with the interoperability requirements of the BB, the user searches in the Cartography for a re-usable solution. If a solution is found, the user maps the discovered solution to the BB.
- If no compliant solutions are found on the Cartography, the user initiates a project to develop a new solution BB compliant with the interoperability requirements. The user maps the solution to be developed to the BB.

Step 3: Design solution

The user includes the solution building blocks identified in the previous step (i.e. step 2) in the system's solution architecture, in order to address initial interoperability need.

Architectural Solution templates

- Administrative Cooperation through Information Exchange
- Interoperable European billing system
- Interoperable European User Authentication system

The three architectural solution templates described in this section have been developed during the current phase of the EIA action. The three architectural solution templates must be considered as a first version, and will be improved in the future.

Architectural Solution template 1:
Administrative Cooperation through Information Exchange

Administrative Cooperation through Information Exchange

Goal

This architectural solution template addresses the need of administrative cooperation between two or more European public administrations. The architectural solution template focuses on supporting interoperable information exchange, by highlighting the most relevant building blocks of the EIRA needed to fulfil this need.

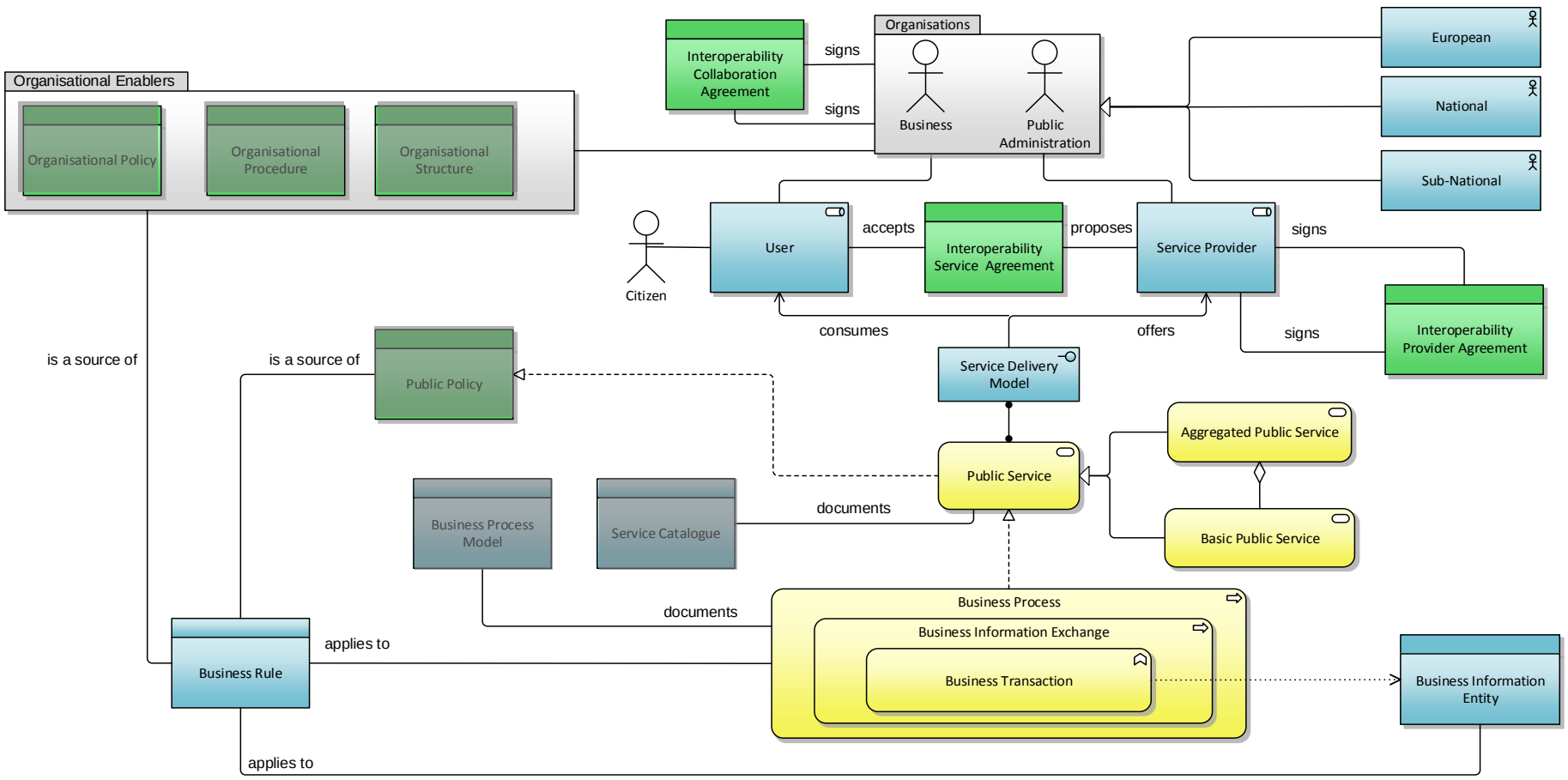
Comments

The information exchange mechanism is focused:

- At organisational level, on providers and users of information, on the agreements between parties, and on the supporting business processes;
- At semantic level, on the structure of the data which need to be exchanged;
- At technical level, on the applications needed to transform, translate and exchange data, on the interfaces needed to exchange data, and on the supporting infrastructure and security services.

Organisational view

Organisational View



Narrative of the Organisational view

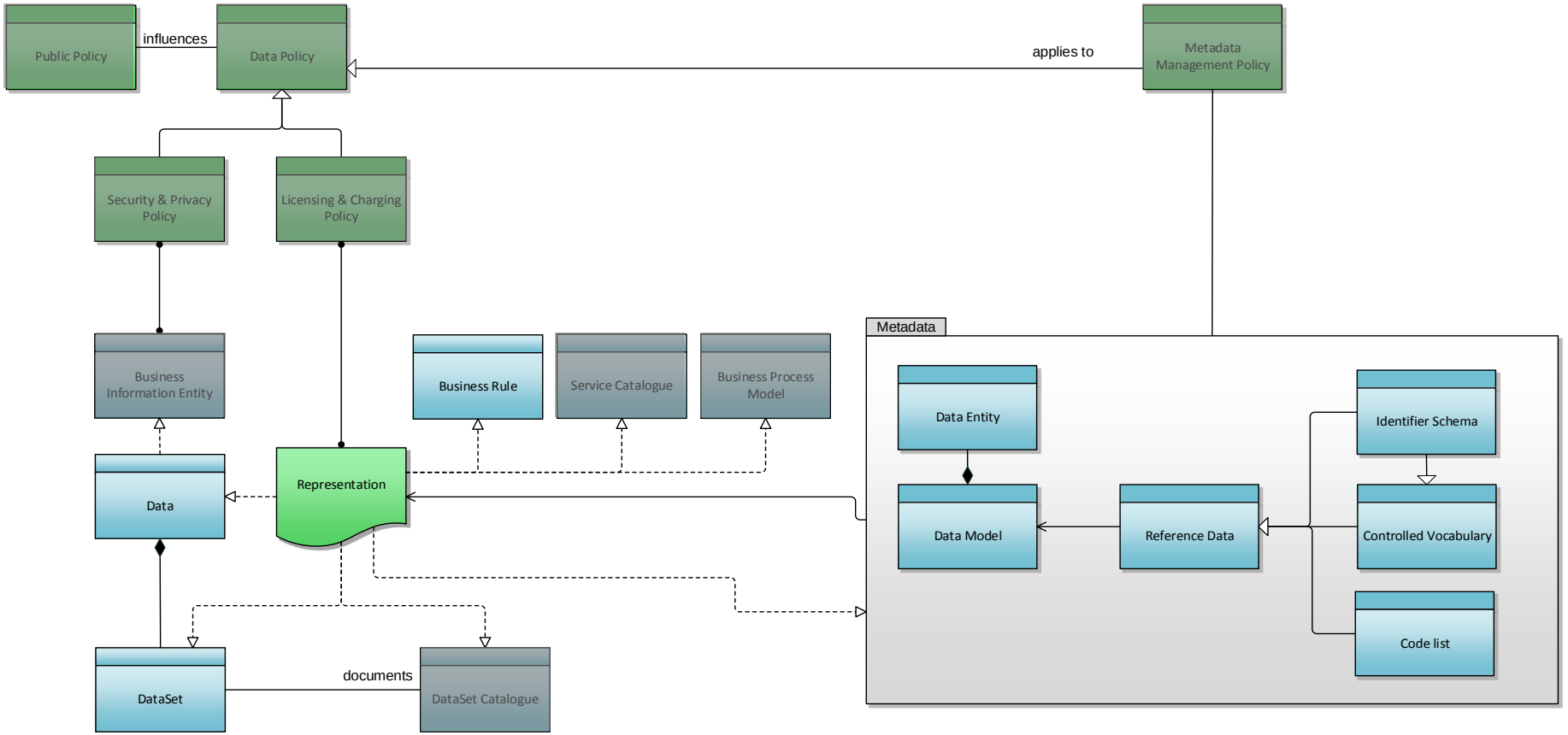
Administrative cooperation, cross-sector and cross-border, is realised by [Organisations] on [EU / national / sub-national level] in the role of Service Providers by supplying information exchange interoperable [Public Services] to [Public Administrations] and/or [Businesses] and/or [Citizens] in the role of users according to a [Service Delivery Model]. Organisations collaborating on the development of the information exchange public service, can sign an [Interoperability Collaboration Agreement]. With the aim of delivering the information exchange public service, the service provider proposes and the user accepts an [interoperability service agreement]. [Service providers] can sign an [Interoperability supplier agreement] to agree on how to deliver the public service to their users.

The delivery of these services is realised through [Business Processes] that contain [Business Information exchange], which enclose [Business Transactions] of defined [Business Information Entities] (i.e. the subject of the information exchange). Business processes and business information entities are subject to [Business Rules].

Semantic view

European Commission

Semantic View



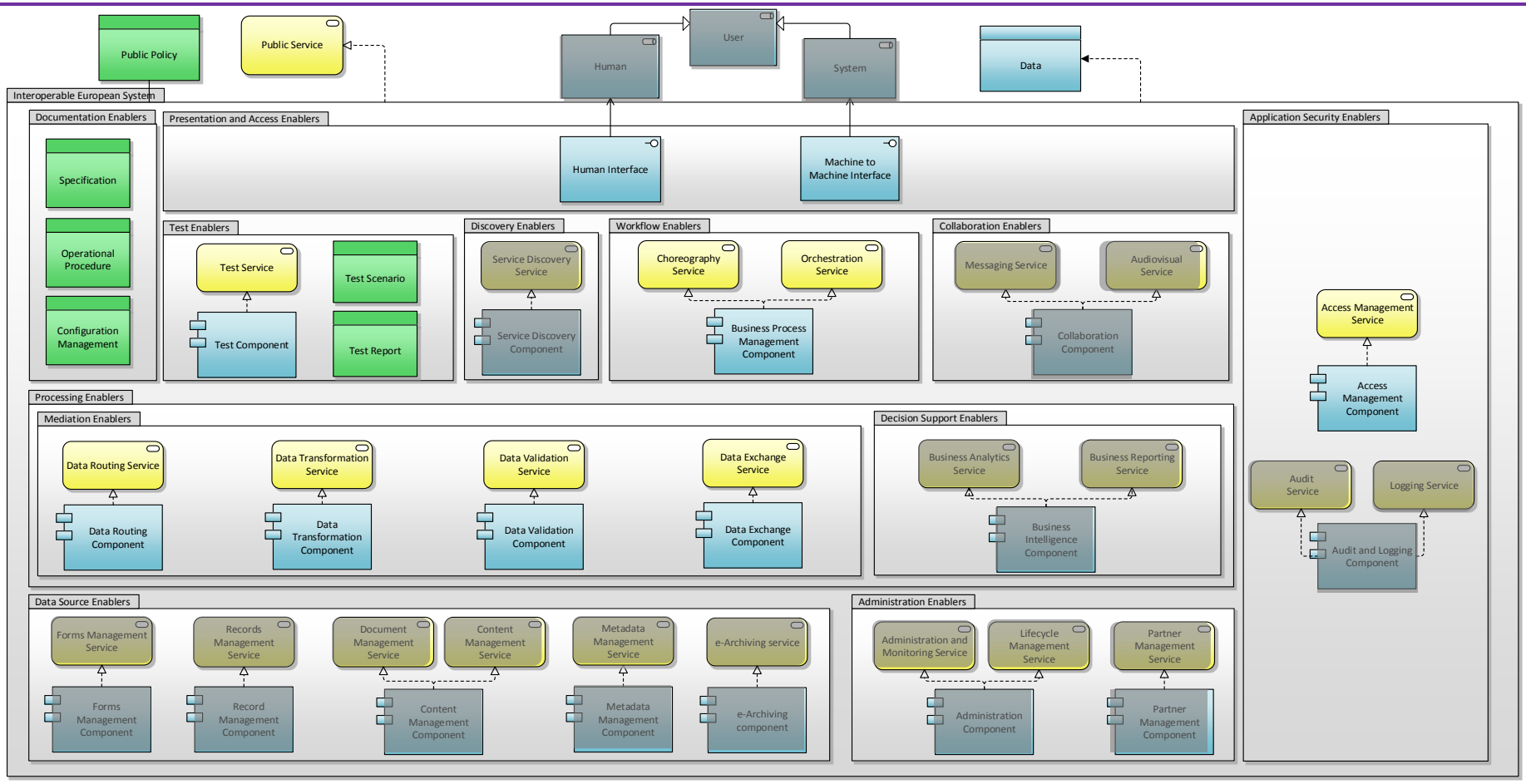
Narrative of the Semantic view

[Data] to be exchanged, which is grouped in [data sets], is represented using a specific [representation] format. [Business rules], applying to data, are also subject to a representation. [Metadata], composed of [Data models] and [Reference data], provide the structure for the exchanged data [representation]. The reference data include [Identifier Schemas] (e.g. structure of the ID of the parties involved in information exchange), [Controlled Vocabularies], and/or [Code lists] (e.g. code lists of EU countries).

Technical view – Application

European Commission

Technical View - Application



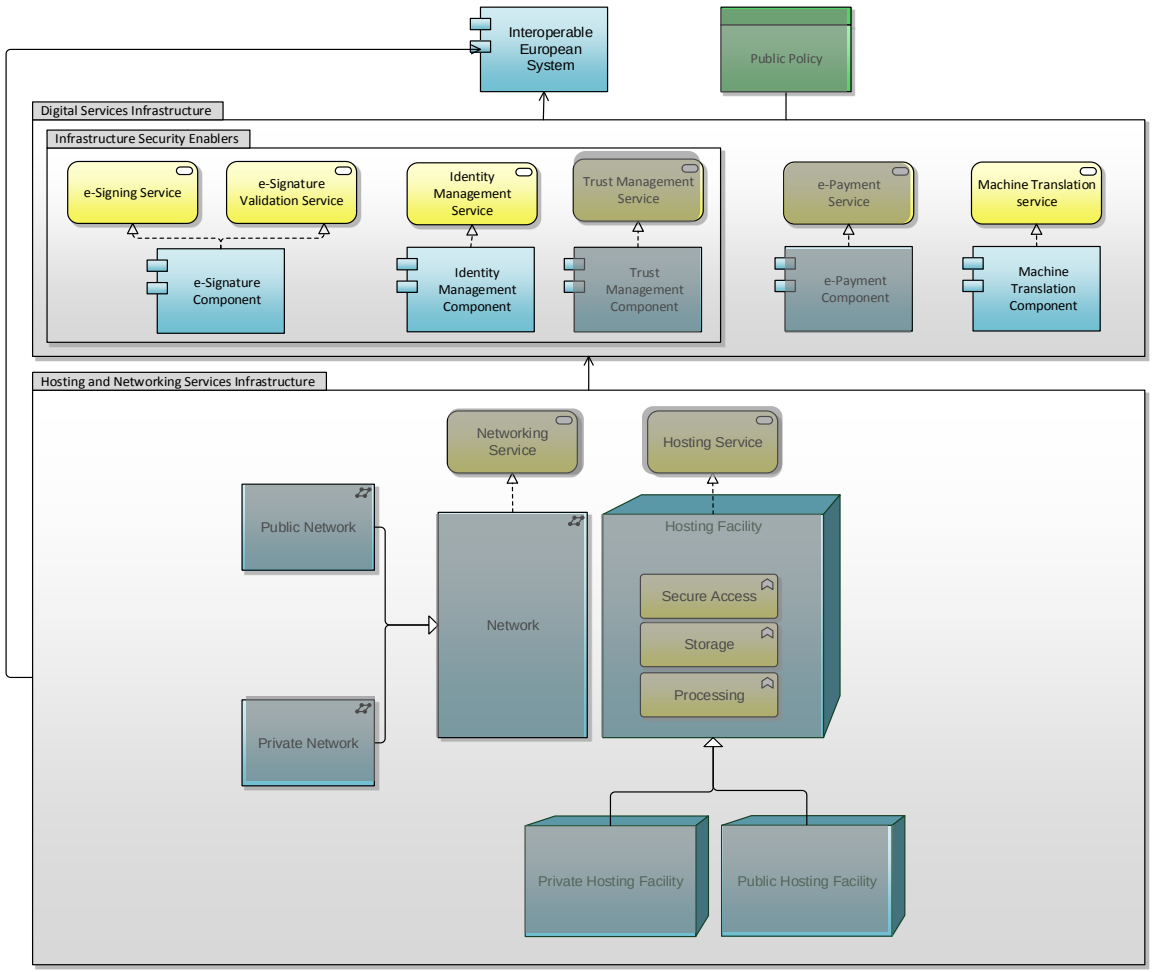
Narrative of the Technical view – Application

An information exchange [Interoperable European System (IES)] implements the information exchange [Public Services]. The IES can be accessed through [Presentation and Access enablers]. The IES is documented through [documentation enablers] and is tested through the use of [test enablers]. Information can be exchanged cross-sector and cross-borders with the support of [mediation enablers]. The system can execute the information exchange business processes through [workflow enablers].
Access control is managed through the services offered by [access management components].

Technical view – Infrastructure

European Commission

Technical View - Infrastructure



Narrative of the Technical view – Infrastructure

An information exchange [Interoperable European System (IES)] can make use of [infrastructure security enablers] to manage the security of the exchanged information (e.g. e-Signature on documents or authentication of the systems/users accessing information) and of [machine translation services] to translate information in an automated way when it is exchanged cross-border.

Architectural Solution template 2: Interoperable European billing system

Interoperable European billing system

European Commission

Goal

This architectural solution template addresses the interoperability challenges that need to be overcome when implement a billing process (e.g. e-Invocing) at European level. This architectural solution template highlights the most salient building blocks needed to align the existing solutions or to develop new solutions that enable the implementation of an interoperable cross-border billing process.

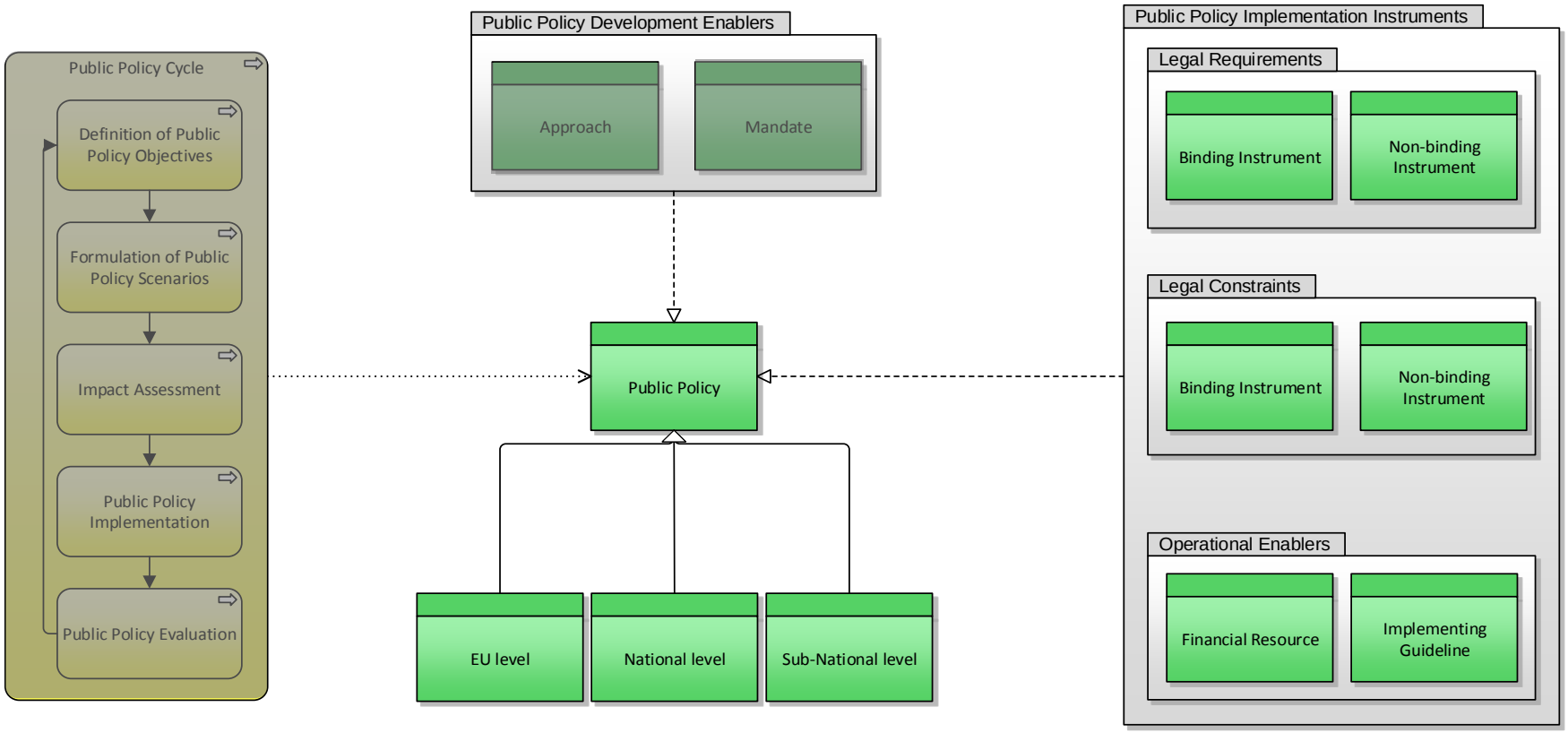
Comments

This solution template takes into account:

- At legal level, the relevant EU and national policies/legislation impacting the trans-European billing process
- At organisational level, the billing business processes that are driving the solutions, the parties involved in the billing system and the relevant interoperability agreements
- At semantic level, the structure of the data which needs to be sent (e.g. electronic invoices and electronic receipts
- At technical level, the applications that are needed to exchange and validate information

European Commission

Legal View



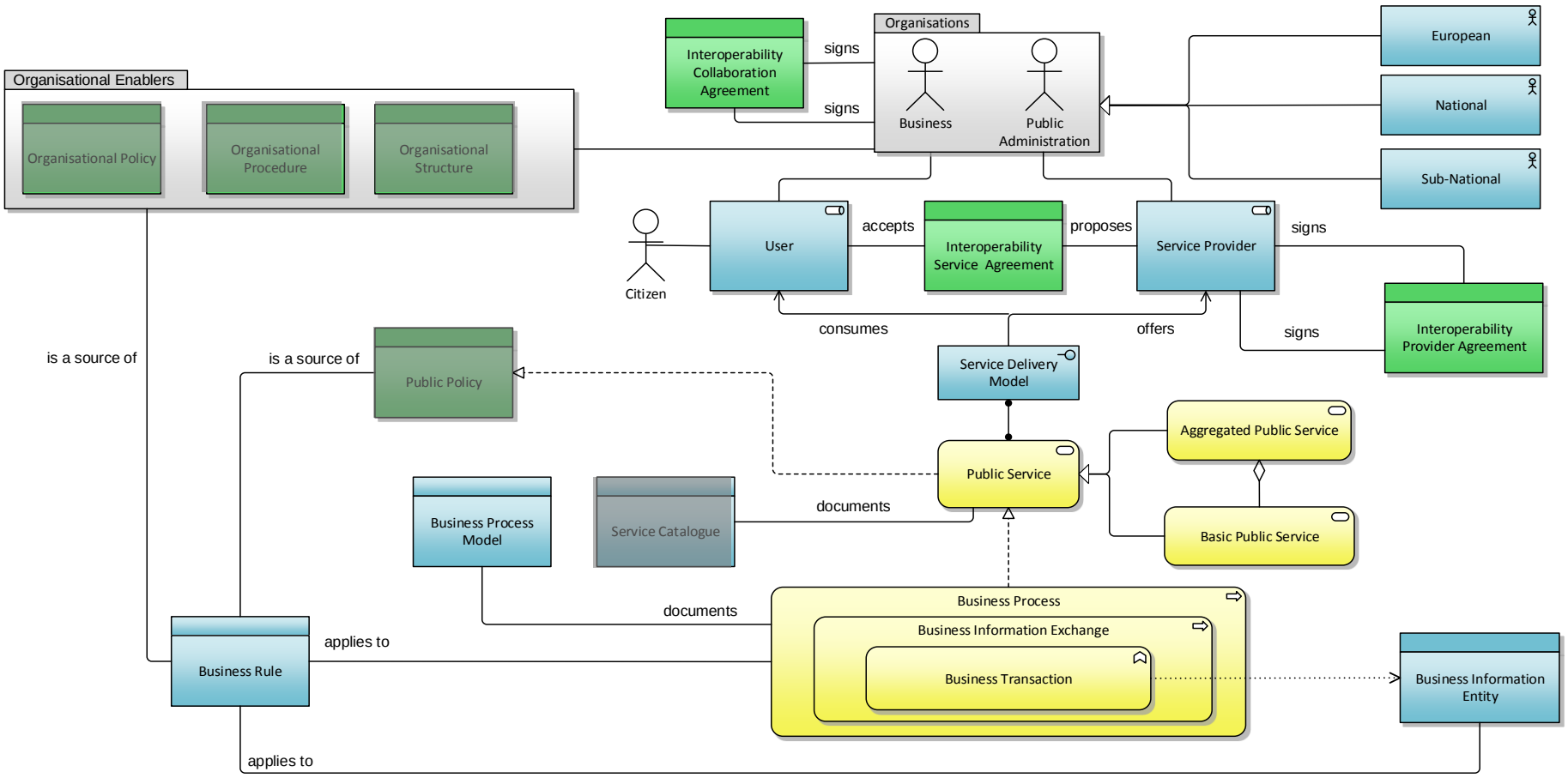
Narrative of the Legal view

A [public policy] in the field of e-Procurement or Internal Market, at [EU level, National level or Sub-national level] can have an impact on or mandate the implementation of an Interoperable European billing system. The policy is implemented through policy instruments, which can be [binding / non-binding] [legal requirements or constraints], or operational enablers, in the form of [financial resources] and [implementing guidelines].

Organisational view

European Commission

Organisational View



Narrative of the Organisational view

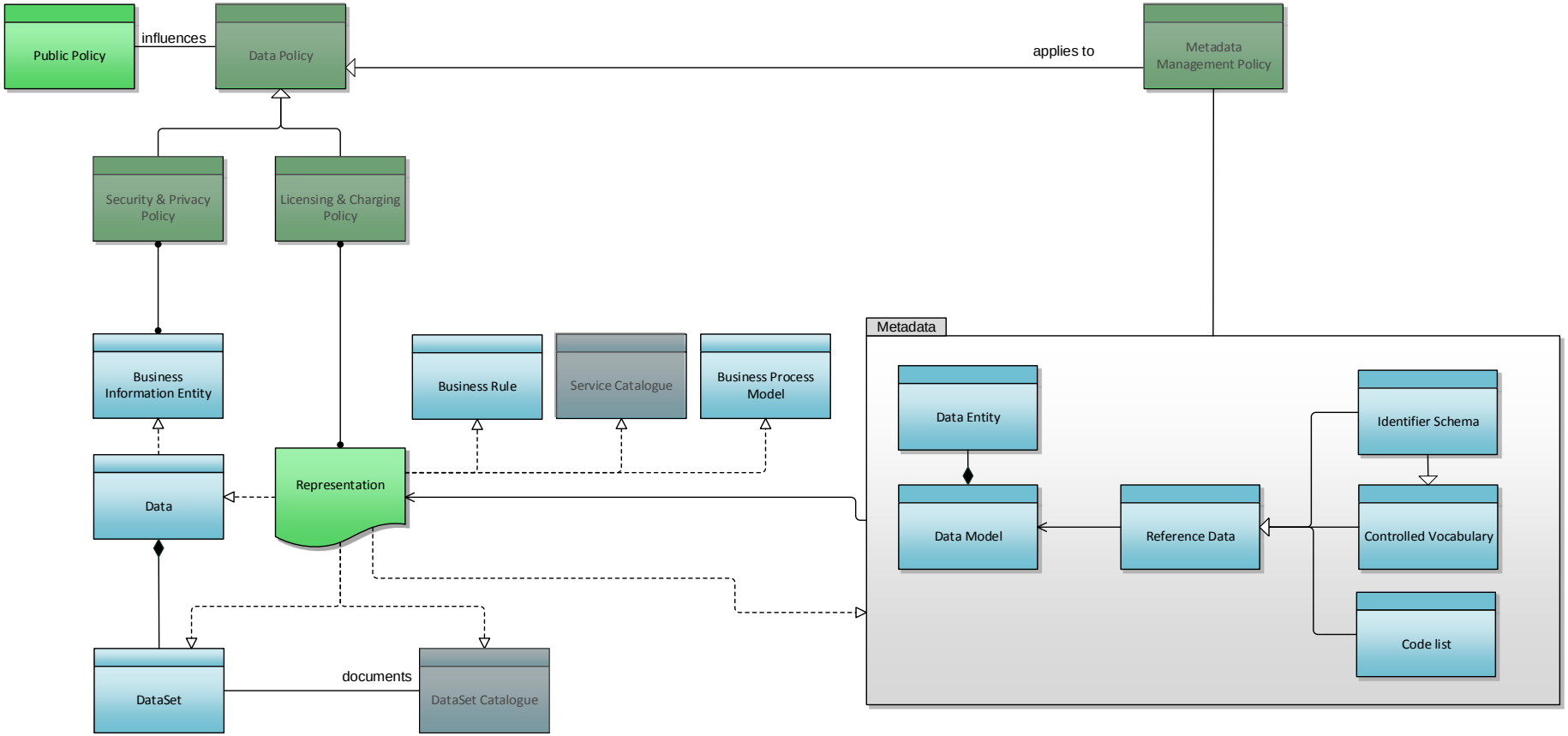
[Organisations] on [EU / national / sub-national level] in the role of Service Providers supply interoperable billing [Public Services] to [Public Administrations] and/or [Businesses] and/or [Citizens] in the role of users according to a [Service Delivery Model]. Organisations which are collaborating on the development of the billing system, can sign an [Interoperability Collaboration Agreement]. With the aim of delivering the billing public service, the service provider proposes and the user accepts an [interoperability service agreement]. [Service providers] can sign an [Interoperability supplier agreement] to agree on how to deliver the billing service to their users.

The delivery of these services is realised through billing [Business Processes] that follow a [Business Process Model]. Business processes contain [Business Information exchange], which enclose [Business Transactions] of defined [Business Information Entities] (e.g. invoices). Business processes and business information entities are subject to [Business Rules] originating from the [public policy].

Semantic view

European Commission

Semantic View



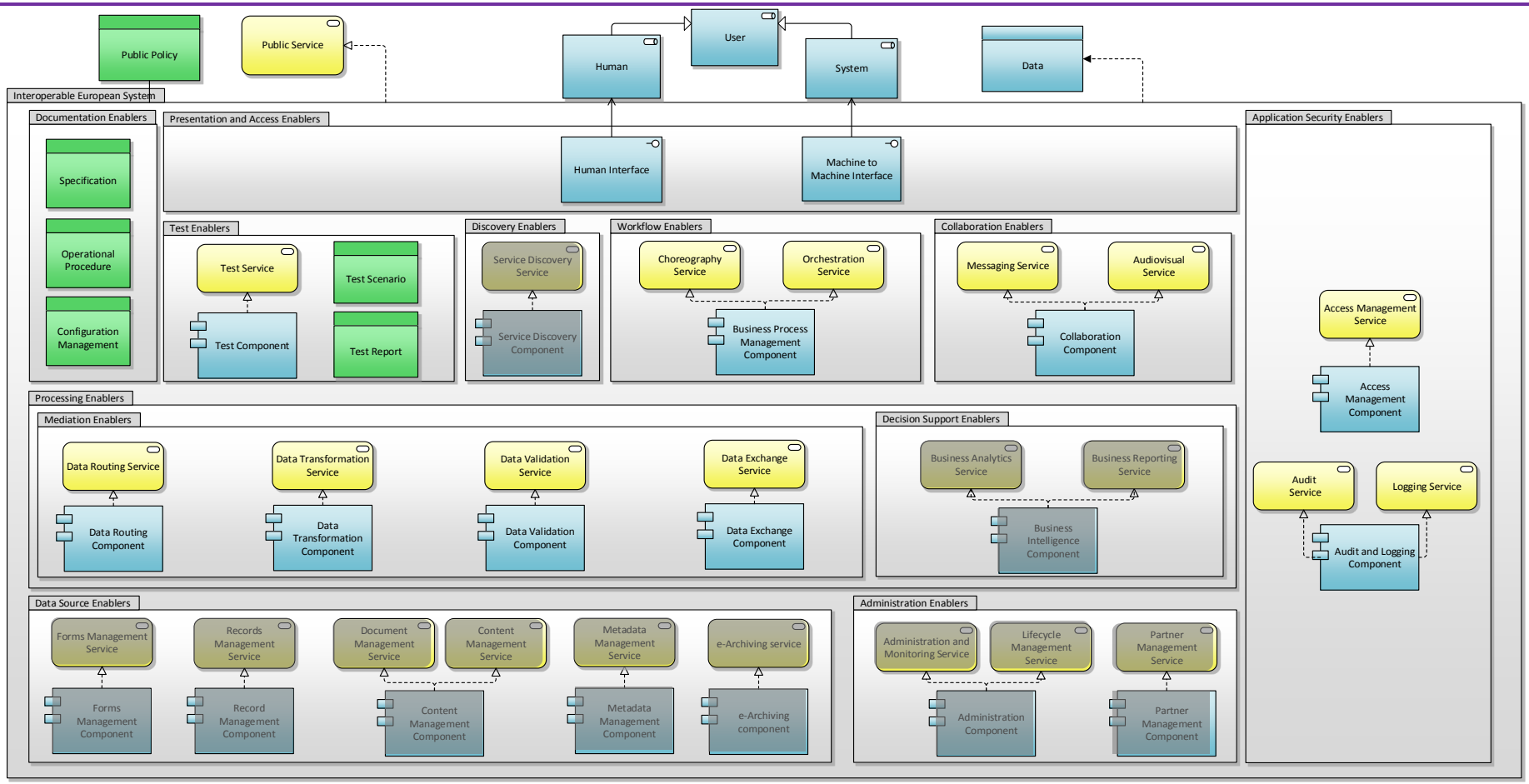
Narrative of the Semantic view

Billing [Data], which is grouped in [data sets], is represented using a specific [representation] format. [Business rules] and billing [business process models] are also subject to a representation. [Metadata], composed of [Data models] and [Reference data], provide the structure for a [representation]. The reference data include [Identifier Schemas] (e.g. structure of the ID of a supplier), [Controlled Vocabularies], and/or [Code lists] (e.g. code lists of EU countries).

Technical view – Application

European Commission

Technical View - Application



DO NOT DISTRIBUTE FURTHER

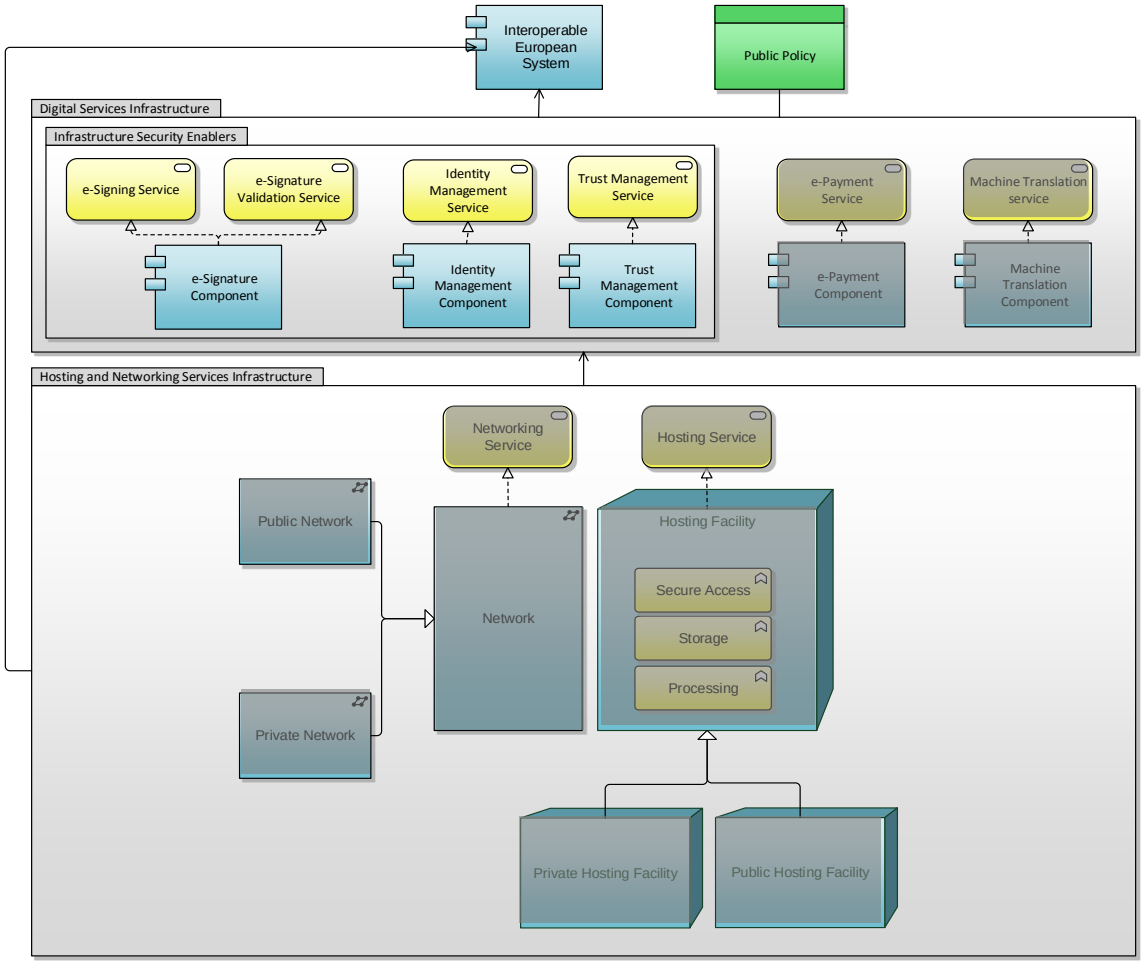
Narrative of the Technical view – Application

A billing [Interoperable European System (IES)] implements the billing [Public Services] and supports or implements one or multiple [Public Policies]. The IES can be accessed by [Users], which can be [humans] or [systems], through [Presentation and Access enablers]. The IES is documented through [documentation enablers] and is tested through the use of [test enablers]. Billing information can be exchanged cross-border with the support of [mediation enablers]. The system can execute the billing business processes through [workflow enablers].
Access control and data security are managed through the services offered by [application security enablers], involving [access management components] and [audit and logging components].

Technical view – Infrastructure

European Commission

Technical View - Infrastructure



Narrative of the Technical view – Infrastructure

A billing [Interoperable European System (IES)] can make use of [infrastructure security enablers] to manage the security of the exchange billing information (e.g. e-Signature on billing documents).

Architectural Solution template 3: Interoperable European User Authentication system

Interoperable European User Authentication system

Goal

This architectural solution templates addresses the interoperability aspects that need to be taken into account when developing of an interoperable European User Authentication system. The architectural solution template focuses on the building blocks of the EIRA dealing with security at all interoperability levels.

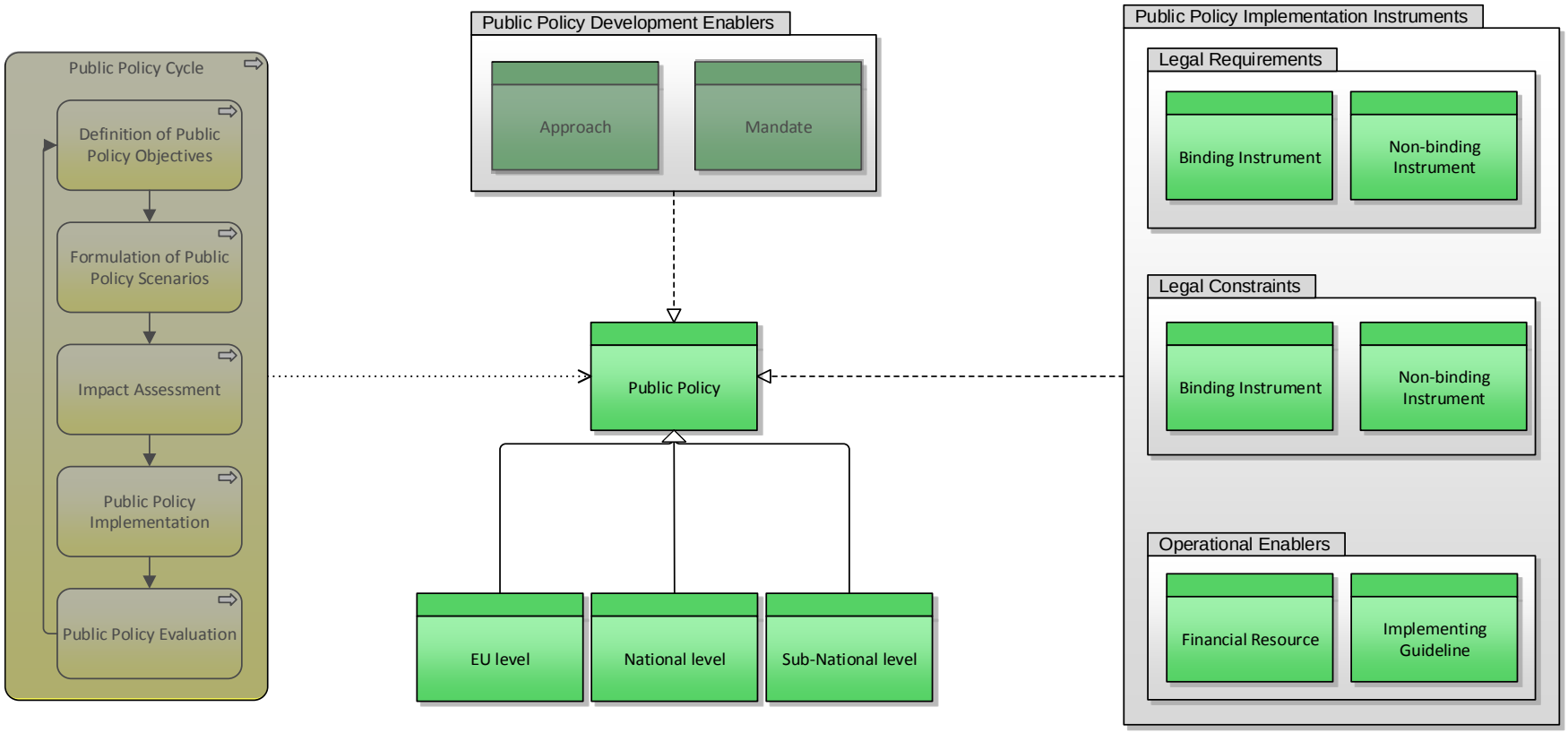
Comments

This solution template takes into account:

- At legal level, the relevant EU policies that need to be taken in the field of information and systems security;
- At organisational level, the user and providers of the authentication services, and the underlying security processes;
- At semantic level, the format of the information relevant for user authentication (e.g. user credentials);
- At technical level, the applications that are supporting the implementation of the authentication mechanisms, and the network through which authentication data is transported.

Legal view

Legal View



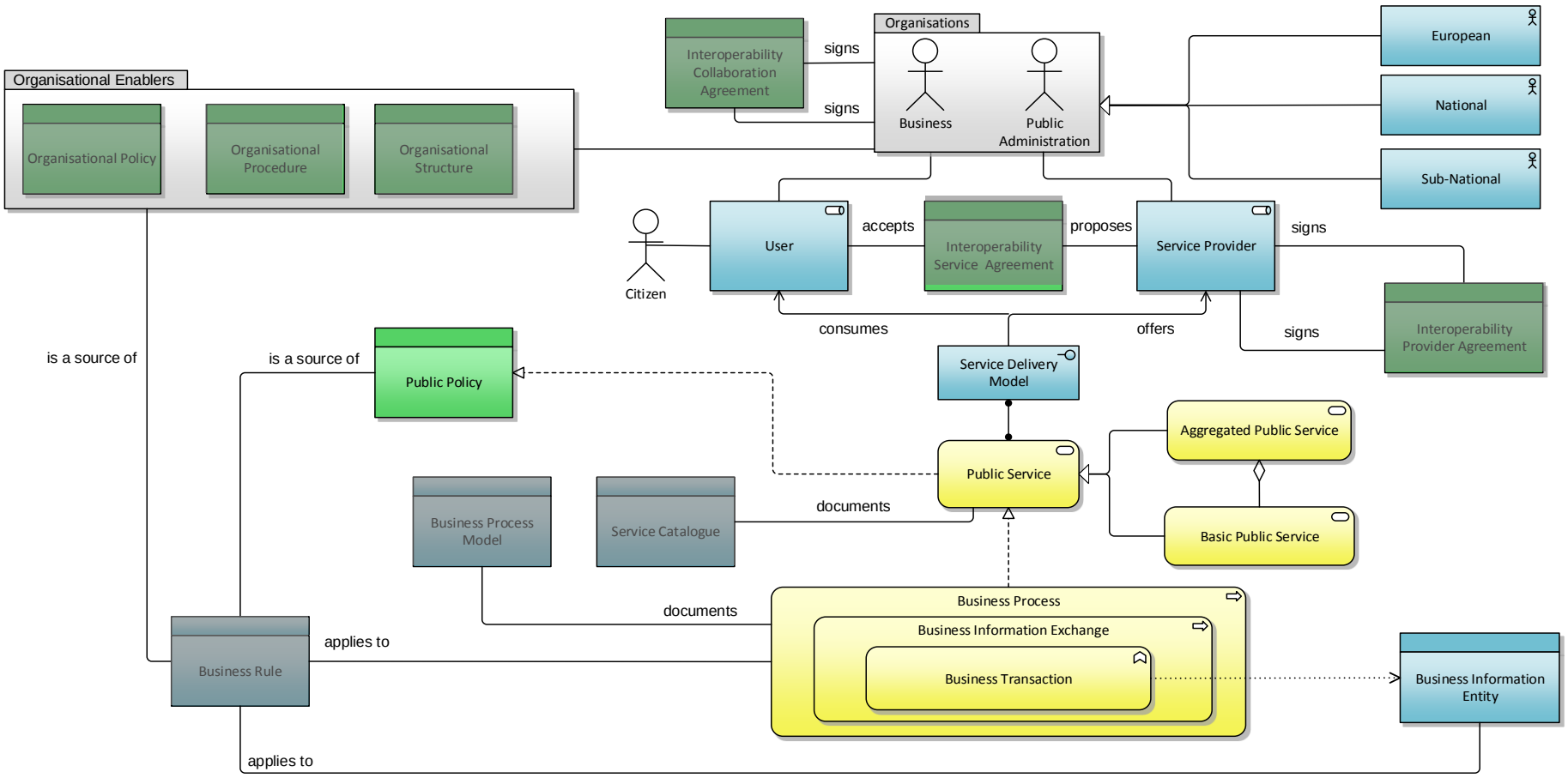
Narrative of the Legal view

A [public policy] in the field of information security, at [EU level, National level or Sub-national level] can have an impact on or mandate the implementation of an Interoperable European User Authentication System. The policy is implemented through policy instruments, which can be [binding / non-binding] [legal requirements or constraints], or operational enablers, in the form of [financial resources] and [implementing guidelines].

Organisational view

European Commission

Organisational View



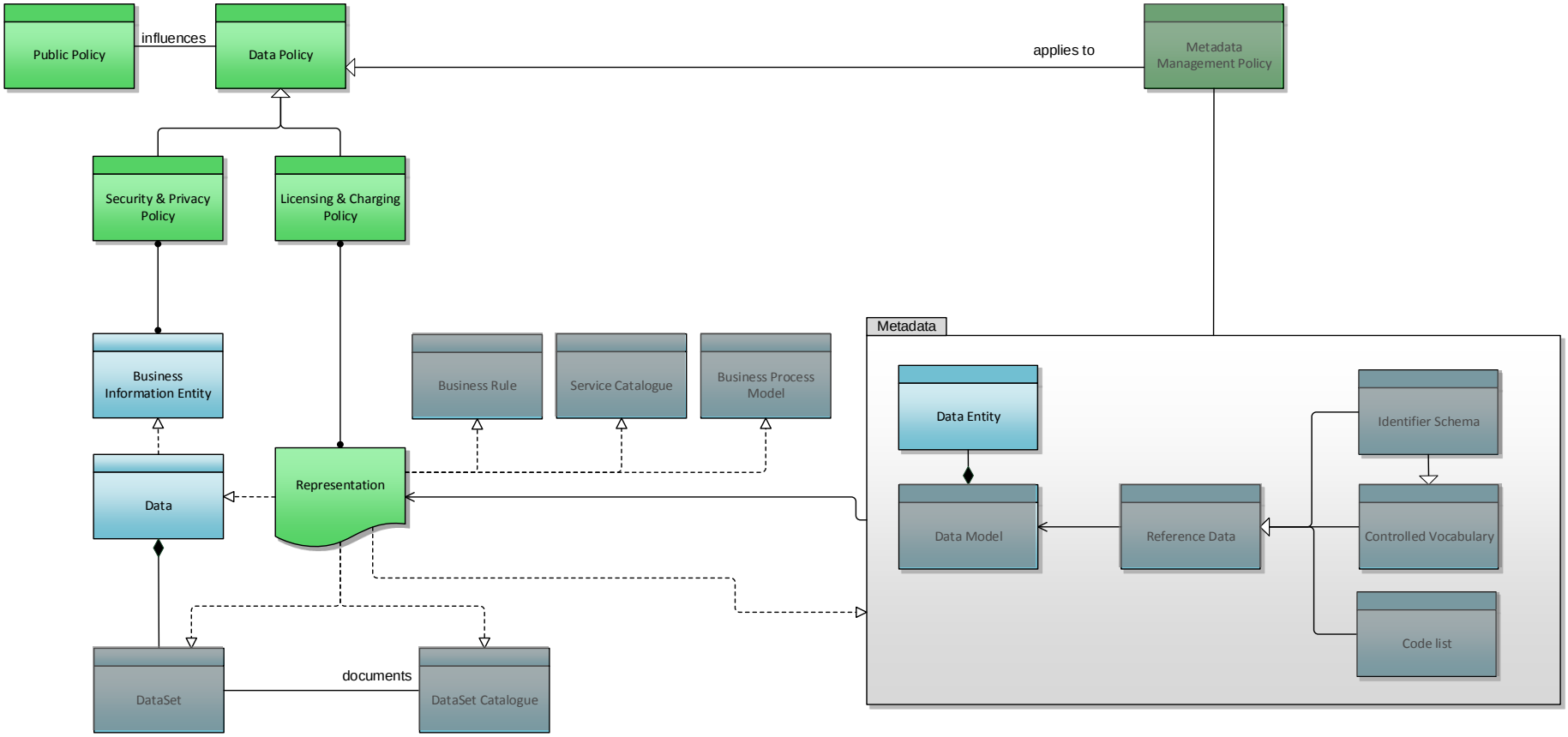
Narrative of the Organisational view

[Organisations] on [EU / national / sub-national level] in the role of Service Providers supply interoperable user authentication [Public Services] to [Public Administrations] and/or [Businesses] and/or [Citizens] in the role of users according to a [Service Delivery Model].
The delivery of these services is realised through [Business Processes] (e.g. provisioning, authentication). Business processes contain [Business Information exchange], which enclose [Business Transactions] of defined [Business Information Entities] (e.g. user credentials).

Semantic view

European Commission

Semantic View



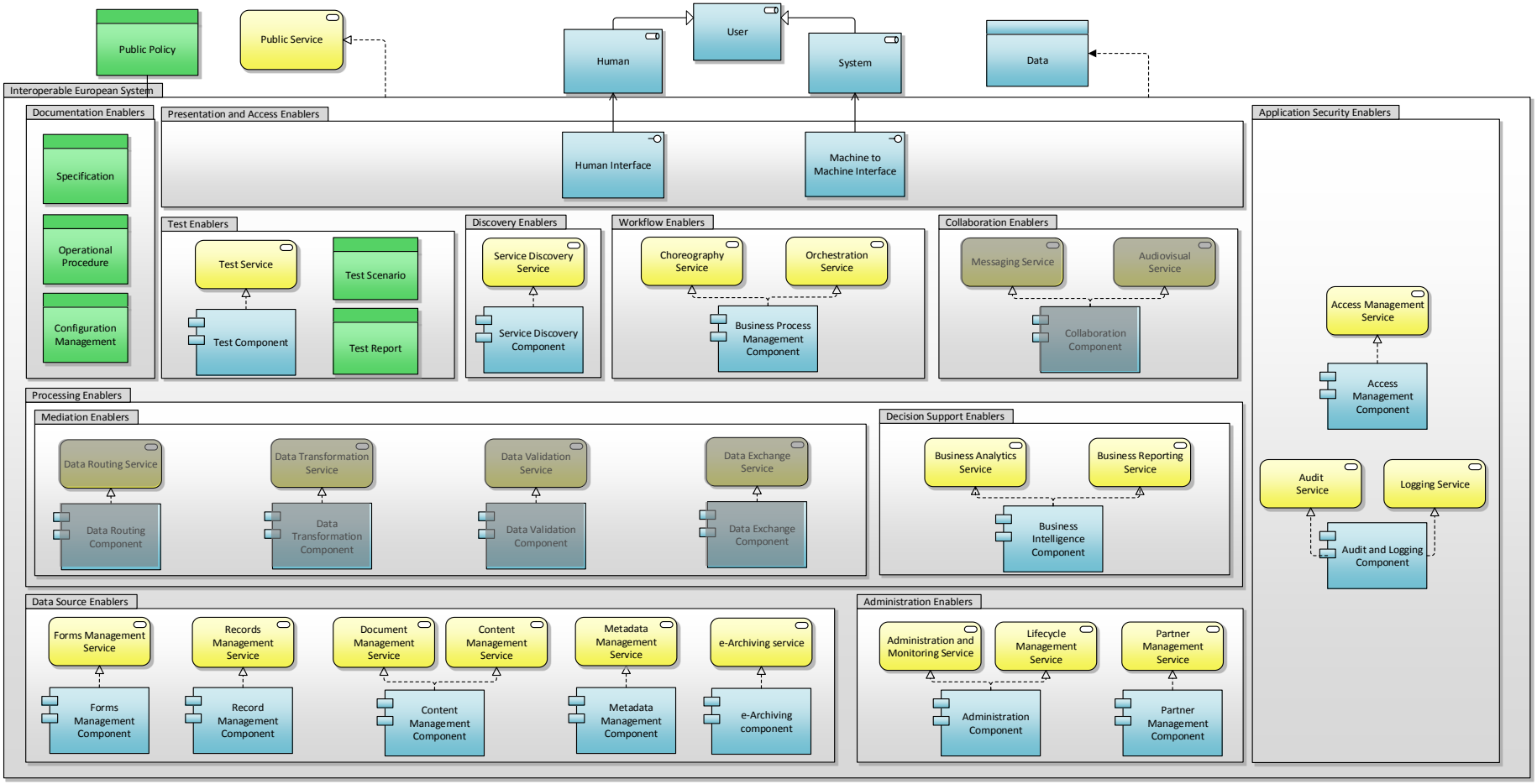
Narrative of the Semantic view

Authentication [Data] is represented using a specific [representation] format. [Data entities] provide the structure for the [representation]. Security data are treated and managed according to specific [Data policies], including [Security and Privacy policies] and [Licensing and Charging Policies].

Technical view – Application

European Commission

Technical View - Application



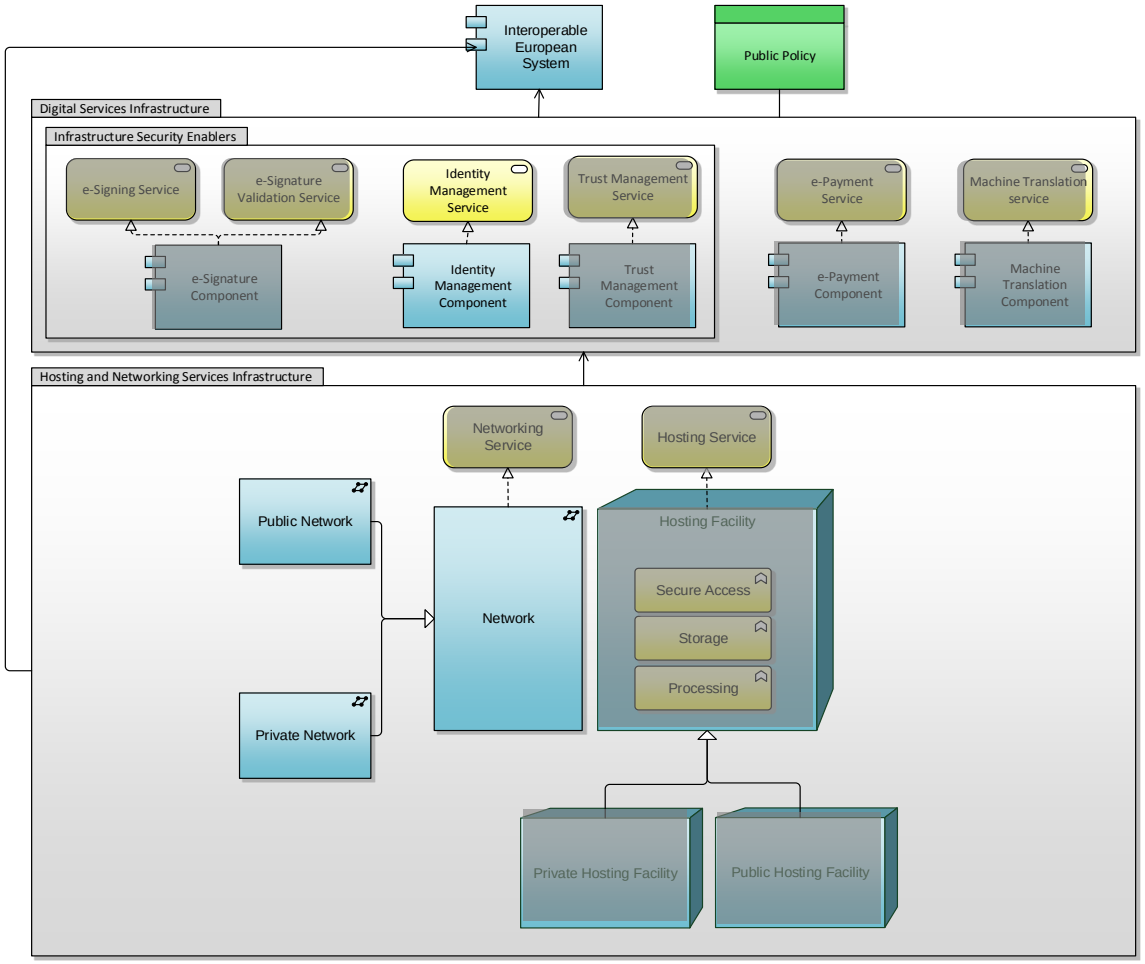
Narrative of the Technical view – Application

A user authentication [Interoperable European System (IES)] implements the authentication [Public Service] and supports or implements one or multiple [Public Policies]. The IES can be accessed by [Users], which can be [humans] or [systems], through [Presentation and Access enablers].

Technical view – Infrastructure

European Commission

Technical View - Infrastructure



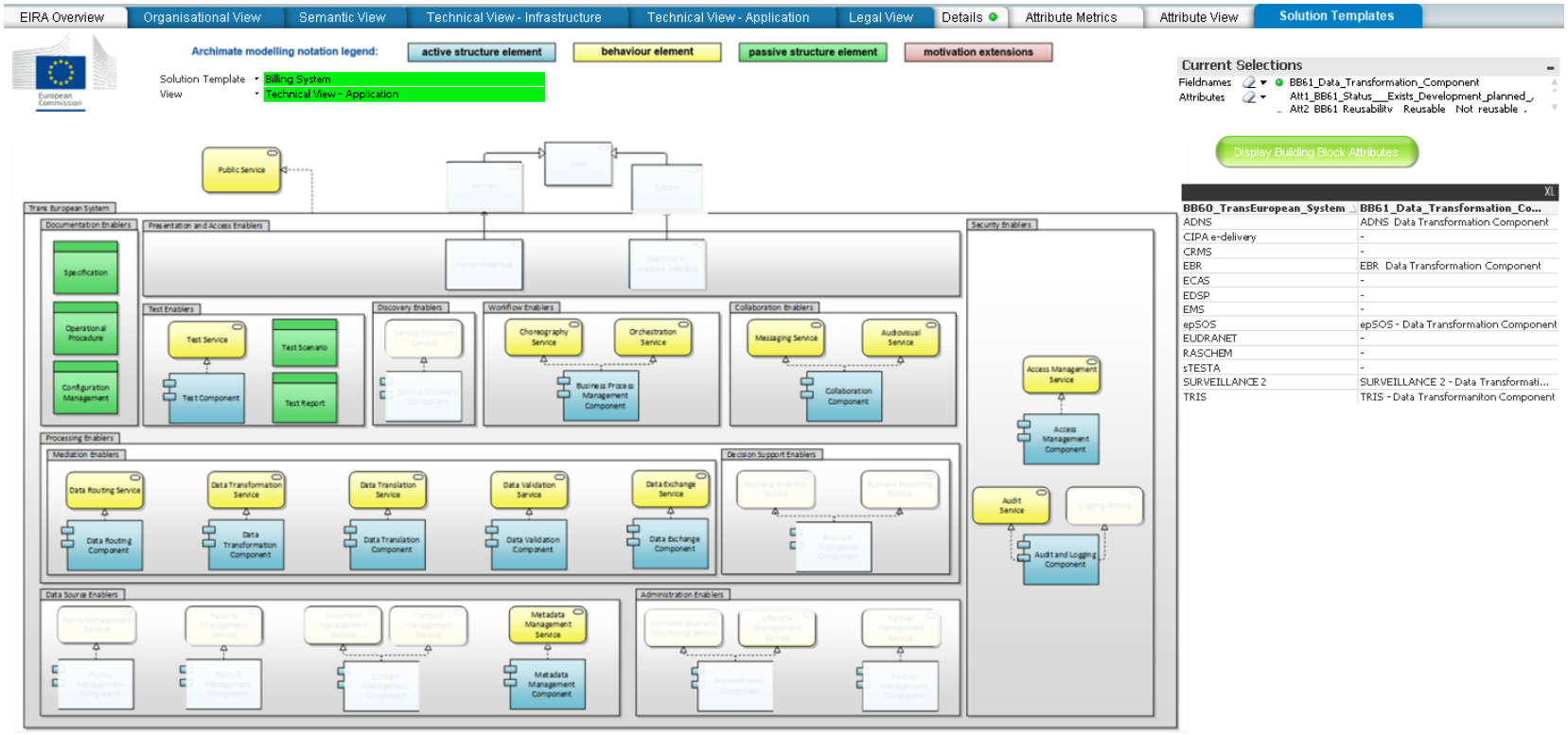
Narrative of the Technical view – Infrastructure

A user authentication [Interoperable European System (IES)] uses infrastructure security services like the [identity management service]. It has to ensure secure exchange of information through [public networks] or [private networks].

Implementation in the Cartography tool

Cartography tool – Architecture solution templates

The architectural solution templates are integrated as active elements in the graphical user interface of the Cartography tool. The building blocks of the architectural solution template can be used (i.e. clickable) to retrieve additional information on the corresponding solutions and related attributes (e.g. the reusability of the solution). Below an example of the implementation of an architectural solution template in the Cartography tool.



Annex

- Annex 1 - Architectural Solution template 1 example: IMI
- Annex 2 - Architectural Solution template 2 example: e-Prior
- Annex 3 - Architectural Solution template 3 example: ECAS

Annex 1

Architectural Solution template 1:
Administrative Cooperation through Information Exchange

Example: IMI

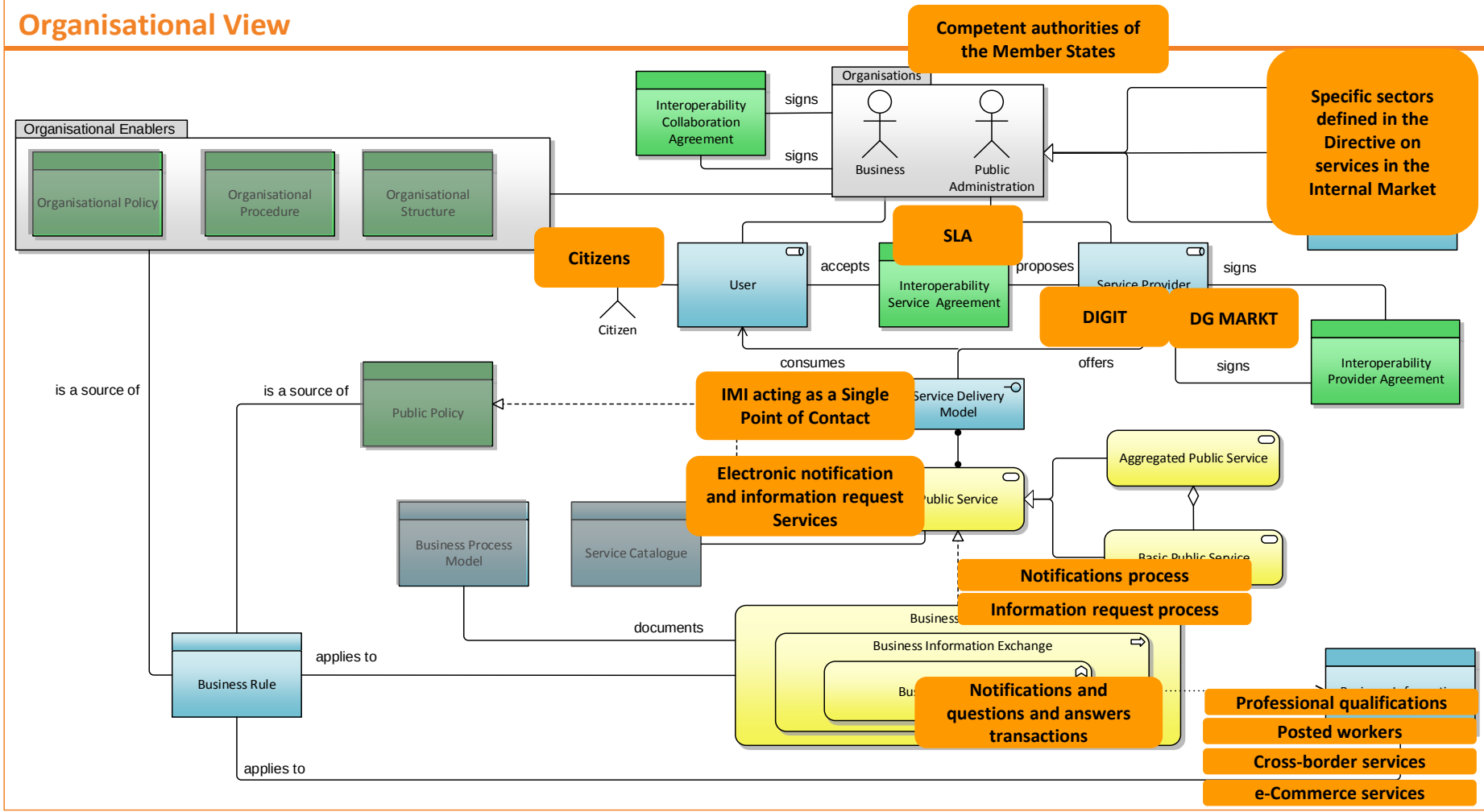
Example case – IMI

Why this case?

- The Internal Market Information System (IMI) is one of the TES solutions that is involved in the EIA action, which supports Administrative Cooperation between Member States.
- IMI provides a secure online accessible application which supports the communication of national, regional and local administrations with their equivalent instances in other countries.

Organisational view

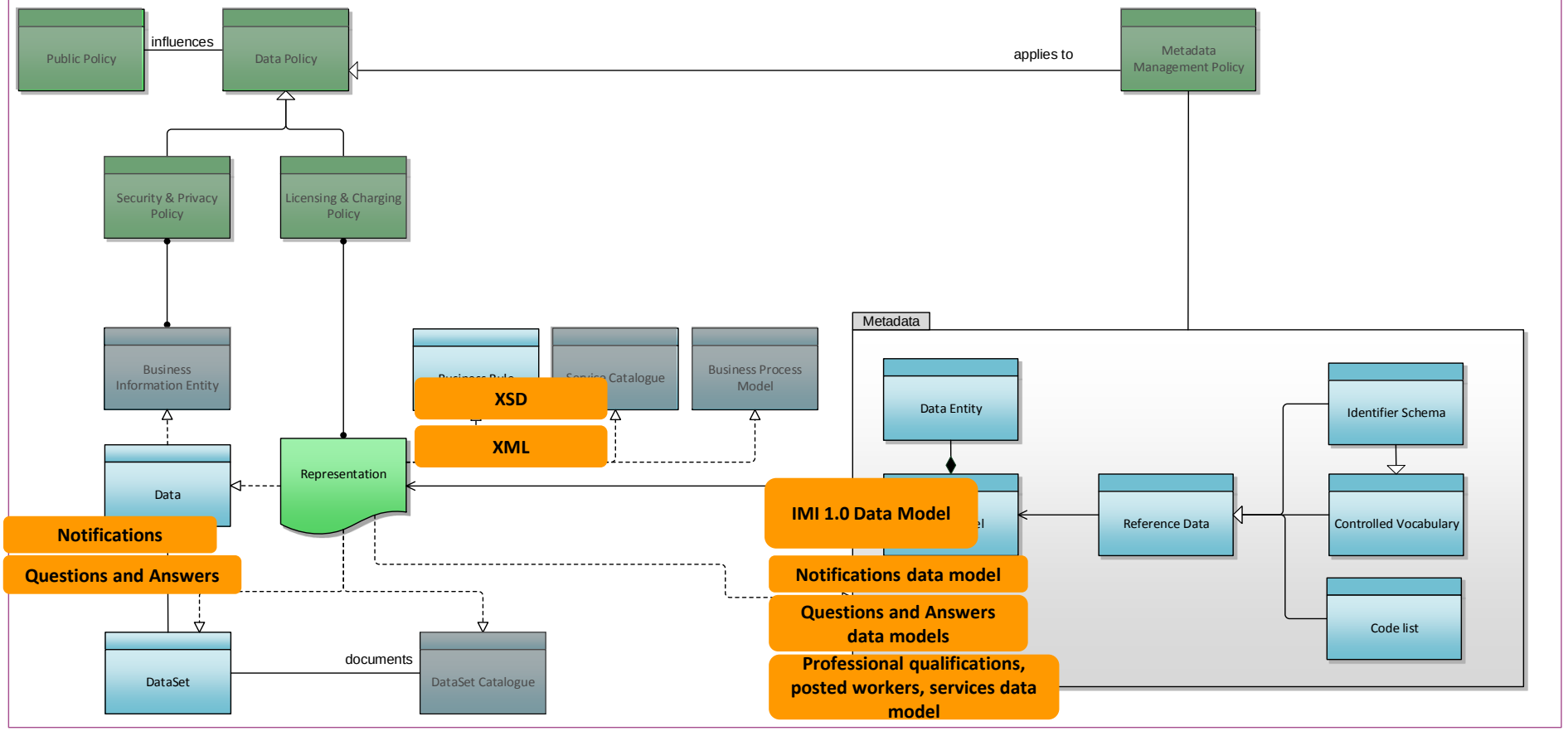
Organisational View



Semantic view

European Commission

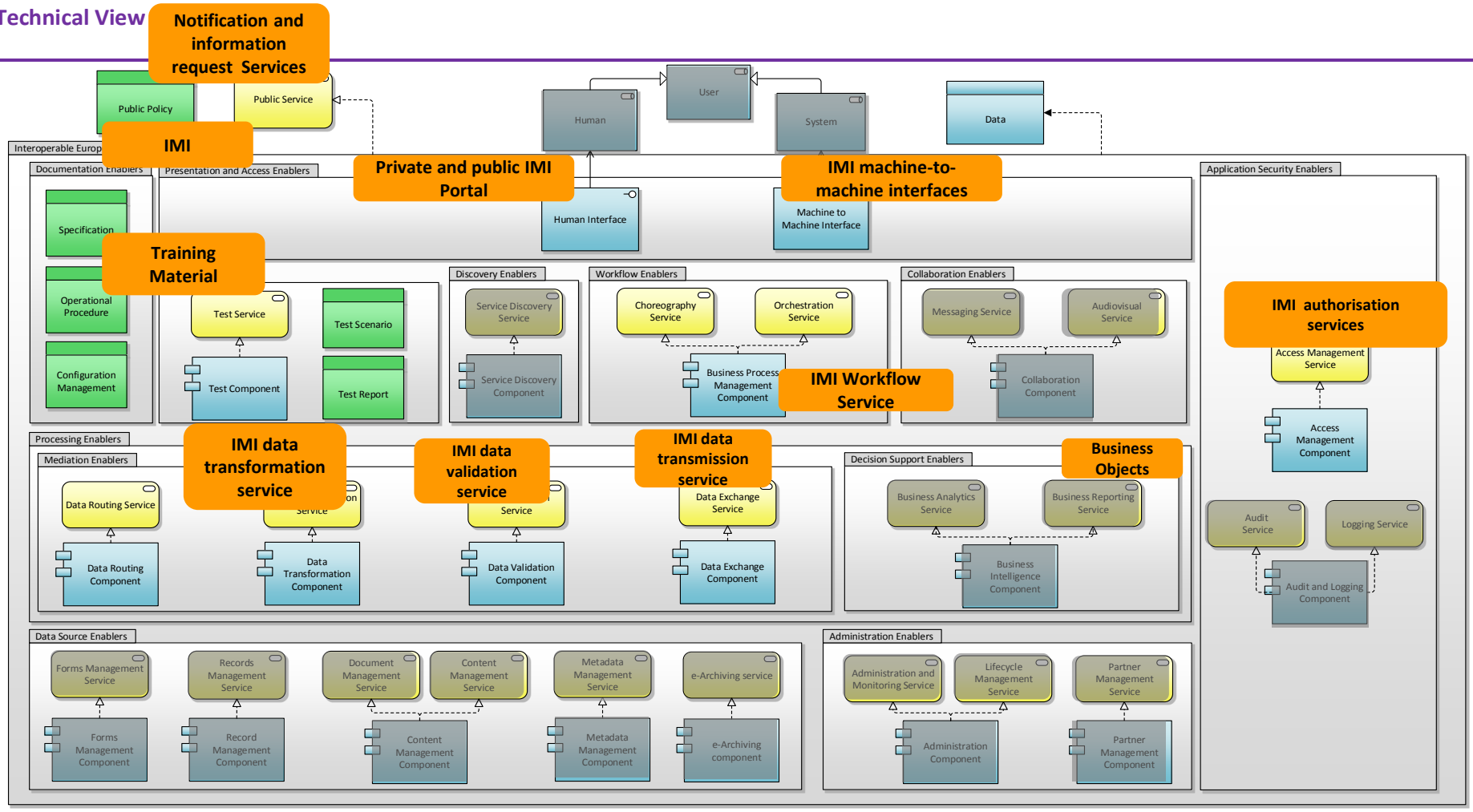
Semantic View



Technical view – Application

European Commission

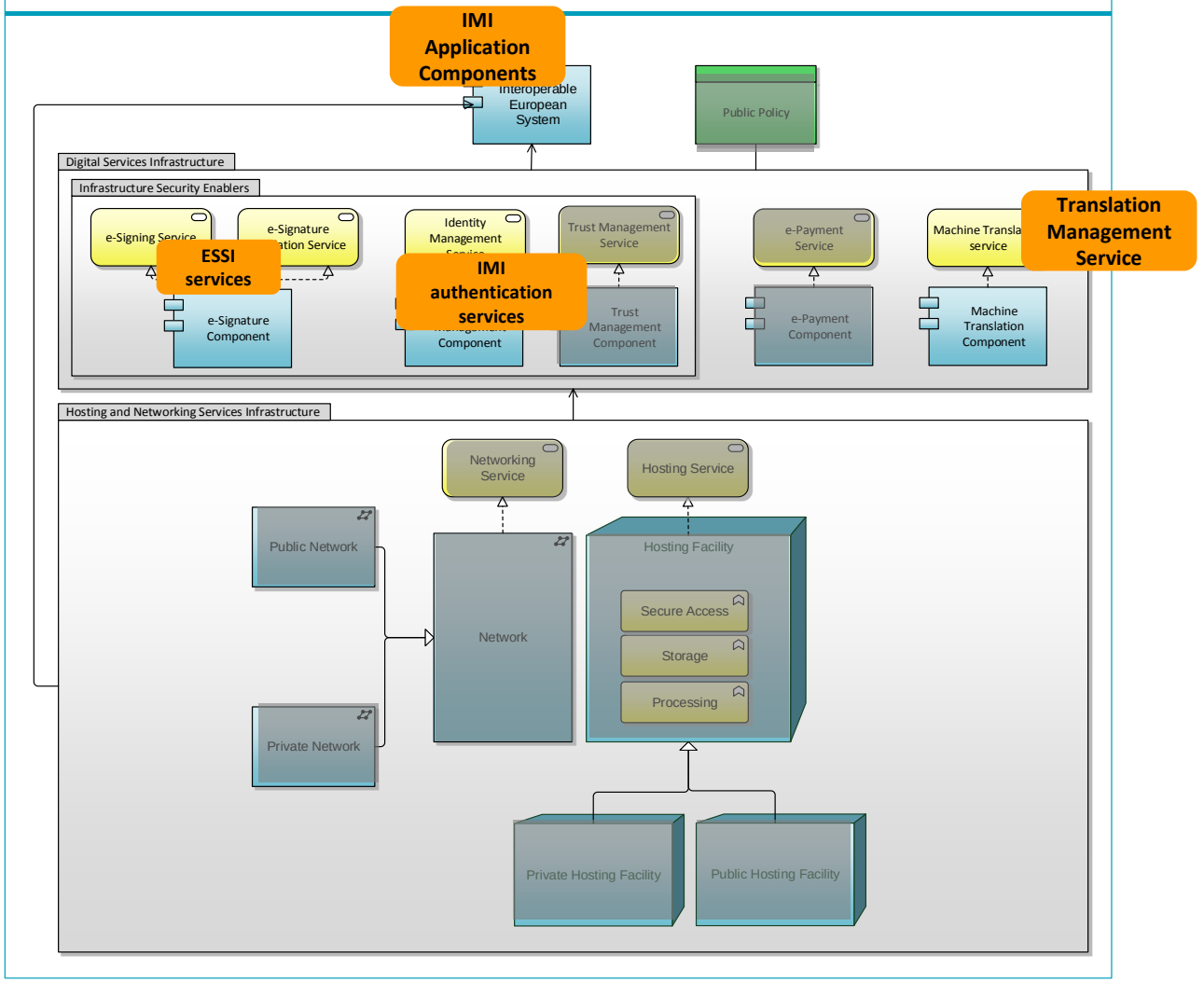
Technical View



Technical view – Infrastructure

European Commission

Technical View - Infrastructure



Annex 2

Architectural Solution template 2: Interoperable European billing system

Example: e-Prior

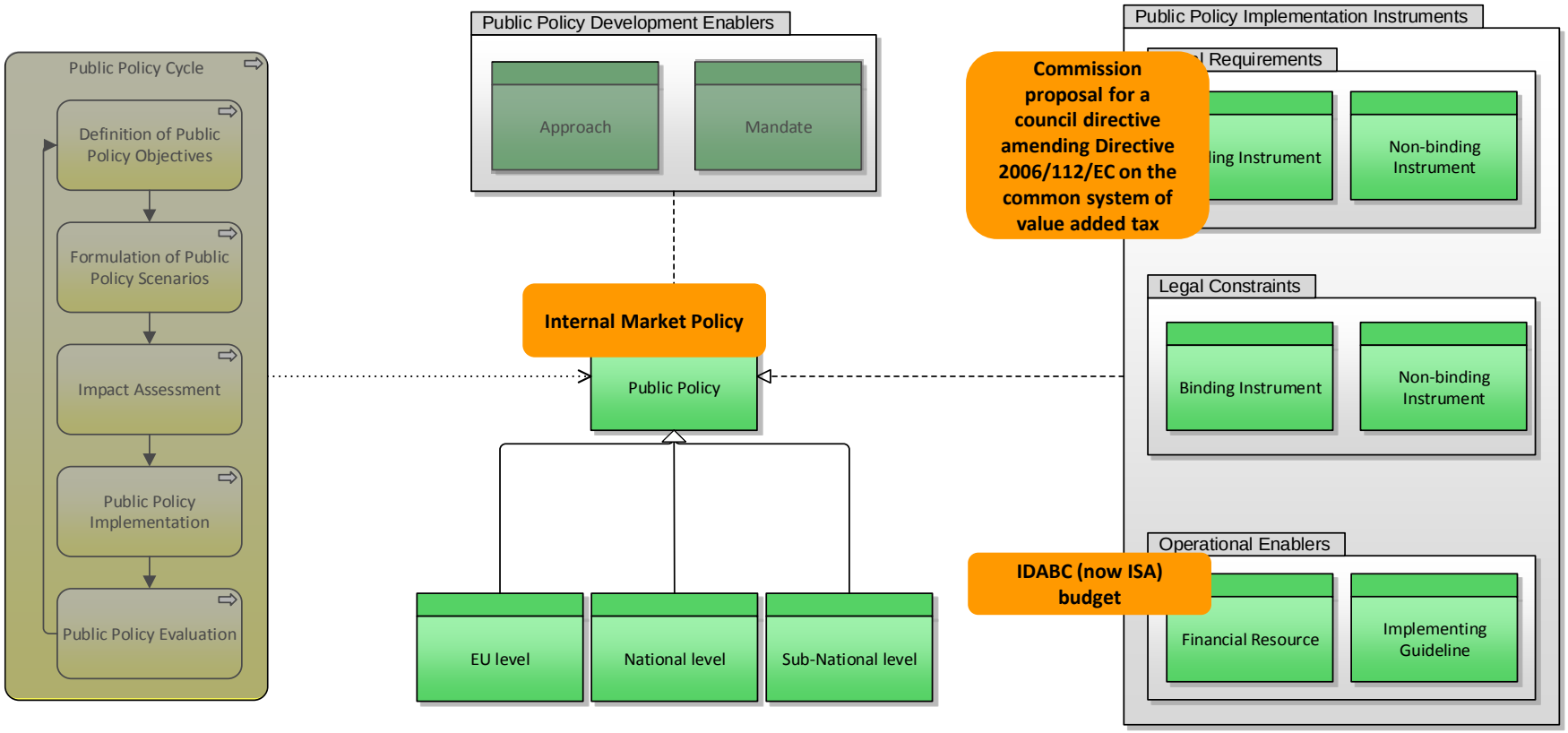
Example case – e-Prior

Why this case?

- e-Prior is the e-Procurement system developed by DIGIT to receive electronic invoices by suppliers of the European Commission. It also support e-Ordering, e-Catalogues and e-Requests.
- e-Prior is compliant with the CEN/BII stardard, and uses the UBL data model
- e-Prior provides a supplier portal that is accessible from anywhere through the web. It allows the suppliers to process all electronic service requests (e-Request) and it enables the electronic exchange of invocing documents (e-Invoicing).
- An open source version of e-PRIOR has been developed by DIGIT, to be downloaded and implemented by Member States' public administrations.

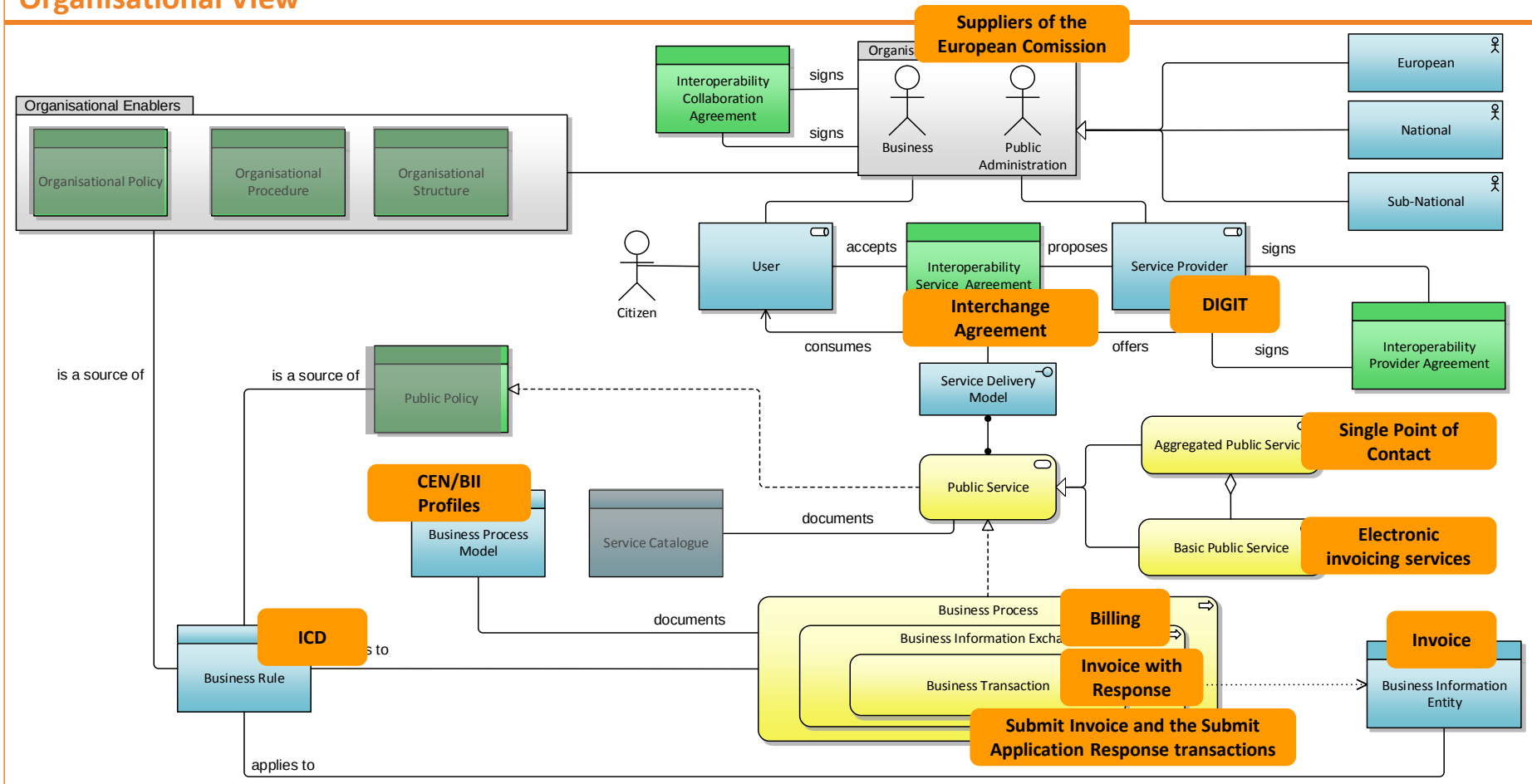
Legal View

Legal View



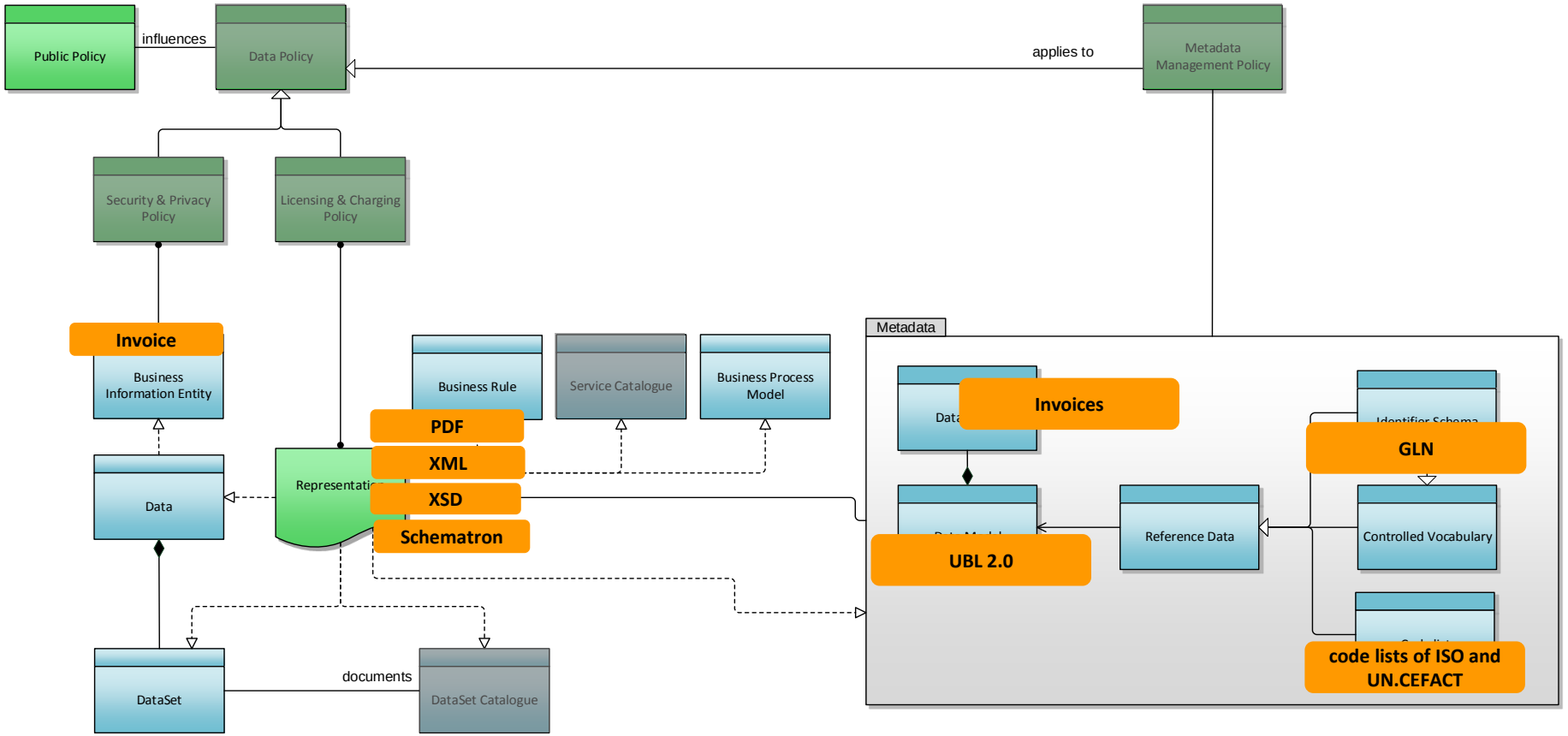
Organisational view

Organisational View

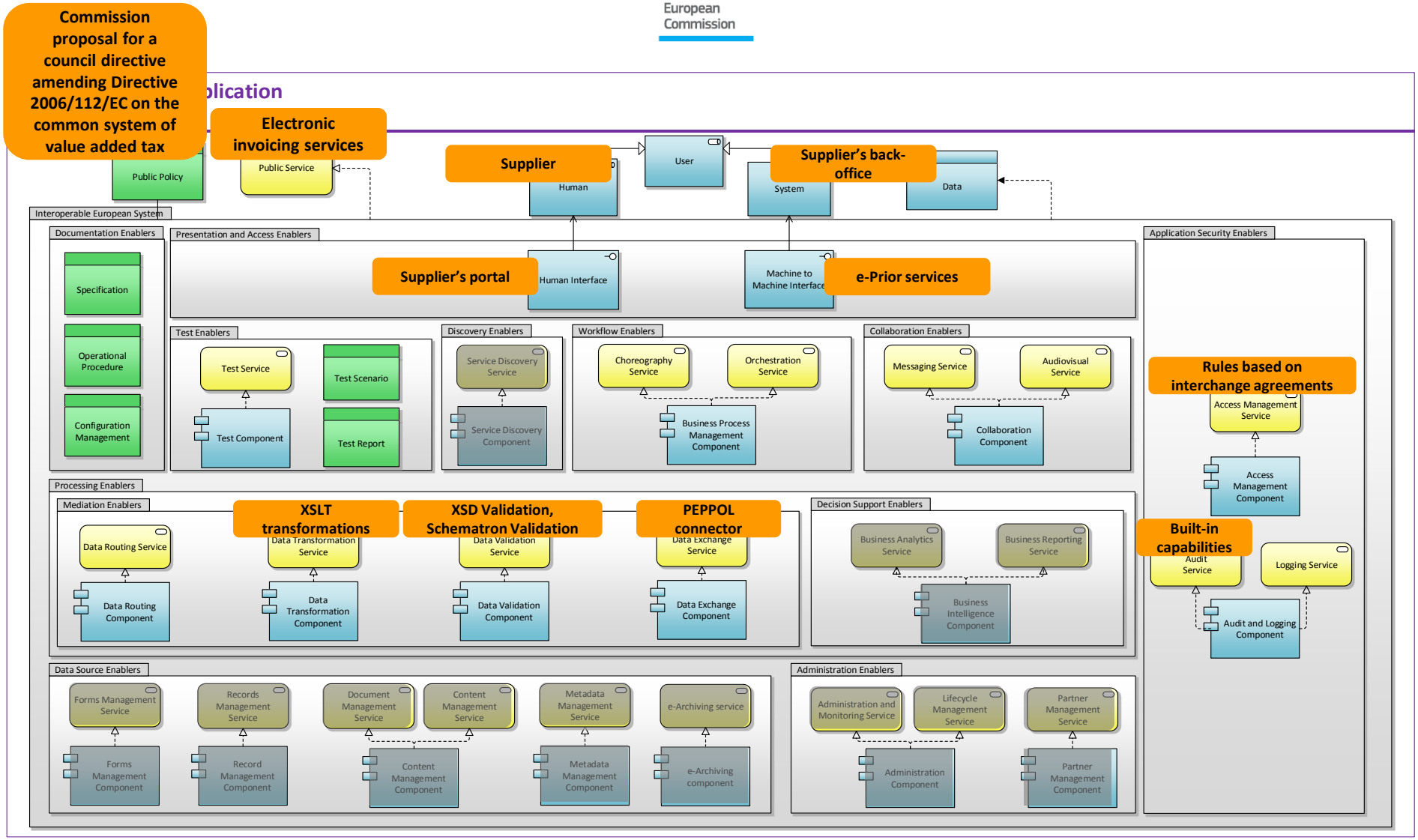


Semantic view

Semantic View



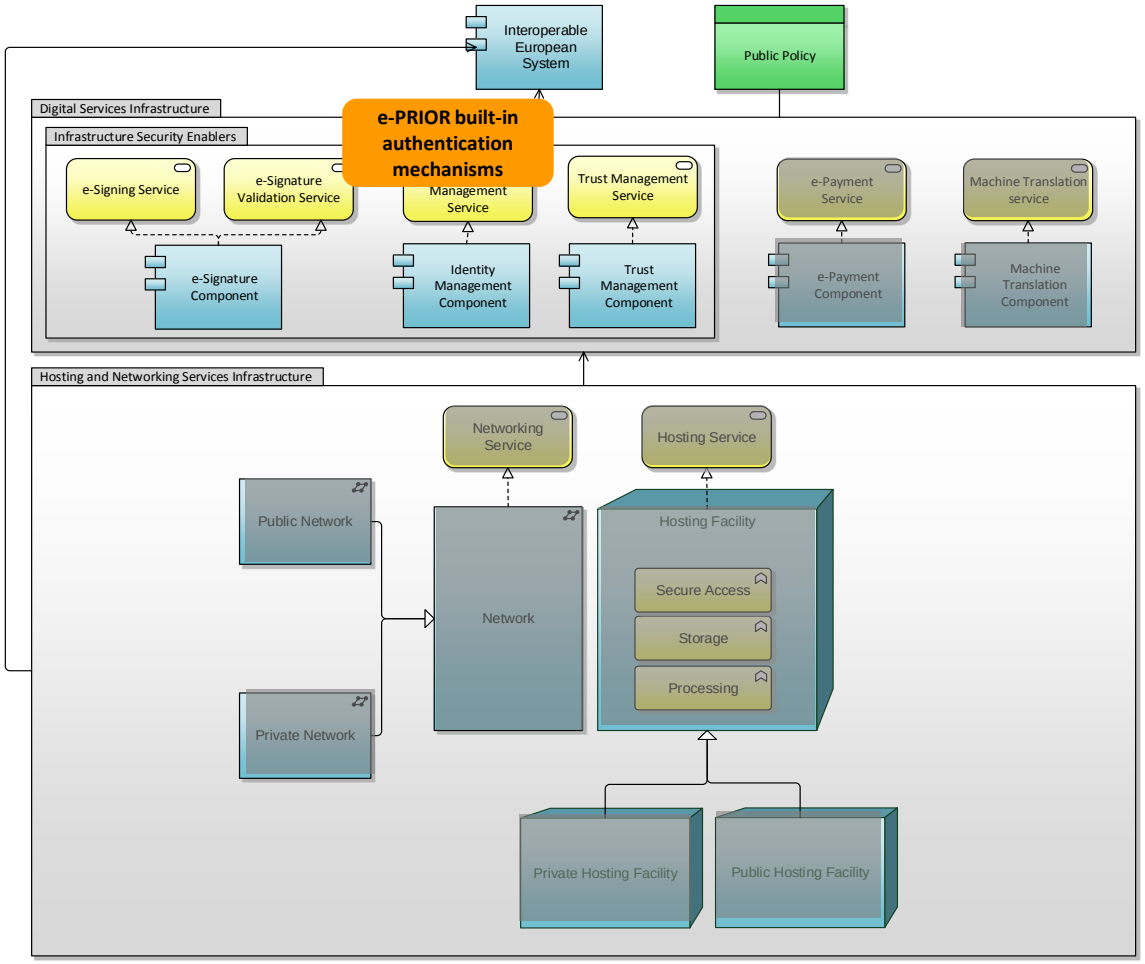
Technical view – Application



Technical view – Infrastructure

European Commission

Technical View - Infrastructure



Annex 3

Architectural Solution template 3: Interoperable European User Authentication system

Example: ECAS

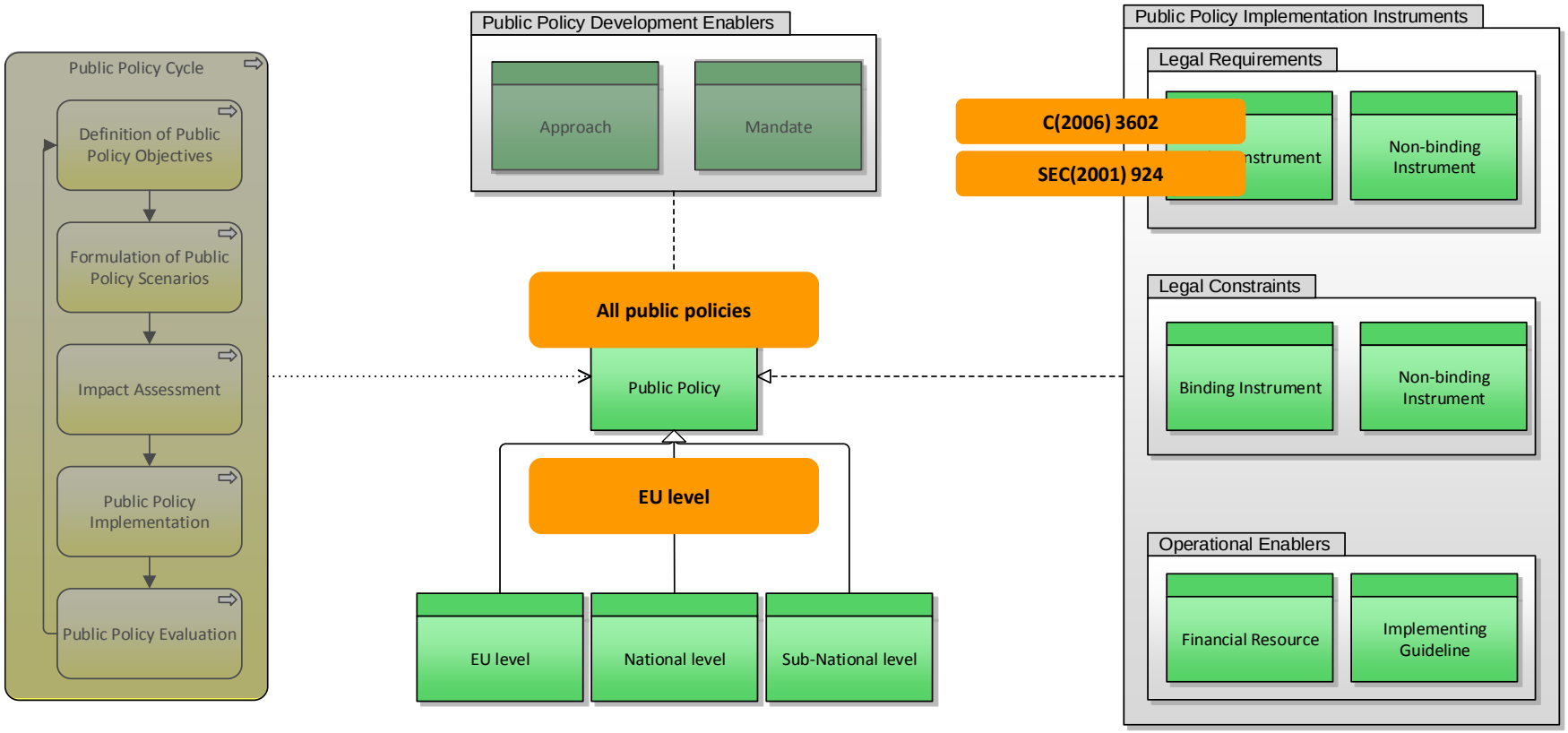
Example case – ECAS

Why this case?

- The European Commission Authentication Service (ECAS) is the security gate to enter into the informatic environnement of the Commission It is the system for logging on to a whole range of web sites and online services run by the Commission. ECAS can be used by the EC staff and by external users that need to access EC applications.
- ECAS is one of the TES system that has been analysed by the TES action of ISA
- In the future, ECAS will be integrated with STORK (European Commission Authentication Service integrated with Secure idenTity acrOss boRders linKed) to complement the user's identity with authorisation information assigned by Member States, such as a user position in a public administration on behalf of which the user is entitled to act.

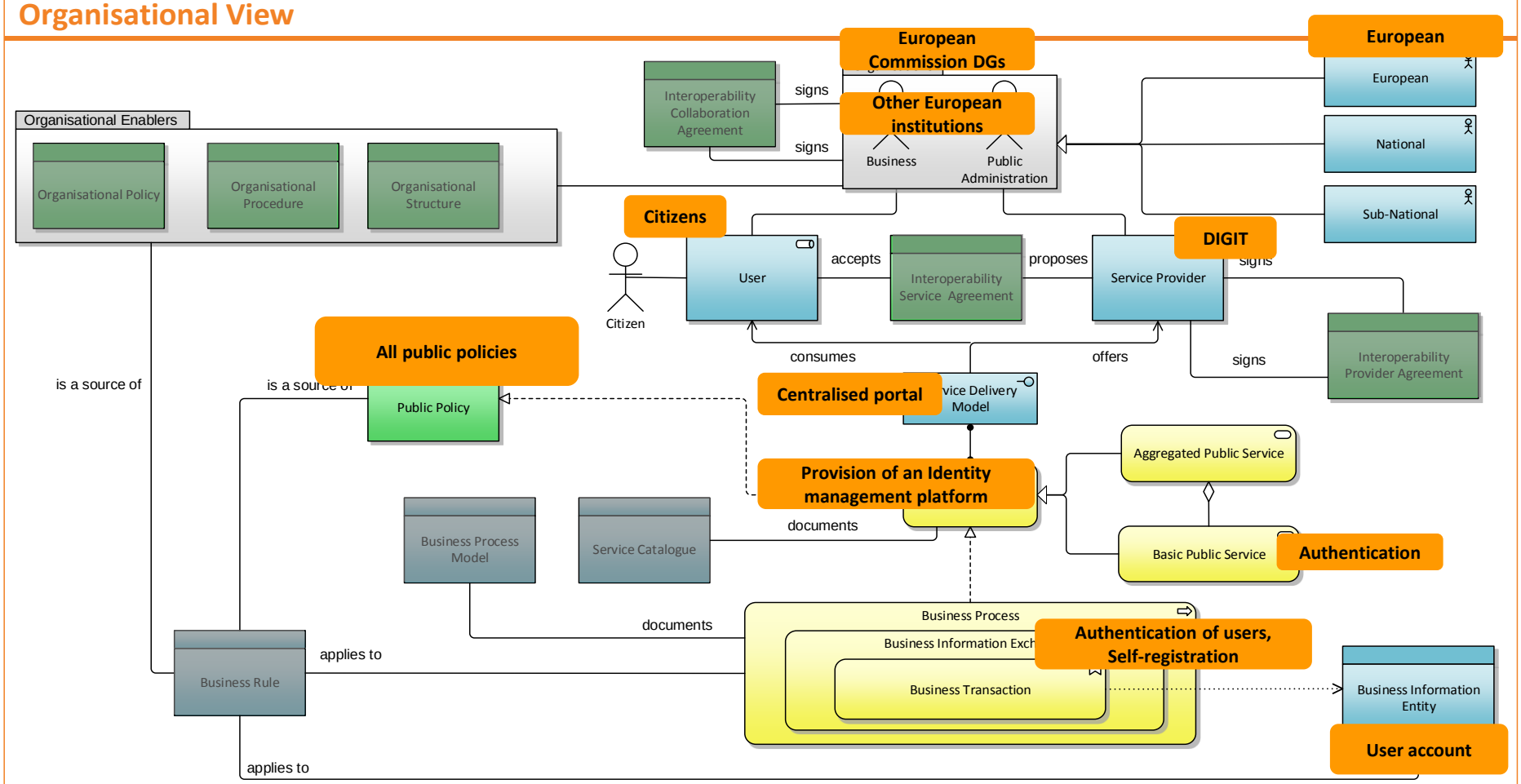
Legal view

Legal View

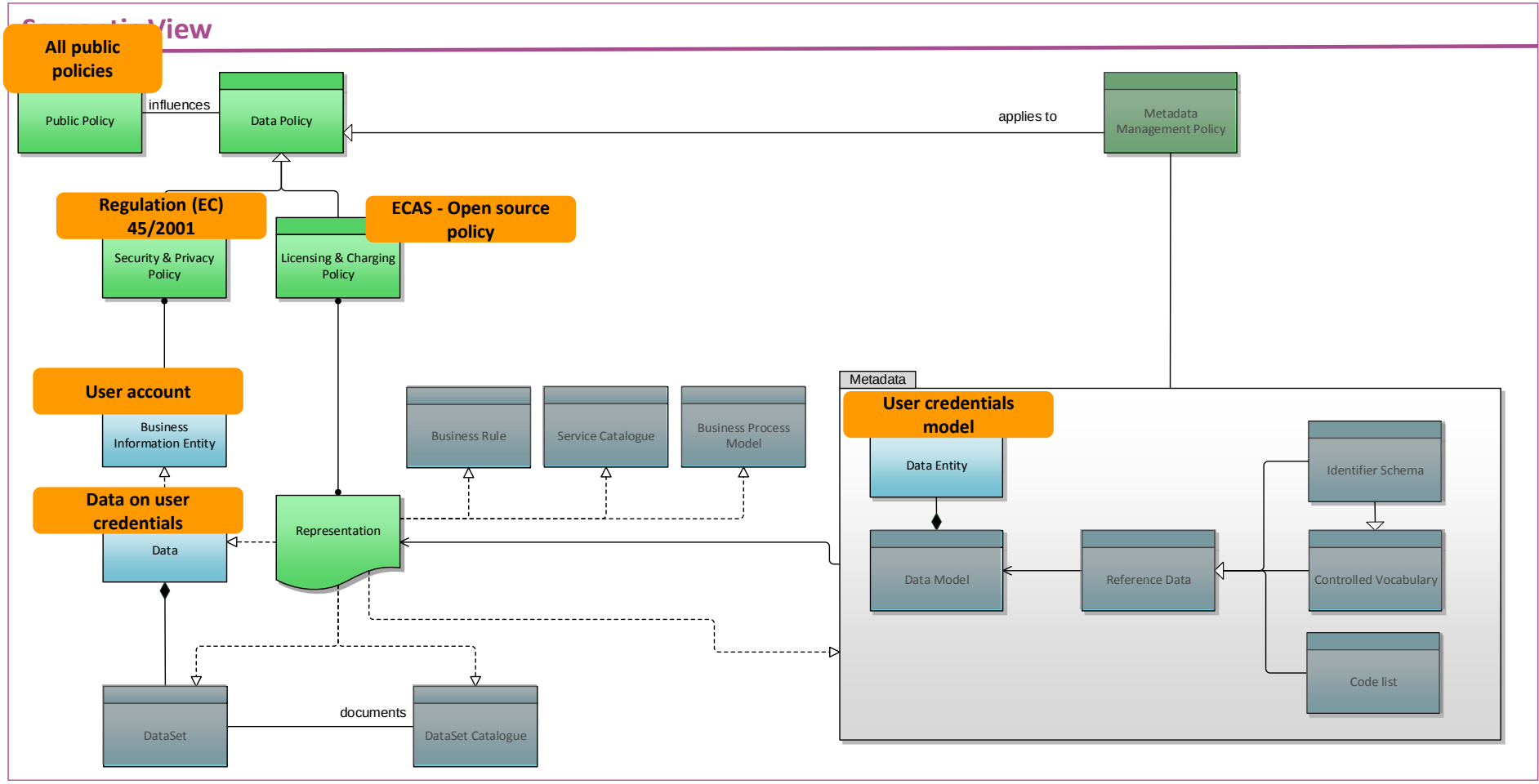


Organisational view

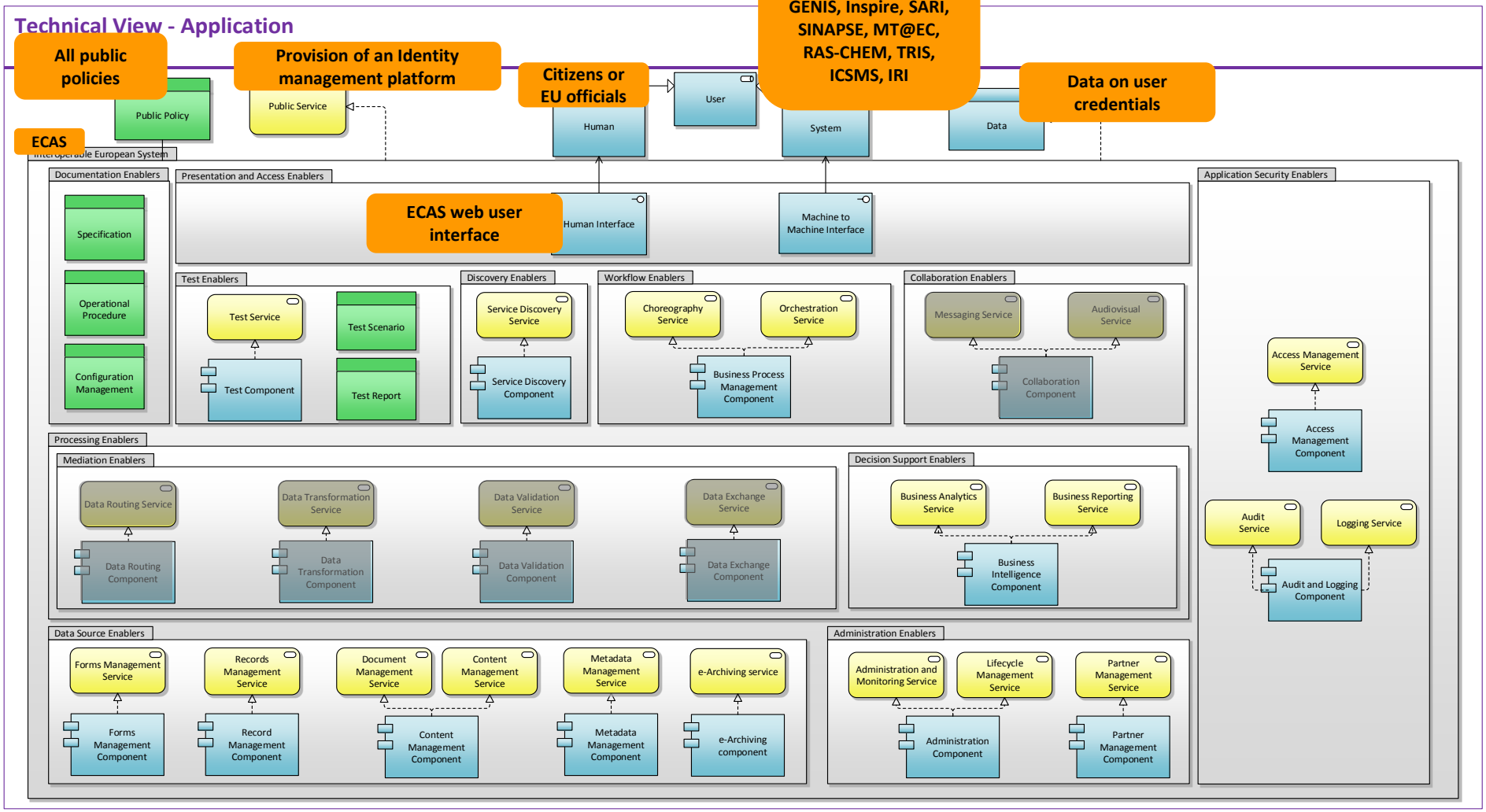
Organisational View



Semantic view



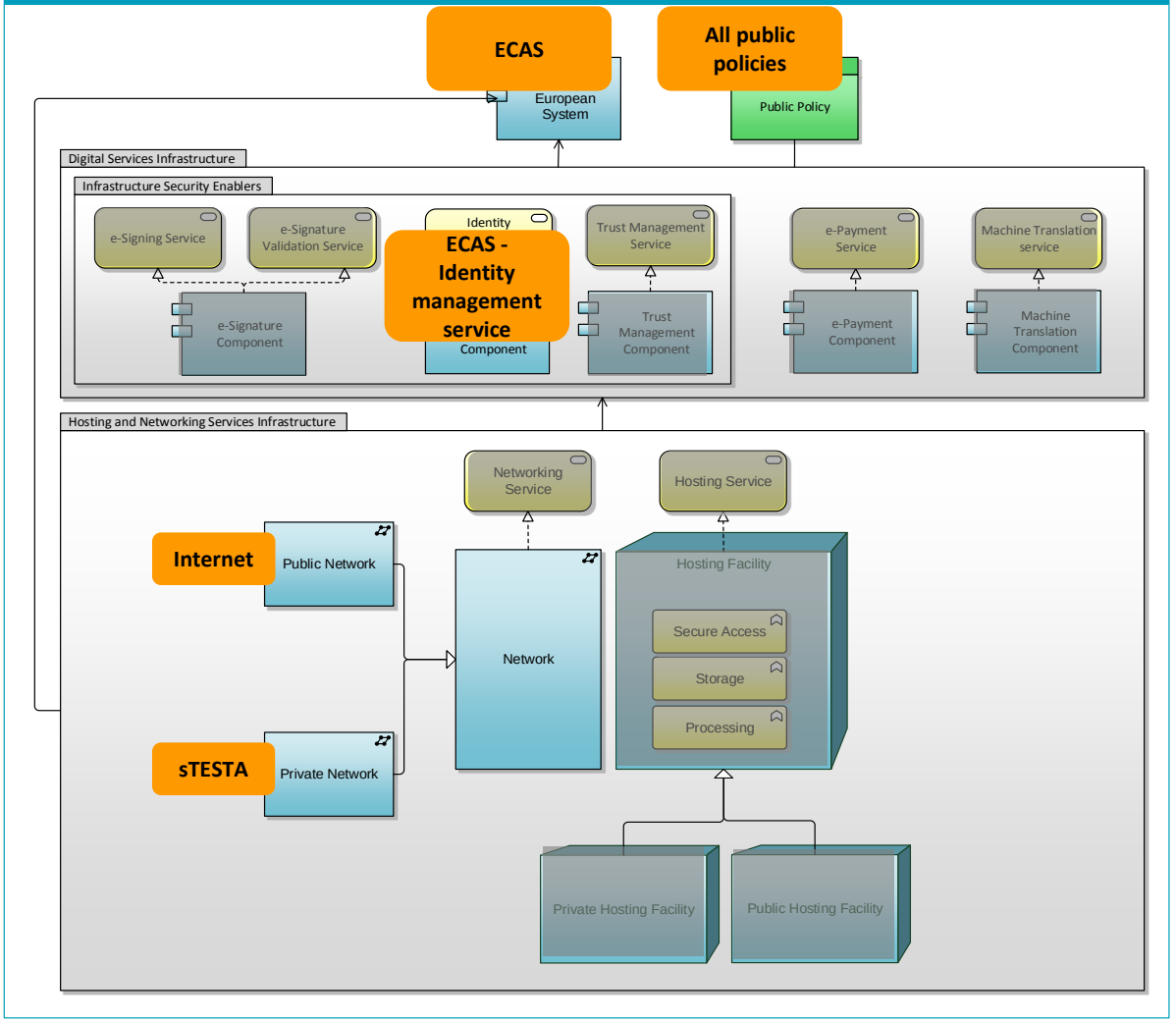
Technical view – Application



Technical view – Infrastructure

European Commission

Technical View - Infrastructure



Contact us

Marco Fichera Lead Architect
+ 32 487 43 08 37

beeia@DELOITTE.com

For more information

EIA project collaborative space	https://webgate.ec.europa.eu/CITnet/confluence/display/EIA/EIA+Home
ISA website	http://ec.europa.eu/isa/index_en.htm
ISA FAQ	http://ec.europa.eu/isa/faq/faq_en.htm