European Commission

isa Interoperability Solutions for European Public Administrations

Webinar

e-Documents for public administrations

9 September 2014
ISA Programme Action 2.15

ISA

Webinar

Agenda

Time	Topic
14:00	**Welcome** – *Susanne Wigard, European Commission, ISA Programme*
14:10	**Round table** – *All participants*
14:20	**Survey on e-Document formats –** *Natacha Dewyngaert, Stijn Goedertier, PwC EU Services*
14:35	**Guidelines on e-Document engineering –** *Oriol Bausà Peris, Invinet*
14:50	**The e-Document model, semantics around e-Documents and semantic mapping** – *Muriel Foulonneau, e-SENS*
15:10	**e-Document security** - *Dusko Karaklajic, PwC EU Services*
15:20	**Feedback and questions**
15:50	**Closing**

European Commission

The ISA Programme undertakes actions to foster interoperability of information exchanges by public administrations across sectors and borders

Action 1.1 – Semantic interoperability
Action 1.6 – CIPA e-Delivery
Action 1.7 – e-Prior electronic procurement
Action 1.9 – e-Signature tools
Action 2.1 – European Interoperability Reference Architecture
Action 2.15 – e-Documents
...

Webinar

Objectives

1. Present the studies that have been carried out so far
2. Present the collaboration with e-SENS
3. Gather your input on future work in the area of e-Documents

e-Documents

Which solutions do public administrations *need*?

Design

- Formats
- Containers
- Headers
- Metadata
- ..

Create

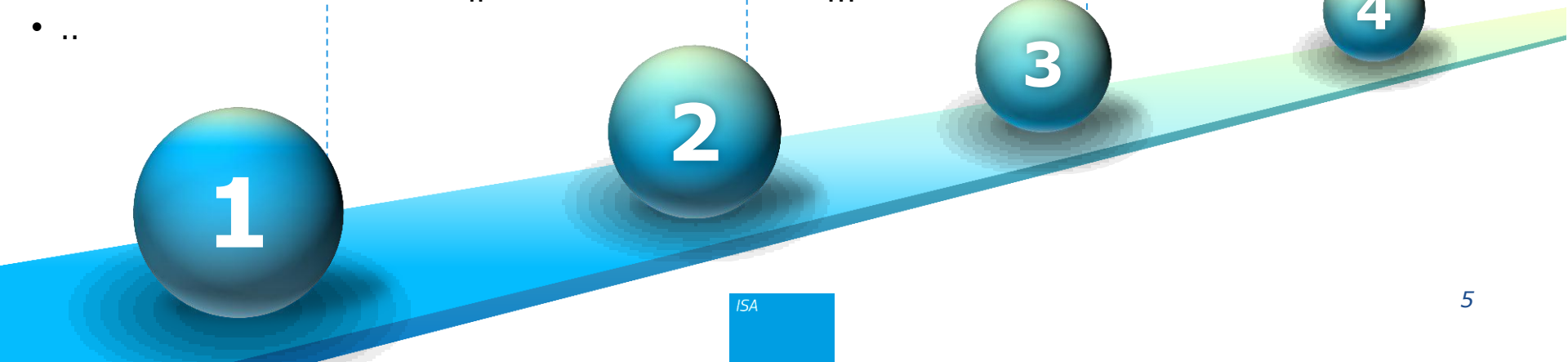
- Forms
- Apps
- APIs
- e-Signatures
- ..

Use

- Exchange
- Validation
- Search
- Representation
- …

Archive

- Long-term preservation
- Storage
- …



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Round table

What triggers your interest in e-Documents?

use the chat box and/or raise hand

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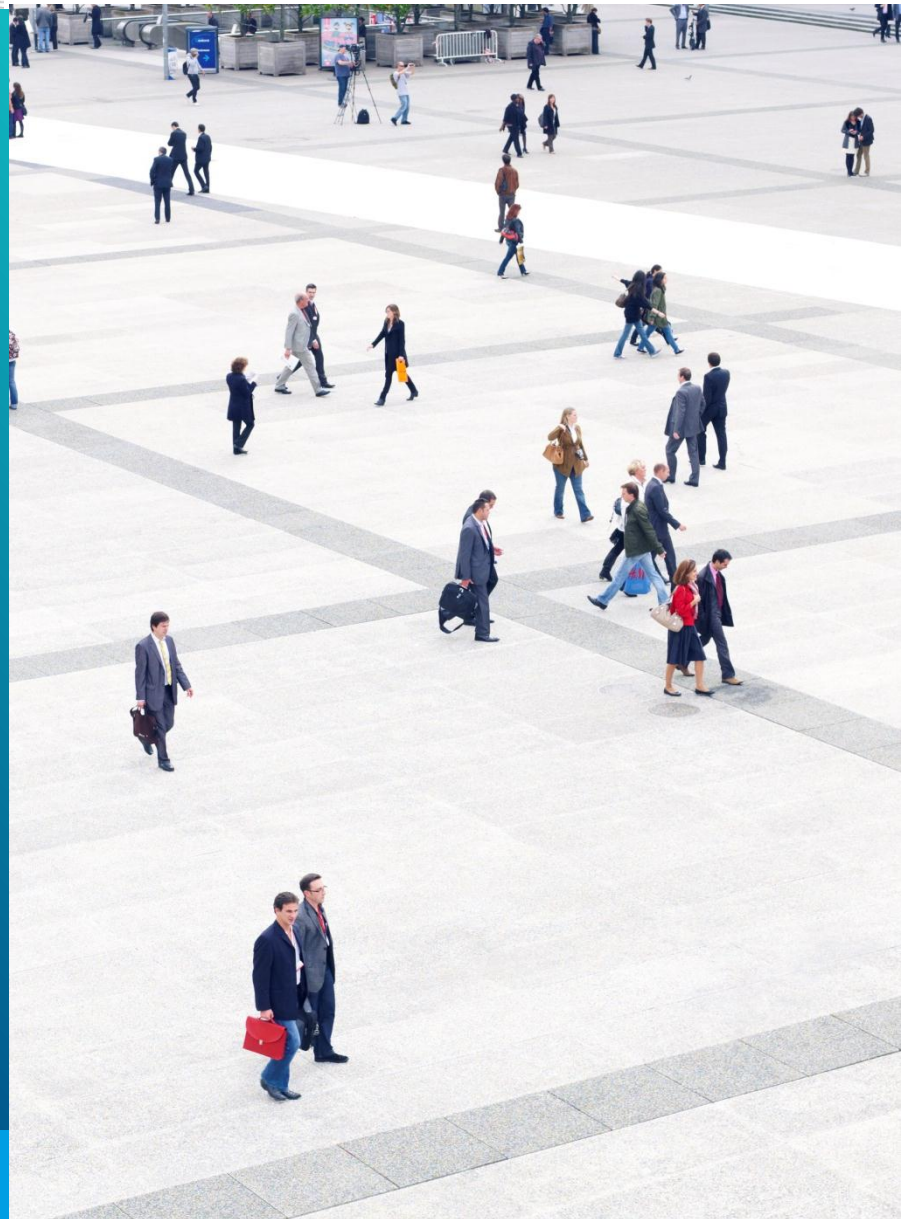
Survey on e-Document formats

Oriol Bausà Peris – Invinet
Natacha Dewyngaert – PwC EU Services
Dusko Karaklajic – PwC EU Services
Stijn Goedertier – PwC EU Services



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e-Document formats

- **Report** "Analysis of structured e-Document formats used in Trans-European Systems"

- This report presents the result of a study of twelve existing families of structured e-Document formats used for exchanging information between public administrations in Europe in connection to twelve so-called Trans-European Systems.

e-Documents

Definitions

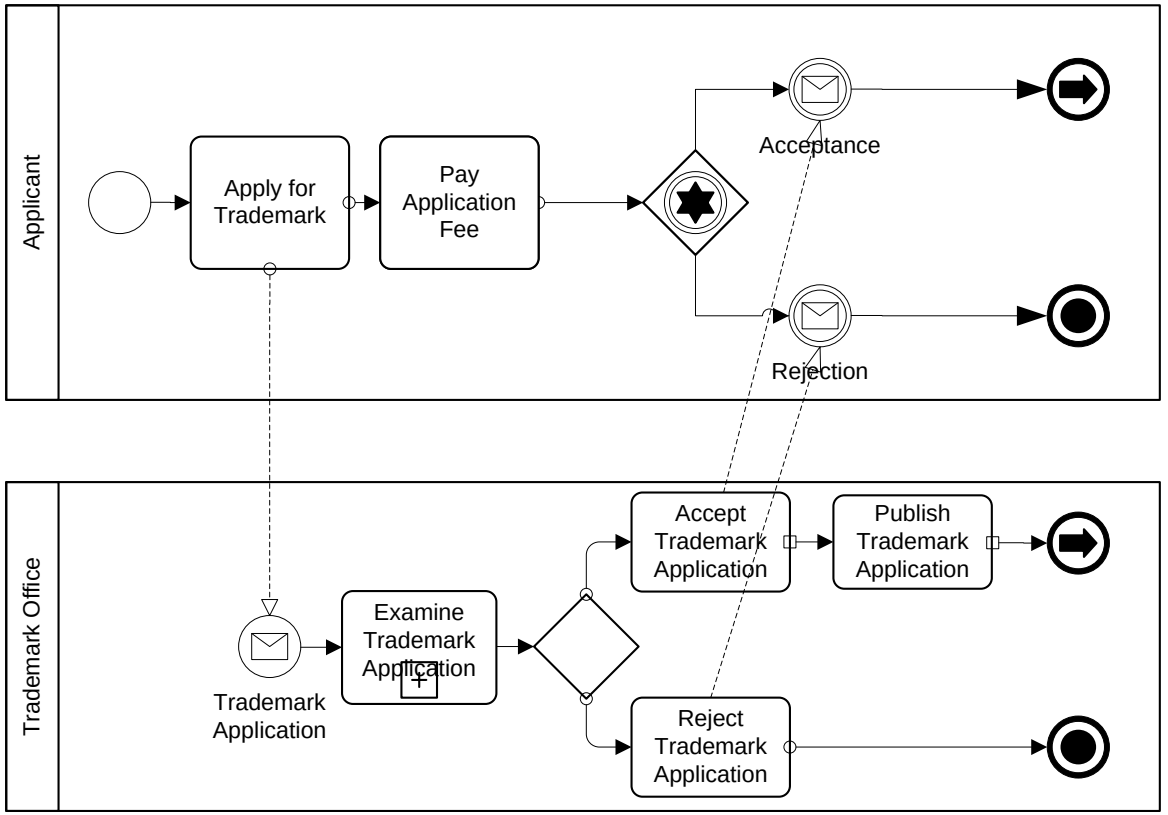
- **e-Document**: any document in electronic format containing structured data (and possibly also unstructured data) used in the context of an administrative process.
- **e-Document format**: a specification that lays down the syntax (structure) and semantics of a particular type of e-Document.
- **Trans-European system**: Solutions developed by the European Commission or other bodies (in some cases co-funded by Member States), that facilitate cross-border exchange of information and delivery of electronic public services between Public Administrations in support to the implementation and advancement of EU policies.

Why use e-Documents?

Motivations

- **Coordinate administrative processes:** e-Document are used to exchange information between the actors in an administrative process. They signal a state change in the process. For example, a request for a criminal record.
- **Evidence**: e-Documents provide evidence (audit trail, chain of custody) that a particular action was performed (e.g. trade mark application) or certify the fulfilment of particular criteria (e.g. birth certificate, medical prescription).
- **Legal effect**: e-Documents often have a legal effect. For example, the submission of an invoice, the registration of a trademark, etc.

e-Documents support administrative processes

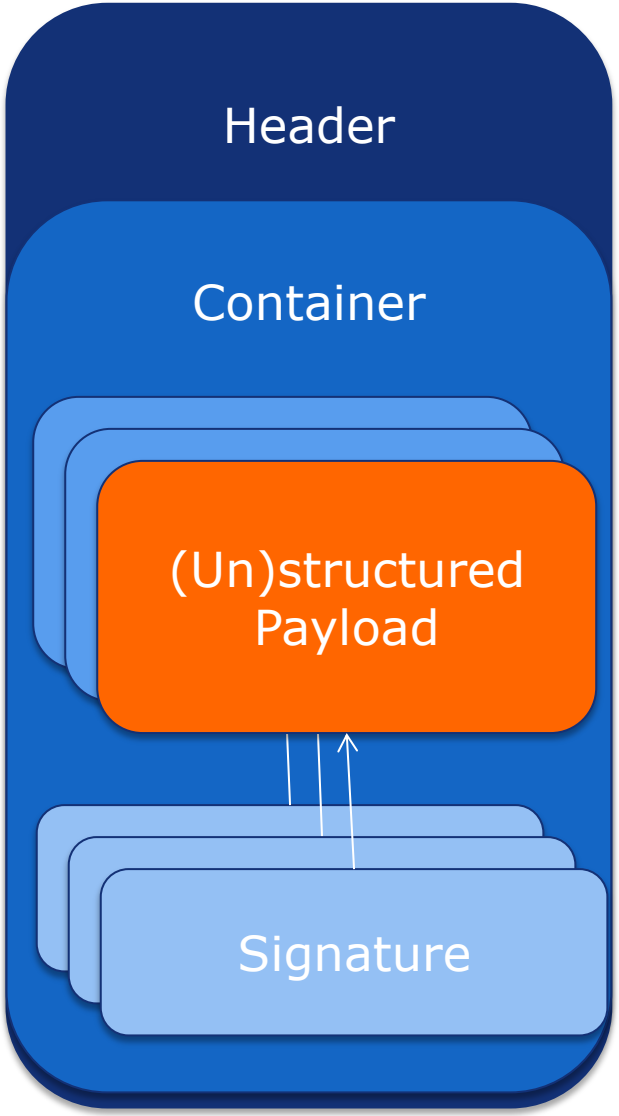


BPMN diagram: e-Documents used in a Trademark Application process

e-Documents

Structure

- e-SENS: towards a common e-Document model based on standards:
  - **Header**: Requirements for transmission, routing information.
  - **Container:** Packaging and bundling electronic documents
  - **Payload:** Structured or unstructured electronic documents packaged within a container.
  - **E-Signature**: Requirements for document integrity and authenticity of origin.
- The work of Action 2.15 has so far focused on **structured payload elements**.



Survey

12 families of e-Document formats

- **CEN/BII profiles used by e-Prior and PEPPOL**
- e-Document formats used by e-CODEX
- Electronic Exchange of Social Security Information (EESSI)
- **European Criminal Records Information System (ECRIS)**
- European Register of Road Transport Undertaking (ERRU)
- European Car and Driving Licence Information System (EUCARIS)
- Tachograph Network (TACHOnet)
- European Patients Smart open Services projects (epSOS)
- Eurofiling: financial reporting based on XBRL used by the European Banking Authority (EBA) and the European Insurance and Occupational Pensions Authority (EIOPA) and proposed by XBRL Europe
- Virtual Company Dossier (VCD) used by PEPPOL
- Omnifarious Container for e-Documents (OCD) used by SPOCS
- International Commission on Civil Status (ICCS)

Findings

Conclusion analysis case studies

- **e-Document engineering method**
  - Most cases use *standard* e-Document engineering methods (Oasis UBL, HL7 CDA, XBRL,…)
  - Half of the cases reuse *standard libraries of data elements* (Oasis UBL library, HL7 RIM, Core Vocabularies, CEFECT CCL, etc)
  - Uptake of standard *XML naming and design rules*
  - *XML and XSD* are the dominant schema representation techniques
- **Conformance**
  - *Application profiles* facilitate the use of e-Document formats in other information exchange contexts
  - *Conformance testing and certification* is important when on-boarding a large number of partners
  - Few e-Document formats come with a *reference implementation*

Findings

Conclusion analysis case studies

- **Security**
  - Most cases rely on *security features*, i.e. standard digital signature formats and document containers
- **Governance**
  - Most analysed e-Document formats have a *formal* governance mechanism
  - The *change management* process is not always *open*
  - All e-Document formats are stored in an *authoritative repository*
- **Usage**
  - e-Document formats are used in *high-volume administrative processes* (e.g. ECRIS processed >70K messages per month in 2013)

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e-Document engineering

Oriol Bausà Peris – Invinet
Natacha Dewyngaert – PwC EU Services
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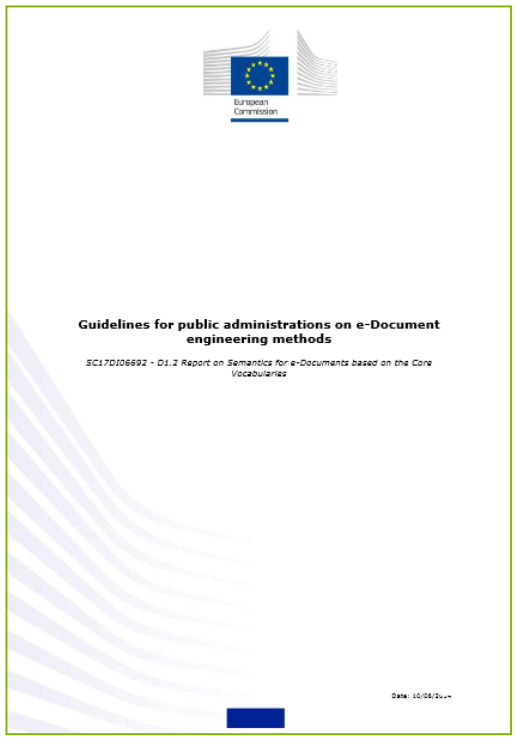
e-Document engineering



- Report: Recommendations for public administrations on e-Document engineering methods

- The report elicits **generic requirements** for e-Document engineering.
- **Assesses** to which extent standard e-Document engineering methods can be used by public administrations.
- Gives **recommendations** on e-Document engineering.

e-Document engineering methods

Definition

- **e-Document engineering method**: a method to create electronic documents to facilitate the interchange of information among heterogeneous systems.

- **Main components:**
  - **Methodology:** A methodology for capturing requirements and formalising the process model, data model, and business rules.
  - **Library of data elements**: A lexicon of data types and attributes that contain the elements that can be used in the e-Document.
  - **Naming and design rules**: A grammar that governs the composition of e-Documents, covering both the syntax and the semantics.

- **Tools**: Tools for information modelling, schema creation, and conformance testing.

e-Document engineering methods

Two approaches

- Two approaches to e-Document engineering:
  1. **Syntax binding:** create a guideline to *reuse* an *existing* e-Document format
  2. **Document format creation:** create a *new* e-Document format

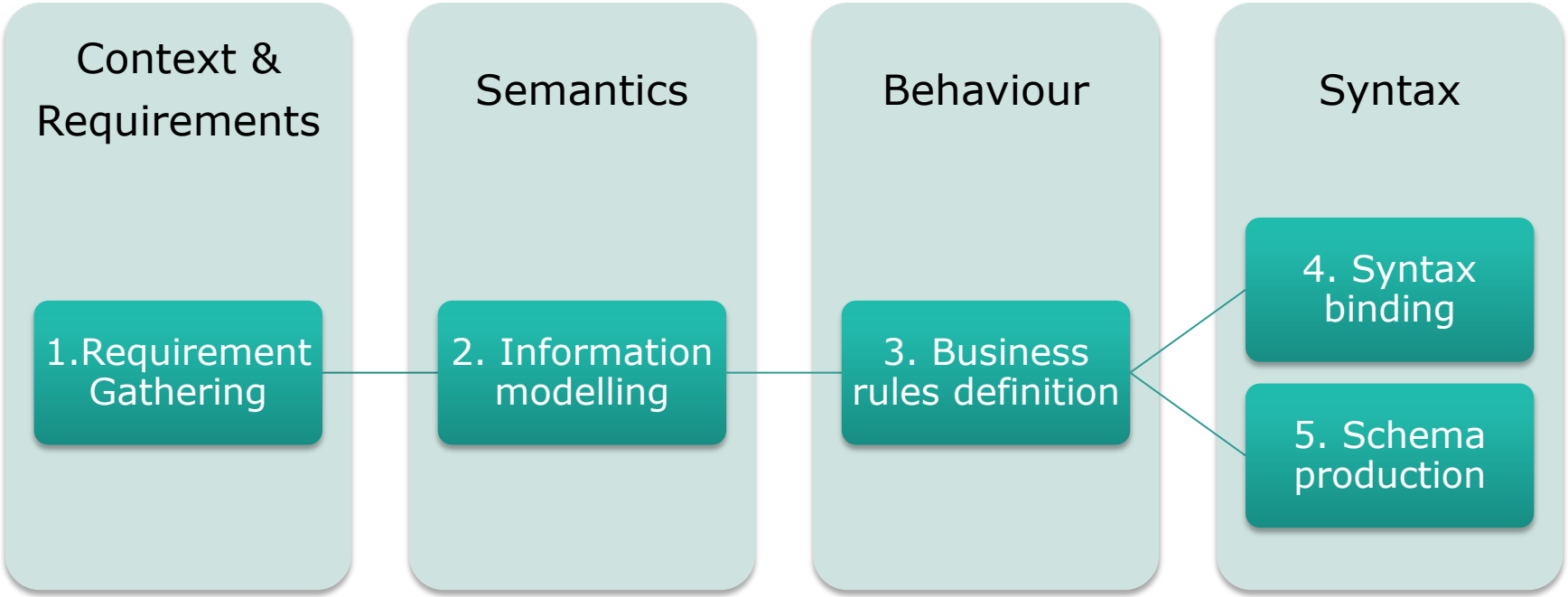
➔ Important to identify the requirements that the e-Documents must fulfil

Guidelines for public administrations on e-Document engineering methods

Approach to develop the guidelines

Generic blueprint of an e-Document engineering method

General requirements



Existing e-Document engineering methods

Assessment

Assessment of 3 commonly used standard e-Document engineering methods according to the criteria of the **Common Assessment Method of Standards and Specifications** (CAMSS):

- Schema production:
  - UN/CEFACT method
  - OASIS UBL method
- Syntax binding:
  - CEN BII method

CAMSS

- ★ Applicability
  eGov interoperability, re-use, compatibility,...
- ★ Maturity
  Development status, quality, stability, ...
- ★ Openness
  Creation and change process, availability, ...
- ★ IPR
  Documented, FRAND or royalty free.
- ★ Market support
  Implementations, users, ...
- ★ Potential
  Impact, risks, maintenance, ...
- ★ Coherence
  Correspondence with existing European standards, ...

Existing e-Document engineering methods

Overall CAMSS automated assessment score

Category	UN/CEFACT method	UBL method	CEN BII method	Assessment strength
Applicability	100%	100%	100%	88%
Maturity	86%	86%	67%	100%
Openness	100%	100%	89%	100%
Intellectual property rights	100%	100%	100%	100%
Market support	75%	100%	50%	80%
Potential	100%	100%	50%	62%
Coherence	50%	33%	25%	67%
Overall score:	**87%**	**88%**	**69%**	**85%**

No ranking is implied. Only an analysis of the detailed evidence for each assessment criterion allows making an informed comparison.

Automated Score [#Yes/(#Yes + #No)]
Assessment Strength [(#Yes + #No)/#Criteria per category]

Reusing the Core Vocabularies for e-Document engineering

Mini-pilot

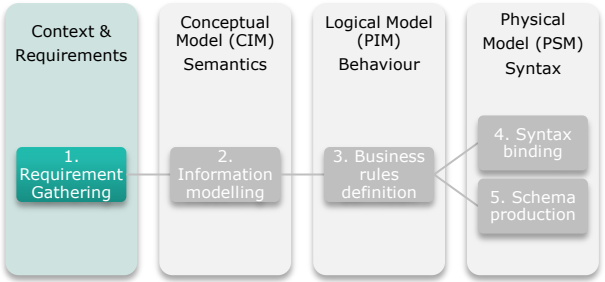
- The mini-pilot is based on a use case and more elaborate pilot proposed by e-SENS WP 5 '*Use Case 5.4 – Registering a new business activity*', which describes the activity registration of a business in a foreign Member State.

- **Objectives**:
  - Demonstrate the use of a standard e-Document engineering method to create e-Document formats
  - Demonstrate how a metadata registry, a *common library of data elements* and *mappings,* can help e-Document engineering

Reusing the Core Vocabularies for e-Document engineering

Mini-pilot

- Approach:
  - **Create e-Document** formats using a standard e-Document engineering method
    - CEN/BII e-Document engineering method
    - UBL NDR
  - **Create a metadata registry,** a library of data elements and mappings for some standard libraries
    - Describe libraries of data elements, create links between them
    - Describe requirements of e-Document formats, facilitate syntax binding or schema creation, and enrich XML Schema documentation

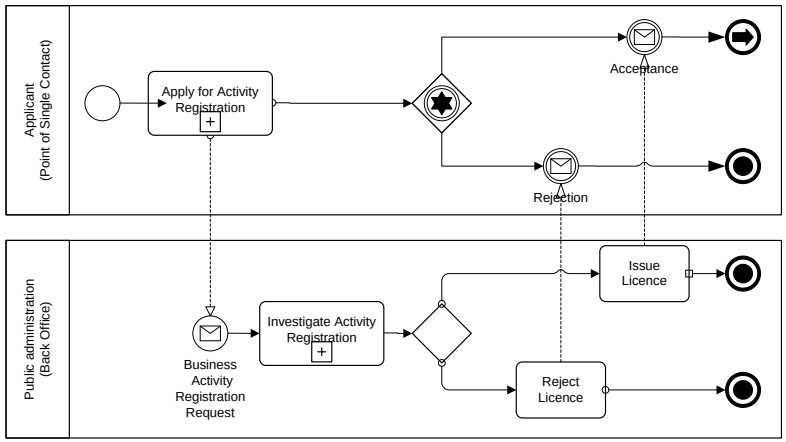


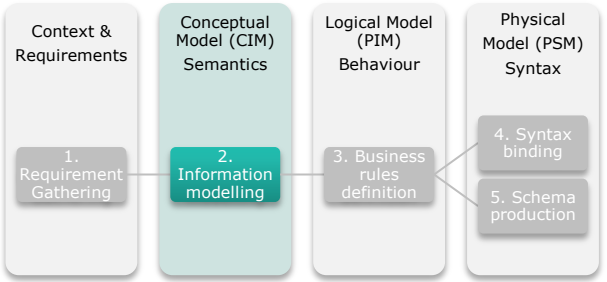
1. Requirement gathering

The first step is to precisely define the objective of the business process.

- **Goals**: describe specific goals to be achieved with the exchange of e-Documents
- **Scope:** describe the scope derived from the goals
- **Key examples:** describe key examples as real-life scenarios to depict the business process flow
- **Specific requirements:** gather specific requirements that e-Documents must fulfil linked to the goals

Activity registration





2. Information modelling

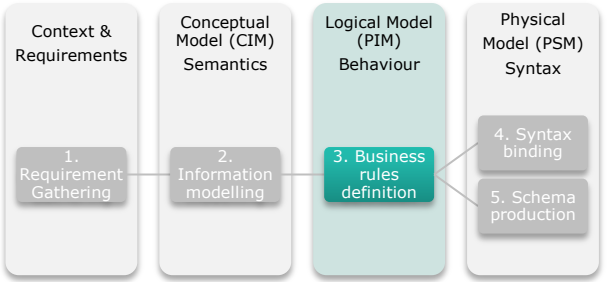
This phase identifies and describes the information to be exchanged in e-Documents according to the requirements specified in the first step.

- **Semantics** of every data element
- Describe the **relationships** between information components and requirements
- Identify and reuse semantics and concepts from **standard vocabularies** where possible

List of business terms

IR ID	IR 4	IR 5	IR
Business Term Name	Business Activity	Business Name	Business
Usage	Activity performed by the legal entity, which is requested for registration	Name of the legal entity that is requesting the business activity registration	Type of th entity that requesting business a registratio
Refer to Business Require-ment ID	R3	R1	
Refer to Business Rule ID	BR1		B
Cardinality	1..1	1..1	1
Concept location	Registered Organization Vocabulary	Registered Organization Vocabulary	Registered Organizati Vocabular
Standard Concept	Organization Activity	Legal Name	Organizati

3. Business rules definition

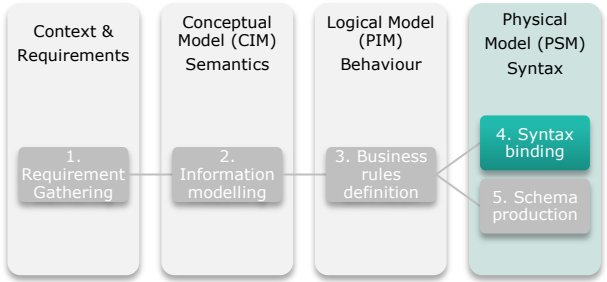


Describe assertions, constraints and derivations concerning some aspects of the e-Document. These business rules are described according to the goals and requirements of the first step.

- Identify **integrity constraints** and describe them as business rules linking to the requirements
- Define **inferences** and **mathematical calculations**
- Define **conditional** business rules and **co-occurrence constraints**
- Define **sets of allowed values** for coded data elements

Business rule list

Business Rule ID	Rule	Refer to Information Requirements	Refe Leve Requ
BR1	The business activity must refer to a NACE activity	IR4	
BR2	The legal form of the business must be recognized by the business' country of origin	IR6	

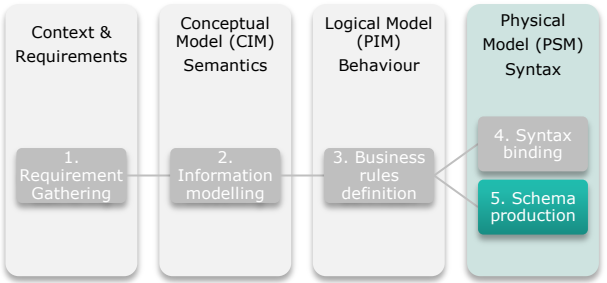


4. Syntax binding (reuse)

Syntax binding is one of the options to produce physical artefacts in order to help developers implement the e-Documents according to the e-Document format rules.
With syntax binding, the information requirement model is mapped to an existing syntax model and the usage guidelines are specified.

- Map the information model to a **standard syntax** when this syntax fulfils most of the goals and requirements of the project
- Create a **usage guideline** on the syntax for implementers
- Create **validation artefacts** for business rules and code lists
- **List minor gaps** and/or requirements that cannot be fulfilled using the selected syntax

Not used in the mini-pilot

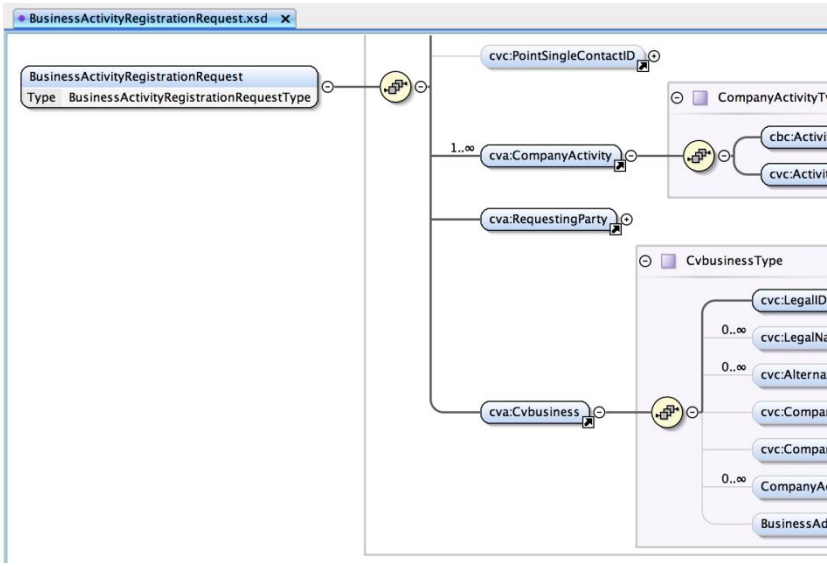


5. Schema production (partial reuse)

The second option is to produce a new e-Document format. This option should be followed when there are no recognized international standards for the industry and business process the project is targeting.

- Use **Common Vocabulary** schemas (e.g. ISA Core Vocabularies, UBL common library, UN/CEFACT Core Components Library)
- Create new e-Document formats using a **standard NDR** to automate the schema production
- Create **validation artefacts** for business rules and code lists

XSD Schema



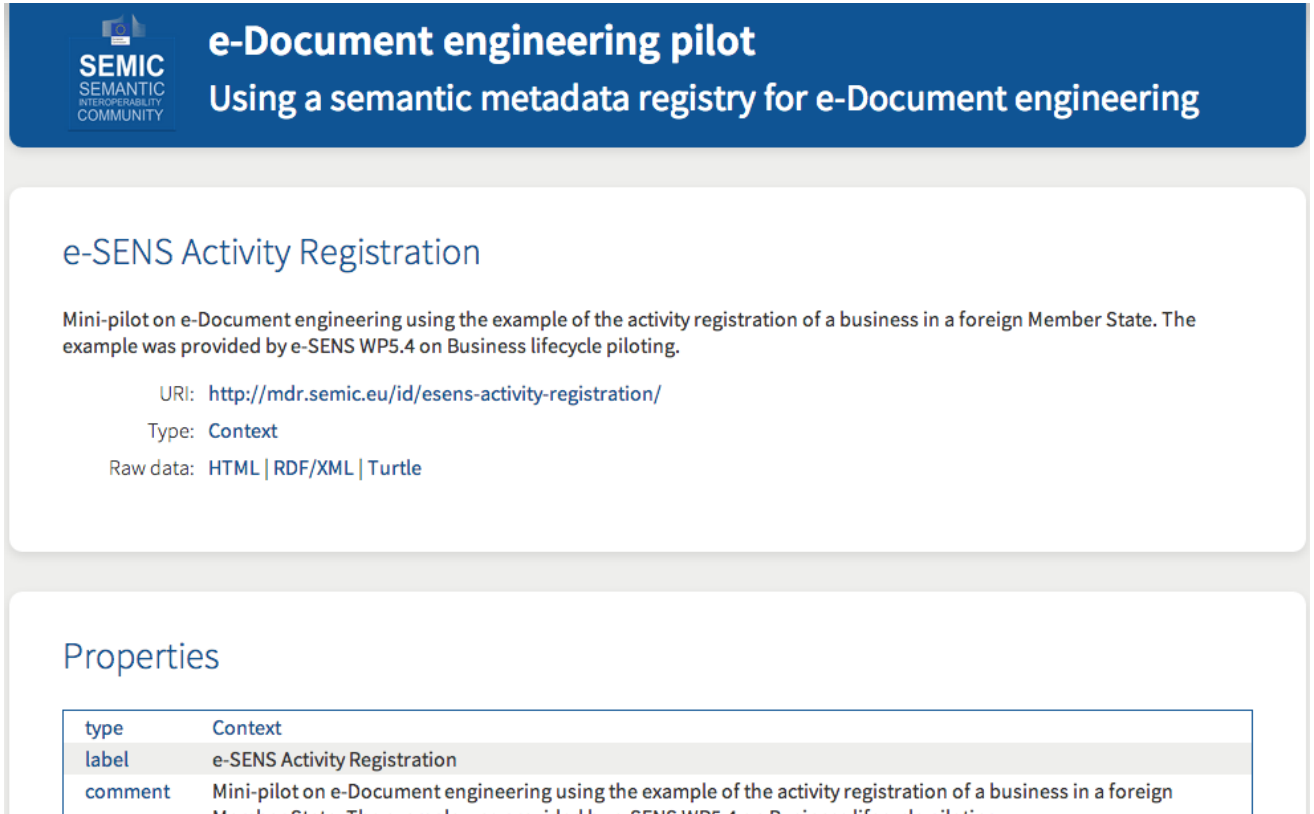
Using a metadata registry to support e-Document engineering

- Manage libraries of data elements
  - **Register data elements in standard libraries** in a central point of access.
  - **Create links between classes and properties**, providing insight into the similarities and differences between libraries.
  - **Search for data elements**, explore the use of classes and properties in different contexts, facilitating their reuse in similar contexts.

- Support of e-Document engineering
  - **Register requirements**, information model, and business rules in the context of an e-Document specification and create links between them.
  - **Facilitate syntax binding / schema creation**. By combining data element libraries and e-Document requirements in a central place, all information needed to reuse or produce schemas are readily available.
  - **Enrich XML Schema documentation** of e-Document formats.

Metadata registry pilot

- Available on-line: http://mdr.semic.eu/doc/esens-activity-registration/



Recommendations on e-Document engineering methods

1. Select a **standard** e-Document engineering method
   - Lower risk and cost, facilitate maintenance.
2. Use **standard** libraries such as the ISA Core Vocabularies
   - Increase interoperability, ease development and deployment.
3. Make e-Document formats available for **reuse**
   - Increase cross-sector and cross-domain interoperability.
4. Follow **good practices** for metadata governance and management
   - Ensure stability and long term sustainability of the e-Document formats.
5. Explore the feasibility of operating a **federated metadata registry**
   - Increase reuse and discoverability.
6. Use **existing tools**
   - Reduce cost and risks.

Tutorial: Crane Software GC-to- UBL NDR script

Tutorial: on the use of Crane's Genericode-to-UBL-NDR to extend the Core Vocabularies and create e-Document formats

This tutorial explains how to create an electronic Document in XSD format using the Genericode to UBL NDR tool of Cranesoftwrights. We have used the tool to create a sample document called 'Business Activity Registration Request' using the ISA Core Vocabularies and the UBL Naming and Design Rules.

The Genericode to UBL NDR is an open-source package provided by Crane Softwrights available under the Modified BSD Licence. This package allows creating UBL 2.1 XSD Schemas and OASIS CVA (context/value association) files according to the UBL Naming and Design Rules. In 2012, the script was already used to produce the original XSD Schemas of the ISA Core Vocabularies. The input for the package is a UBL NDR 2.1

Source: https://joinup.ec.europa.eu/node/78939

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e-SENS
Electronic Simple European Networked Services

The e-Document model, semantics around e-Documents and semantic mapping

The Digital Agenda for Europe

SENS | moving services forward.eu

"Too many barriers still block the free flow of online services and entertainment across national borders. "

Large scale pilots

SENS moving services forward.eu

‘The "Large Scale Pilot" projects (LSPs) develop practical solutions tested in real government service cases across Europe.
‘

SPOCS “Simple Procedures Online for Cross-border Services”

epSOS “European Patients Smart Open Services”

STORK “Secure idenTity acrOss boRders linKed”

PEPPOL “Pan European Public Procurement OnLine

e-CODEX “e-Justice Communication via Online Data EXchange”

STORK 2.0 making access smarter.eu

e-CODEX making justice faster.eu

epsos EUROPEAN PATIENTS SMART OPEN SERVICES making healthcare better.eu

PEPPOL PAN-EUROPEAN PUBLIC PROCUREMENT ONLINE making procurement better.eu

SPOCS making business easier.eu

Goal

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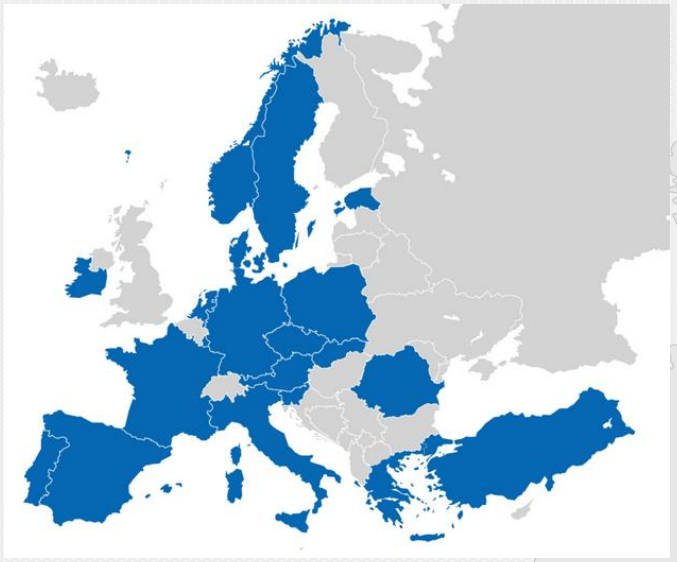
to improve the cross-border access of citizens and businesses to public services in Europe

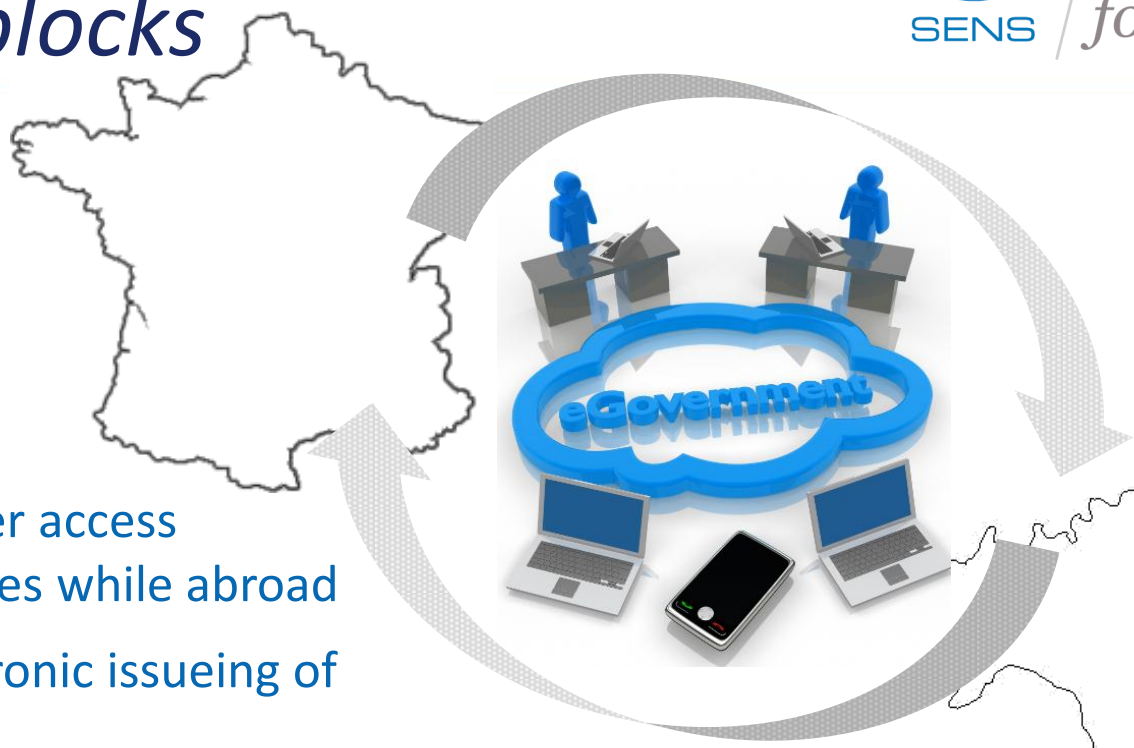
by provision of interoperable IT solutions



Public administration, agencies, companies from 20 countries

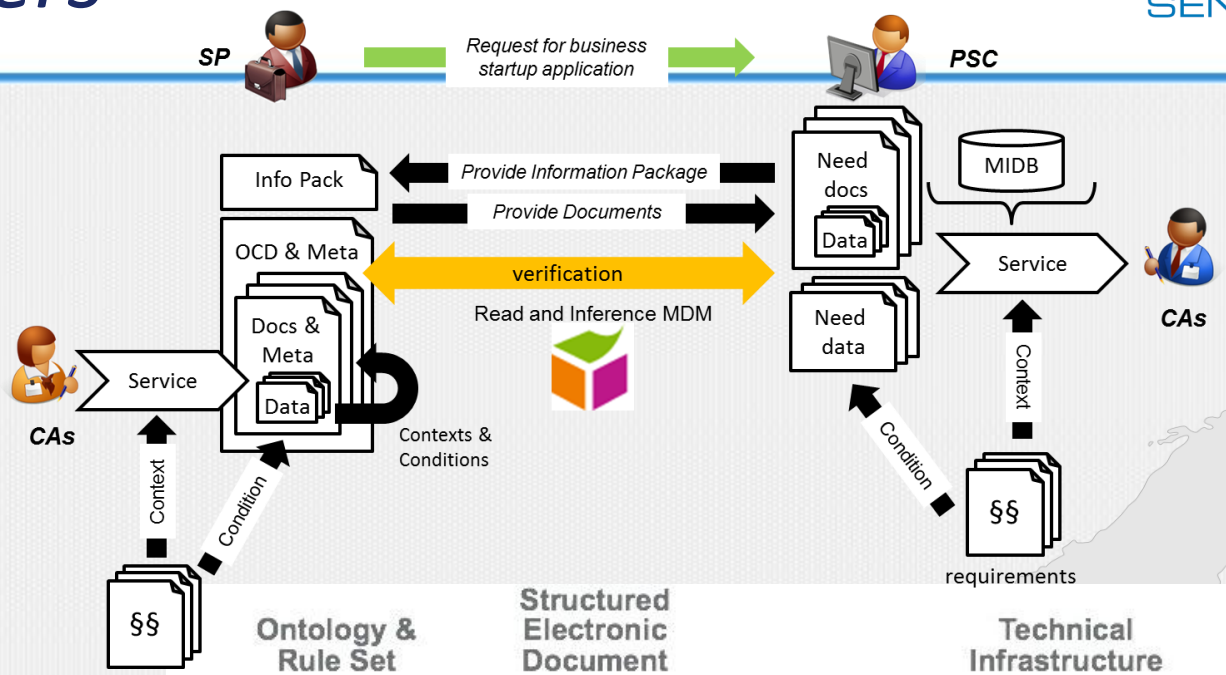
eSens to consolidate and share building blocks

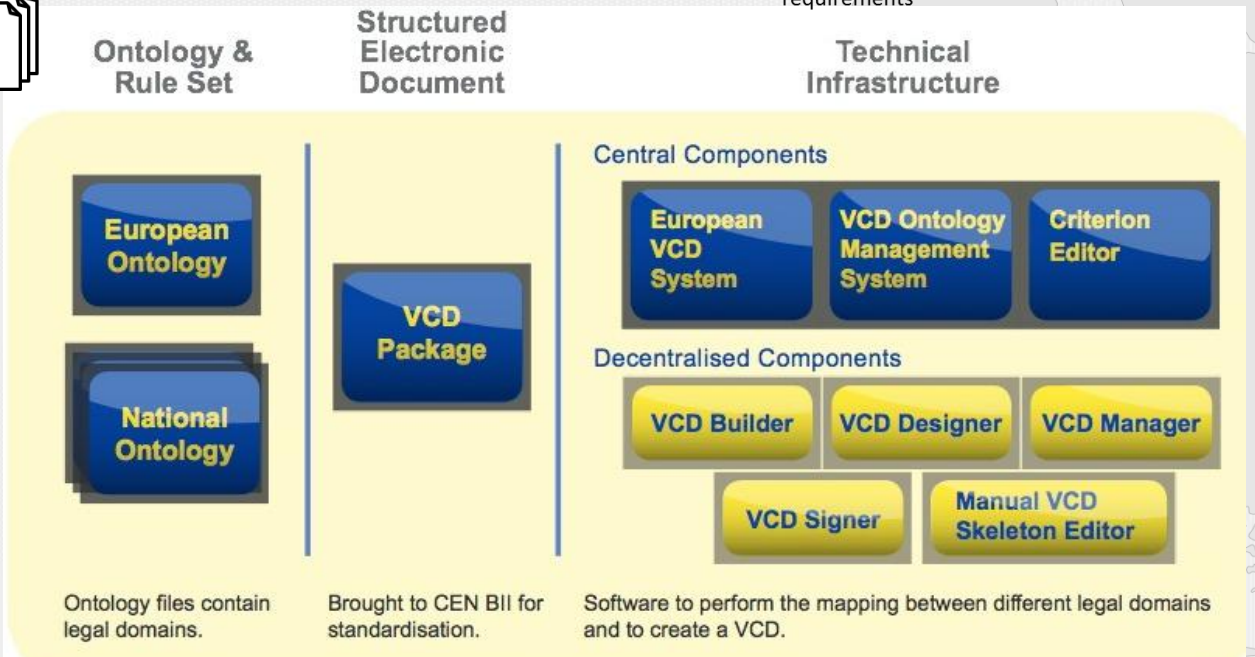
SENS moving services forward.eu



- e-health – easier access to health services while abroad
- e-justice – electronic issueing of a claim in a foreign court
- e-procurement – electronic bidding in other EU countries
- business lifecycle – online completion of formalities for company setup abroad

Transferring documents across borders





eDocument Architecture OCD / VCD

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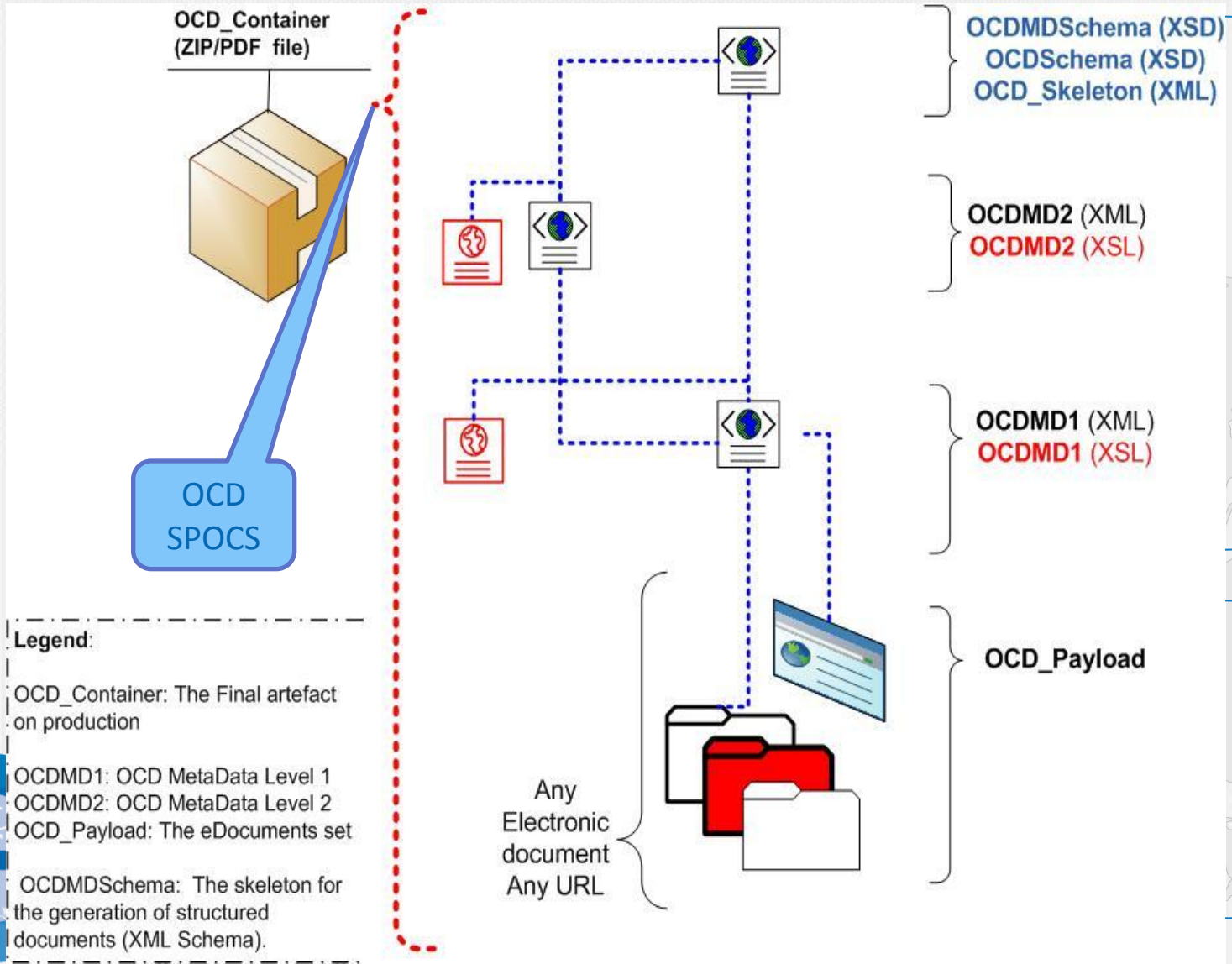

ebMS Header eCODEX

VCD Package PEPPOL

Procedure payload eCODEX

VCD1, VCD2.. Payload PEPPOL

Towards a common eDocument model based on standards

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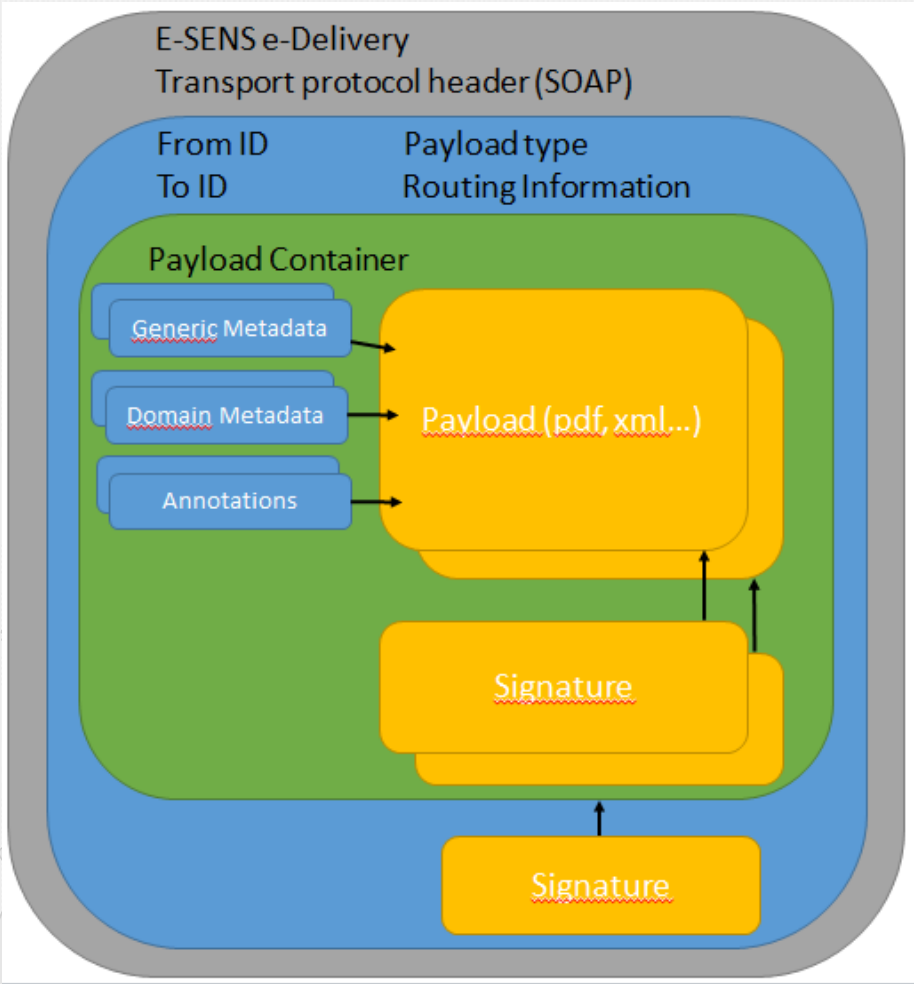
- The container file may include:
  - One or more (encrypted) file document(s)
  - Generic and profile metadata
  - Attached electronic signature
  - Annotations



eDocuments are supported by eSens building blocks

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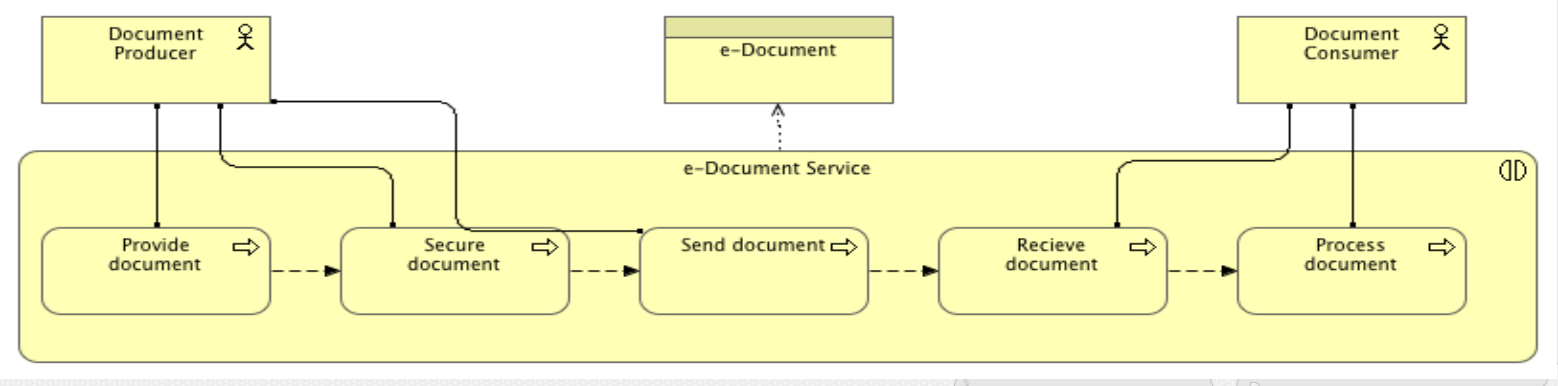
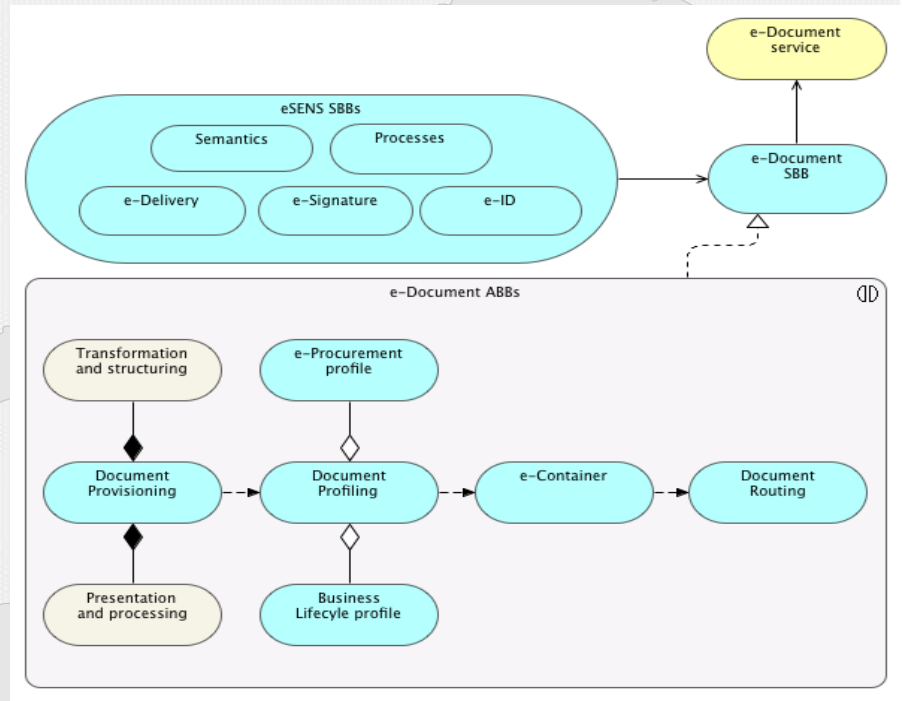
The eDocuments High level building block

- "An **e-Document** is any electronic document, structured or unstructured, which supports various formats and it is offering functionality that fulfils a set of generic, domain or use case specific requirements."



eDocument building block

- Architectural building blocks
  - **e-Document provisioning ABB**
  - **e-Container ABB**
  - **e-Document routing ABB**
  - **e- Document profiling ABB**
- Solution Building Blocks



Metadata for eDocuments

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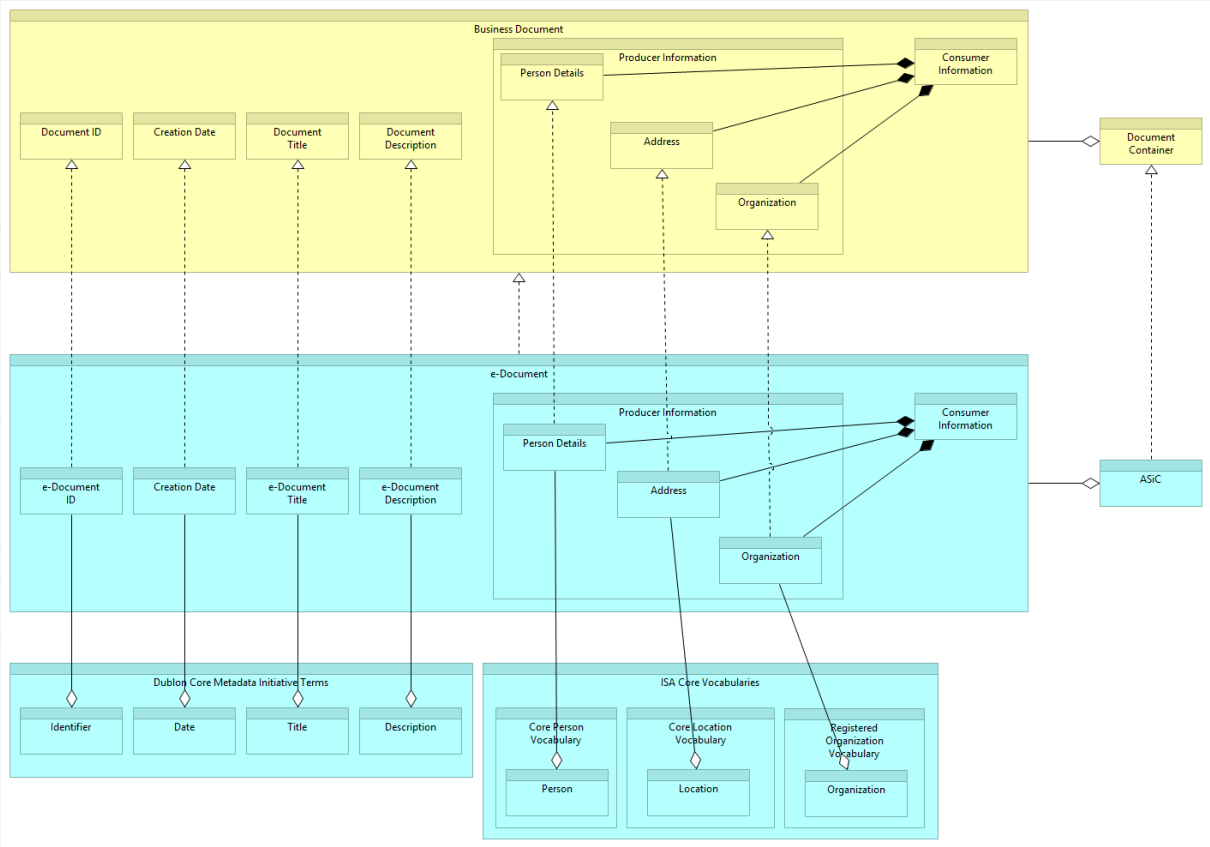
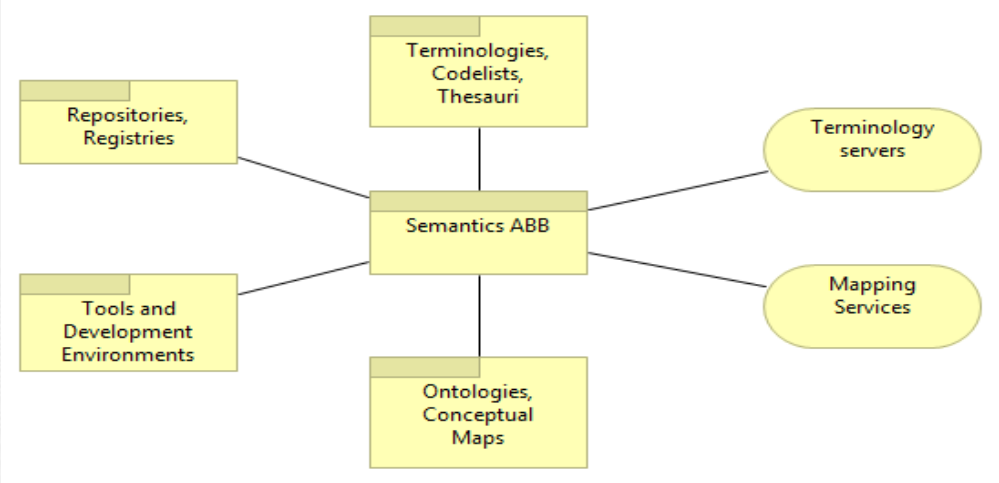
- Dublin Core Metadata Initiative, ISA Core vocabularies, (W3C Open Annotation Data Model)



eSENS Semantics

Semantics High level Building Blocks



- **Mapping Services ABB**
- **Terminology server ABB**
- **Ontologies Management ABB**

eDocuments to support cross-border eGovernment services

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- Common framework
- Common tools
- Common methods
- Domain specific formats

  - extensible framework for new domains
  - based on widely accepted standards

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Thank you!

e-SENS is an EU co-funded project under the ICT PSP

Webinar

Agenda

Time	Topic
14:00	**Welcome** – *Susanne Wigard, European Commission, ISA Programme*
14:10	**Round table** – *All participants*
14:20	**Survey on e-Document formats –** *Natacha Dewyngaert, Stijn Goedertier, PwC EU Services*
14:35	**Guidelines on e-Document engineering –** *Oriol Bausà Peris, Invinet*
14:50	**The e-Document model, semantics around e-Documents and semantic mapping** – *Muriel Foulonneau, e-SENS*
15:10	**e-Document security** - *Dusko Karaklajic, PwC EU Services*
15:20	**Feedback and questions**
15:50	**Closing**

European Commission

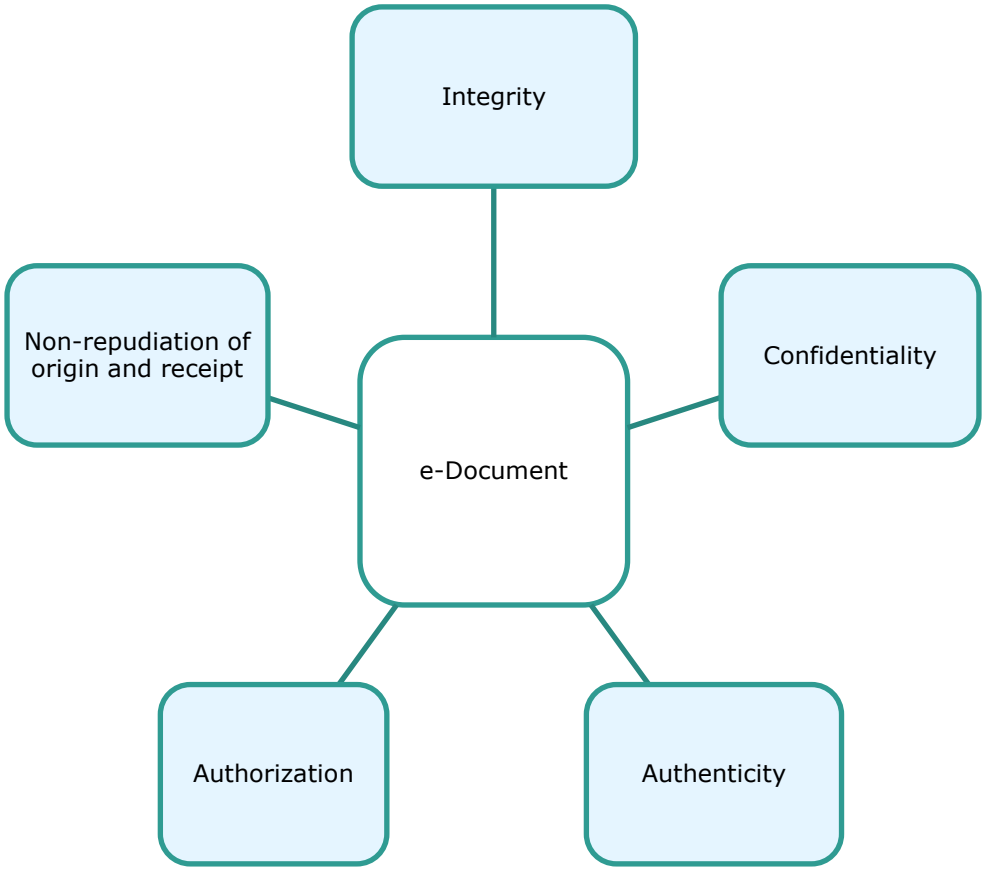
isa Interoperability Solutions for European Public Administrations

e-Document security

Oriol Bausà Peris – Invinet
Stijn Goedertier – PwC EU Services
Dusko Karaklajic – PwC EU Services
Natacha Dewyngaert – PwC EU Services

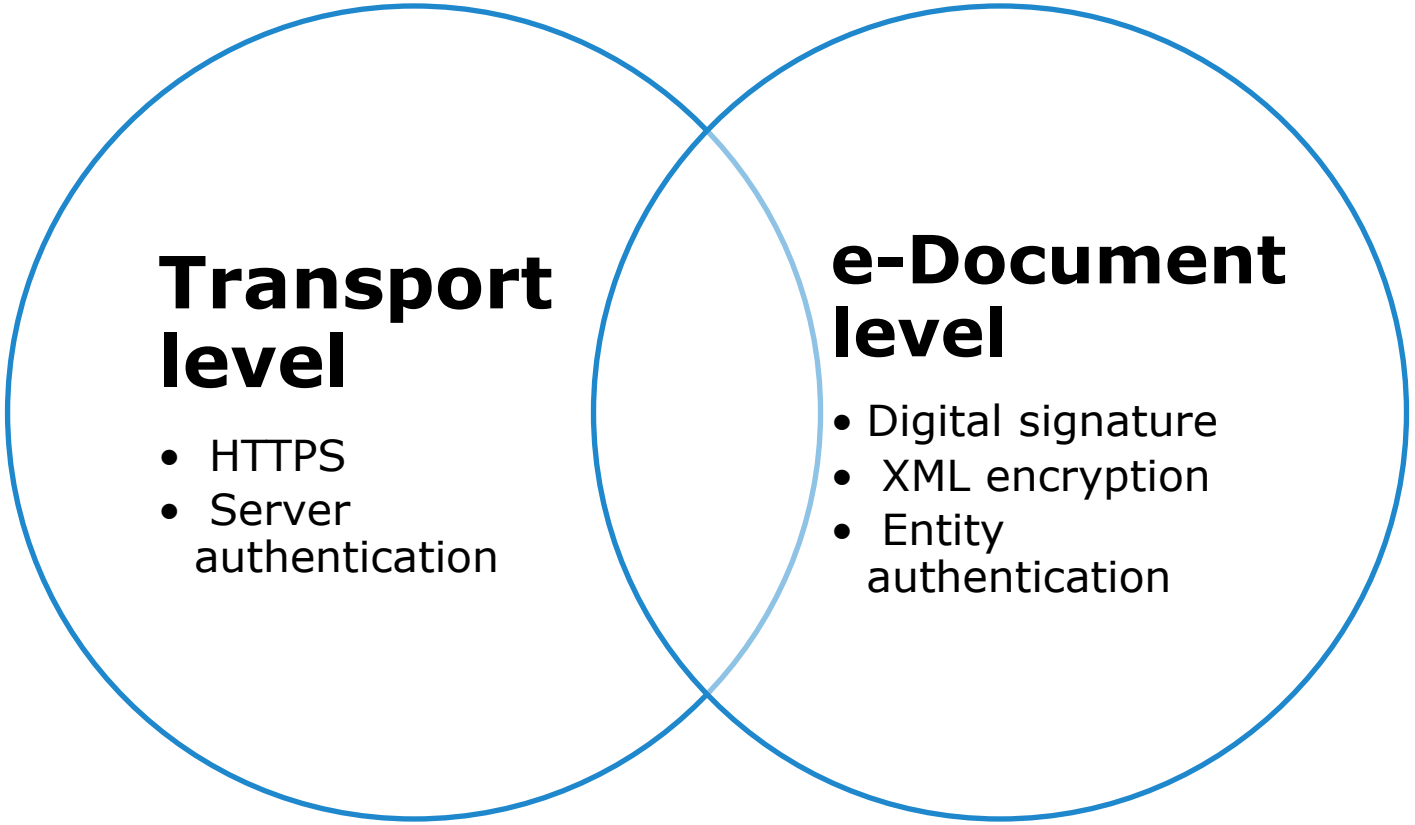
ISA

What is e-Document security?



e-Document security

Survey findings- application of security measures

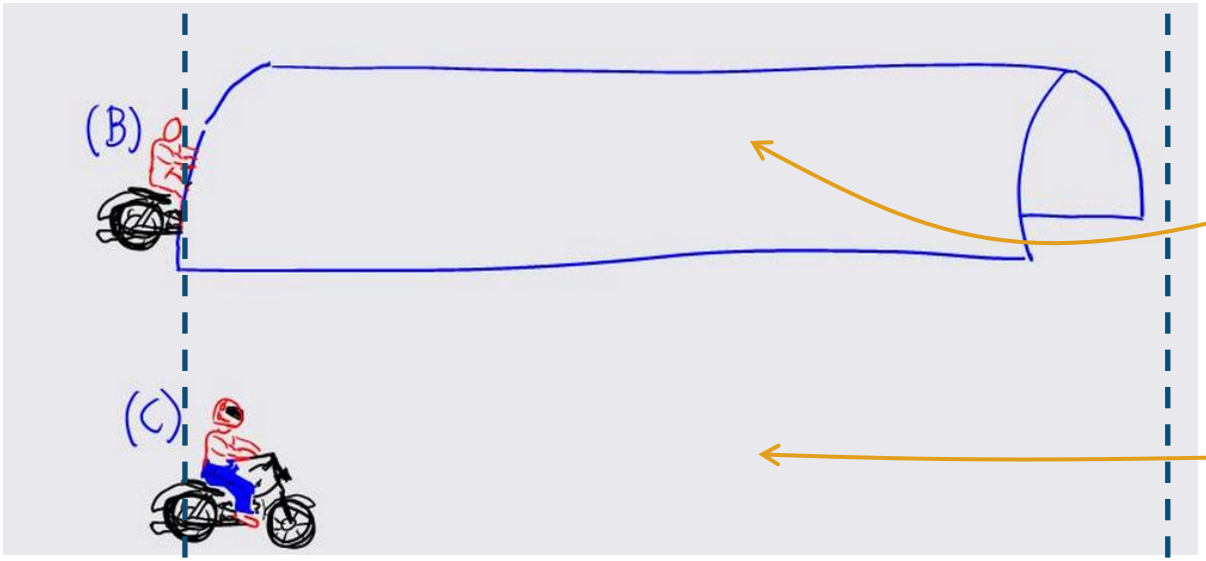


Transport vs Document level security

Sender

Network

Receiver



Security on transport level

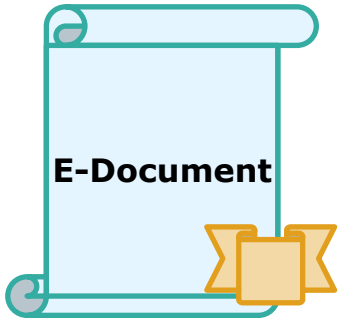
Security e-document level

Transport vs Document level security

Sender

Network

Receiver

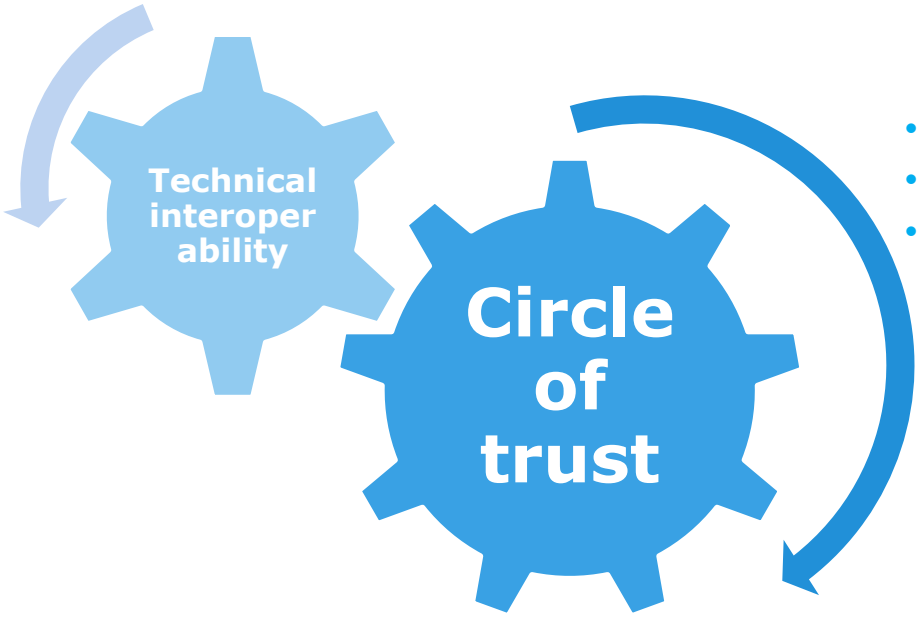


- **Preserving security**
  - Storage
  - Further distribution

e-Document security

Survey findings- interoperability aspects

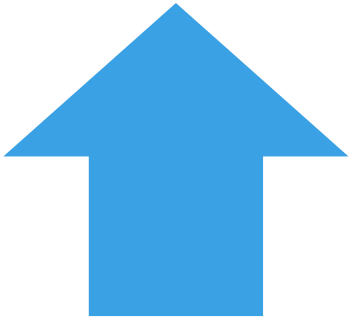
- Common signature formats
- Encryption standards
- Federated approach



- Common security policy
- Legislation
- Supervision and audit

e-Document security

Security vs. interoperability



Security level

- Interoperability
- Cost
- Usability

e-Document security

Guidelines

- Apply **proportional** security
- Use **standard solutions** for security mechanisms
  - *E.g.* XAdES/PAdES for digital signatures
  - XML encryption
- Leverage on the policy frameworks to **build trusted relationships** between system actors - eIDAS regulation
- Reuse the **existing building blocks/tools**
  - *E.g.* DSS Tool from DG MARKT
- Apply security across the entire e-Document lifecycle

Webinar

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e-Documents

Which solutions do public administrations *need*?

Design

- Formats
- Containers
- Headers
- Metadata
- ..

Create

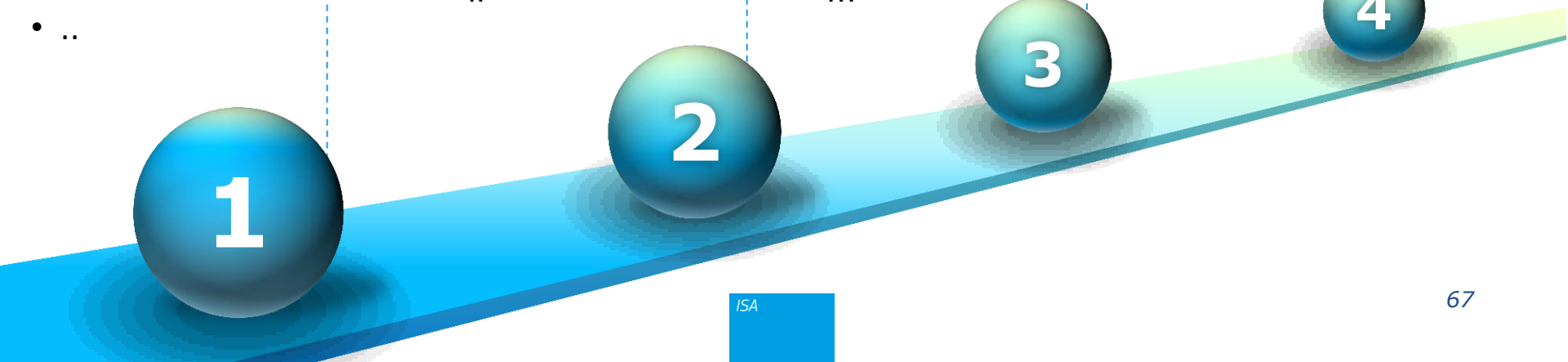
- Forms
- Apps
- APIs
- e-Signatures
- ..

Use

- Exchange
- Validation
- Search
- Representation
- …

Archive

- Long-term preservation
- Storage
- …



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ISA Programme Action 2.15 – e-Documents

Project Officers

Suzanne.Wigard@ec.europa.eu

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DCAT APPLICATION PROFILE FOR EUROPEAN DATA PORTALS

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eGOVERNMENT CORE VOCABULARIES

CORE PUBLIC SERVICE VOCABULARY

CORE LOCATION VOCABULARY

CORE PERSON VOCABULARY

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