European Commission

On-site workshop

eInvoicing Implementation Workshop

26 September 2017

Cyprus

#ConnectingEurope

Today's speakers

Christian Rasmussen

Christian is an experienced eProcurement Expert specialized in the execution of large scale ICT projects with past experience from the Nordic region including Denmark, Norway and Sweden. Christian has also been involved in the past EU-funded large scale pilots PEPPOL.eu and eSENS.eu as Work packager leader including focus on new eProcurement and eDelivery development.

Martin Forsberg

Martin Forsberg works as an expert in the area of electronic business, customs and financial processes. Martin was involved in the PEPPOL and eSENS Large Scale Pilots. He is active in standardization committees such as CEN TC434 and OASIS UBL.

Agenda

13 00	Welcome & Introduction	Christian Rasmussen, DIGIT D3 Irena Riviere-Osipov, GROW
13 05	CEF eInvoicing and our services	Christian Rasmussen, DIGIT D3
13 15	The European standard, XML syntax and validation	
14 30	Coffee break	
14 45	UBL / CII & Conversion issues	Martin Forsberg, DIGIT D3
15 00	Infrastructure (eDelivery) in coherence with CEF eInvoicing	Christian Rasmussen, DIGIT D3 Martin Forsberg, DIGIT D3
15 30	Funding & Grants for CEF eInvoicing	Christian Rasmussen, DIGIT D3
15 45	Discussion	All
16 00	Close	

Highlights of the workshop

DURING

Ask questions

Download other presentations at CEF Digital

AFTER

Download our other webinar recordings

Interact with our online community

Objectives of this workshop

Participants will learn about:

- CEF eInvoicing and our services
- The **European norm** and the **Directive 2014/55/EU** on electronic invoicing in public procurement
- Presentation of the European norm and related **specifications**
- **Validation**
- The **XML formats** used with the European standard
- **Infrastructure** components in coherence with **CEF eInvoicing**

Audience for this workshop

- Public authorities
- Private entities
- Policy makers
- Members of standardisation bodies
- eInvoicing implementers for:
  - Software services
  - Solution providers

CEF eInvoicing – Our services and how to get started

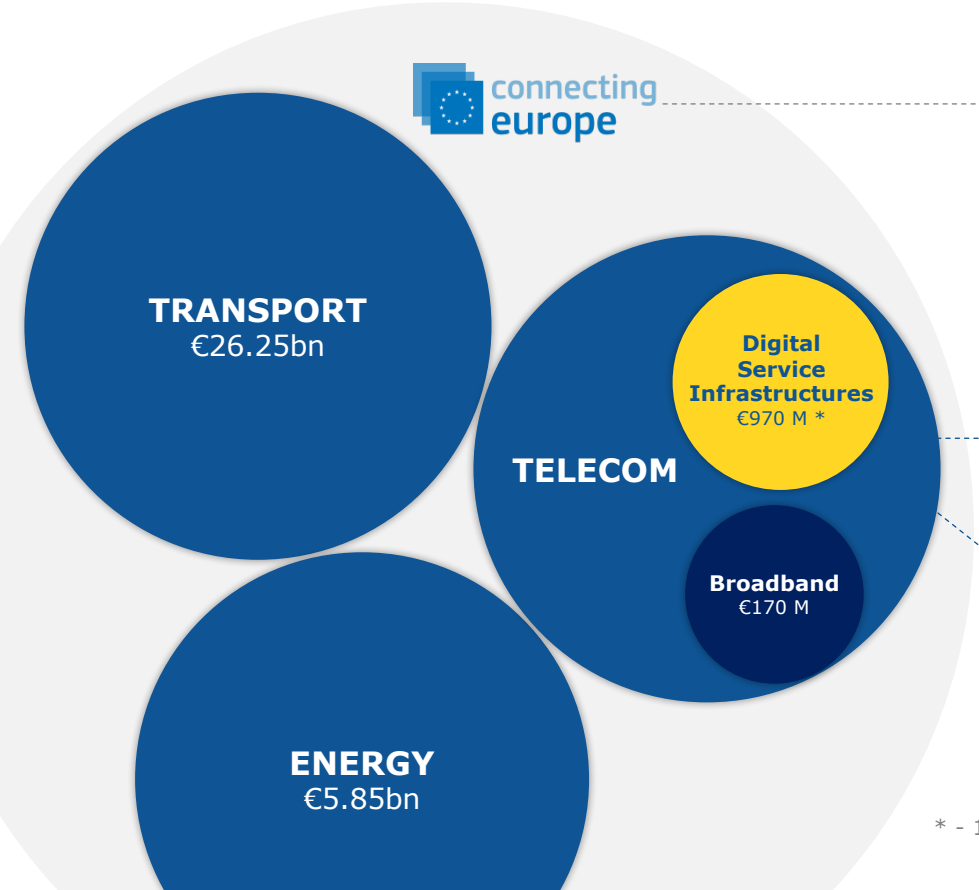
Christian Vindinge Rasmussen

DIGIT

1

What is CEF eInvoicing

What is CEF?



HOW IS IT REGULATED?

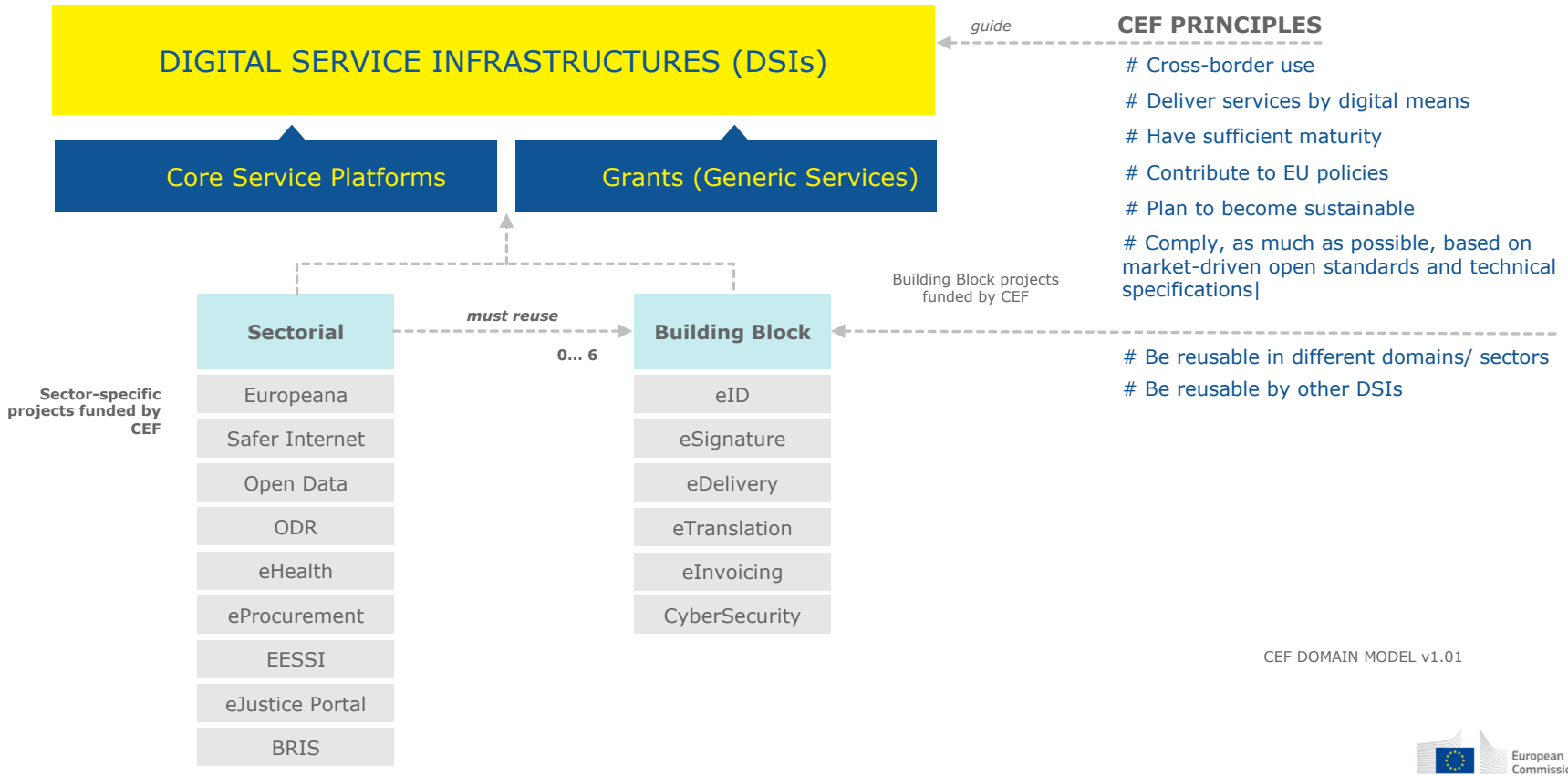
CEF Regulation
The Connecting Europe Facility (CEF) is a regulation that defines how the Commission can finance support for the establishment of trans-European networks to reinforce an interconnected Europe.

CEF Telecom Guidelines
The CEF Telecom guidelines cover the specific objectives and priorities as well as eligibility criteria for funding of broadband networks and Digital Service Infrastructures (DSIs).

CEF Work Programmes
Translates the CEF Telecom Guidelines in general objectives and actions planned on a yearly basis.

* - 100 M Juncker Package

What are Digital Service Infrastructures?



CEF DOMAIN MODEL v1.01

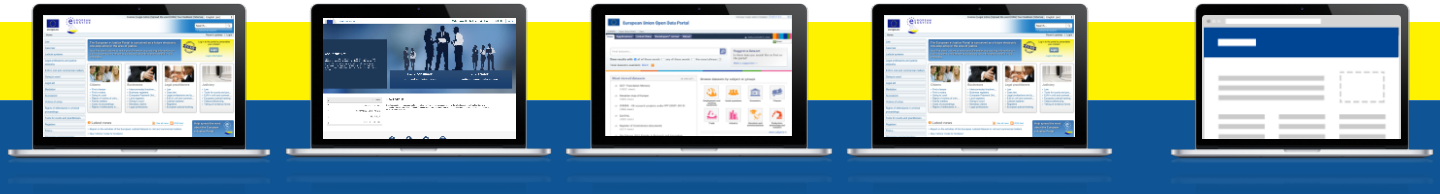
(*) A Building Block is a package of technical specifications, services and sample software that can be reused in different policy domains:

The 'Big Picture'

Funding for the
EUROPEAN COMMISSION

CORE SERVICE PLATFORMS

Services offered by the European Commission



eJustice | ODR | Open Data | BRIS | EESSI, etc.

IDENTIFY *with* eID

SIGN *with* eSignature

INVOICE *with* eInvoicing

EXCHANGE *with* eDelivery

TRANSLATE *with* eTranslation

Funding for the
MEMBER STATES

GRANTS

Projects in the Member States

Typically 'deployment' projects at national level (up to 75% of eligible cost)

What is CEF eInvoicing?

- CEF eInvoicing was introduced to support the Directive 2014/55/EU on electronic public procurement and the European standard for eInvoicing

- On 16th April 2014 the Directive was approved in the European Parliament and Council to set up one single pan-European standard for eInvoicing

- The Directive was a direct consequence of the many standards for eInvoicing across European and as successor of the PEPPOL project initial work on eInvoicing.

- The standard and definition is maintained by CEN, but the European Commission will assist through its CEF work programmes – more on this later…

2

Background and history of CEF eInvoicing

Background and history of CEF eInvoicing – PEPPOL.eu

- In 2008 the PEPPOL project was initiated on the best practices within mandatory eInvoicing for public administrations in the Nordic countries
- During the PEPPOL project a good number of the approximately 500 different eInvoicing platforms in Europe was connected through a single infrastructure and with a common semantical standard for eInvoicing – the PEPPOL BIS
- PEPPOL initiated the process of interoperability and connectivity between the ”Islands of Procurement” in Europe
- At the end of August 2012 the PEPPOL project was finalised, and all services was handed over to the new non-profit association ”OpenPEPPOL”

European Commission

Background and history of CEF eInvoicing – eSENS.eu

- In April 2013 a new project eSENS.eu was initiated again bringing in the public procurement domain and eInvoicing
- During the eSENS project lifetime the directive on public procurement was voted for by the European Parliament and Council
- Main focus for eSENS was further improvements to the common components and building blocks of the past Large Scale Pilots - including new transport components for eDelivery and conformance testing of new semantical mapping and eDocuments
- For eInvoicing this mainly meant piloting with existing PEPPOL BIS standards, as CEN was not ready with the new European standard for eInvoicing

Background and history of CEF eInvoicing - Now

- At the end of March 2017 the eSENS was finalised, and most developed services and building blocks was handed over to the European Commission for further development, maintenance and support

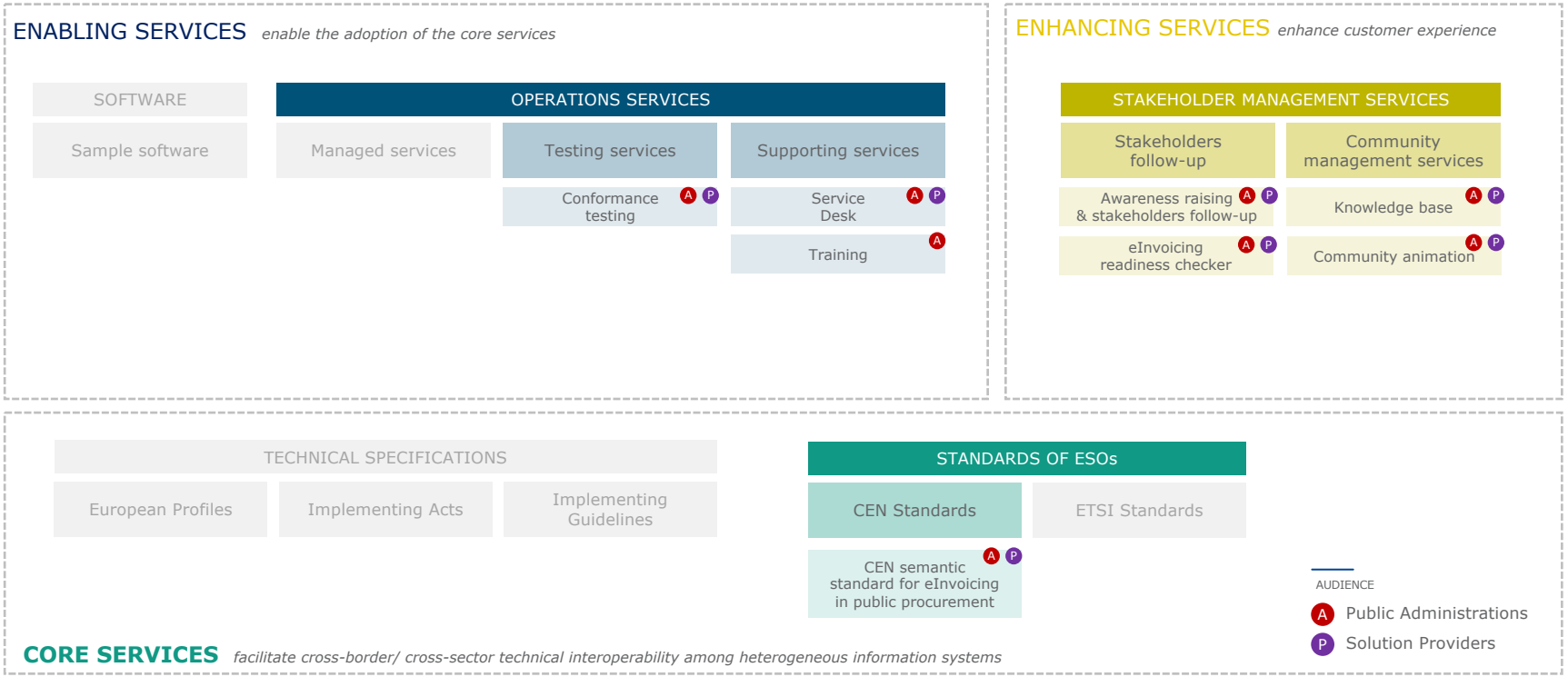
- This included the testing of eInvoicing PEPPOL BIS on eSENS eDelivery AS4 results between the partners of eSENS including a number of eDelivery solution providers

- A number of the partners in eSENS and within the eInvoicing piloting has then applied for CEF eInvoicing funding through the grants made available by the European Commission – more on this later…

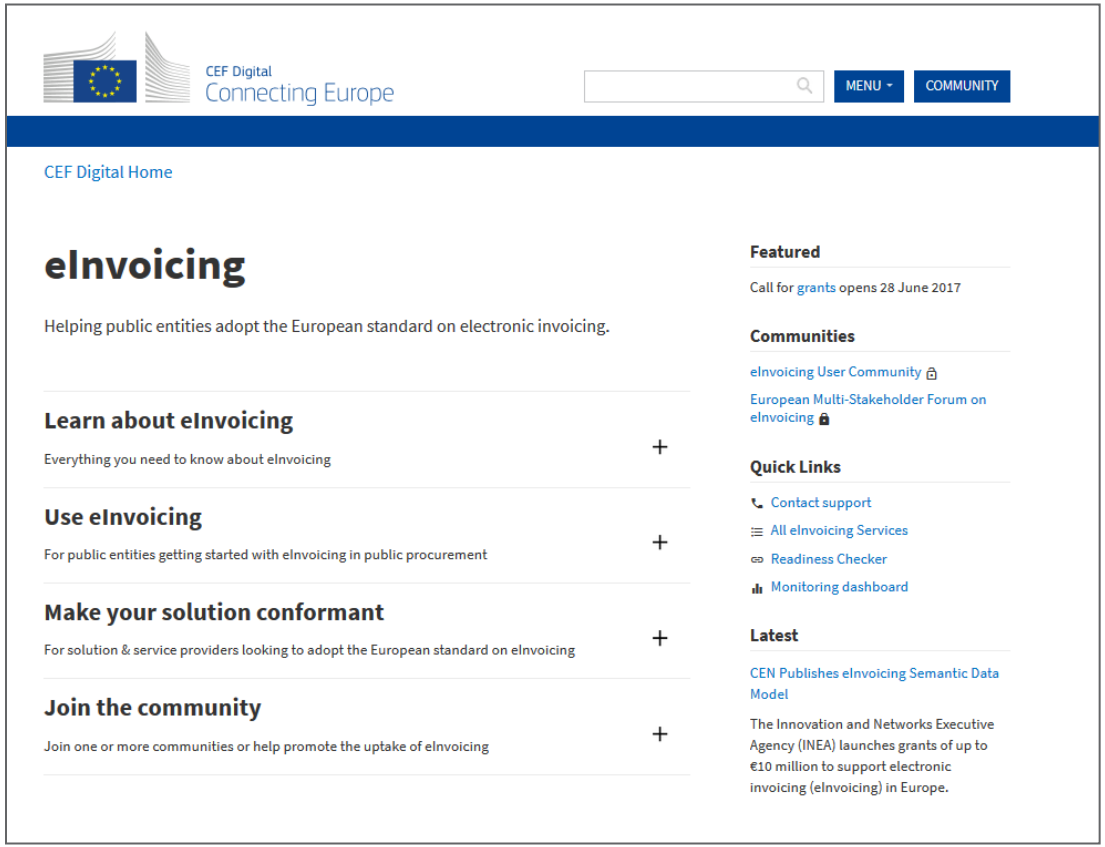
4

Our services

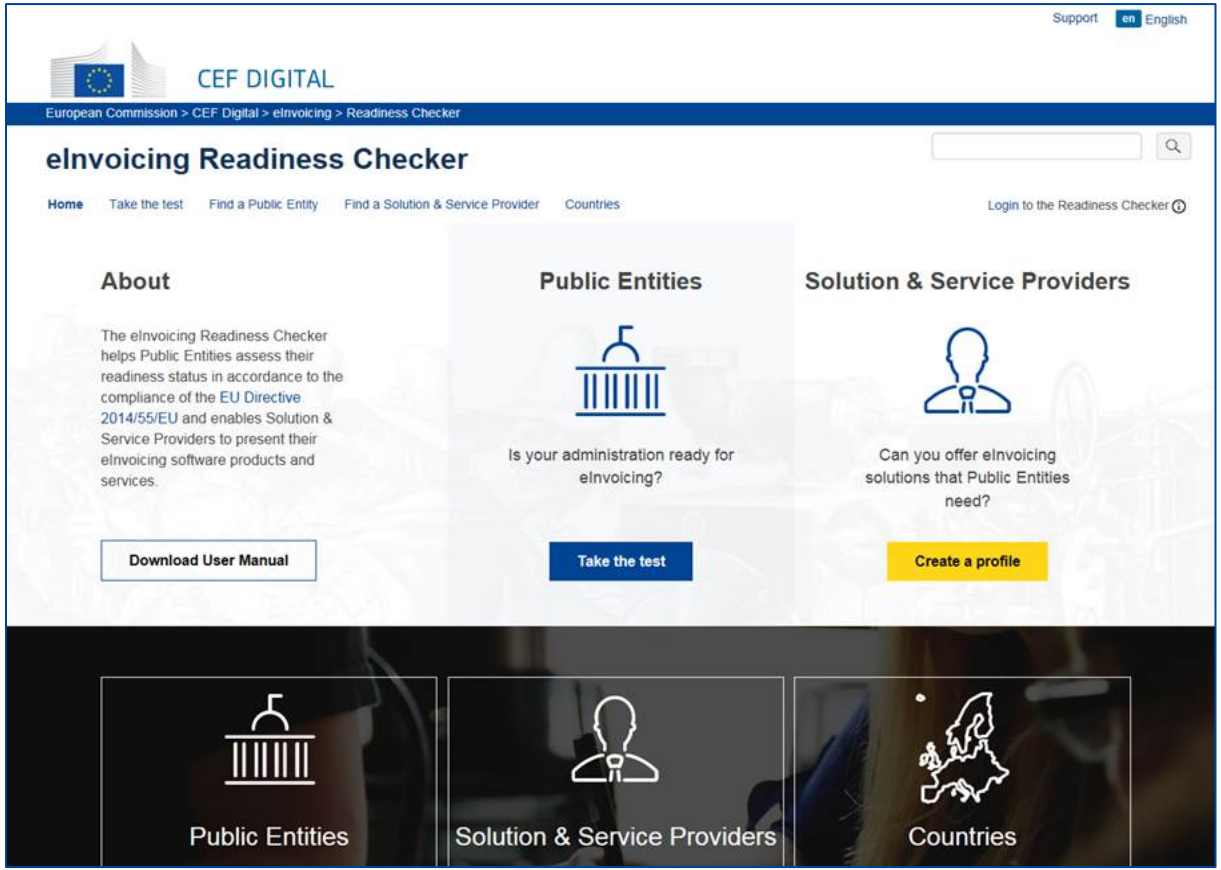
CEF eInvoicing Service Offering



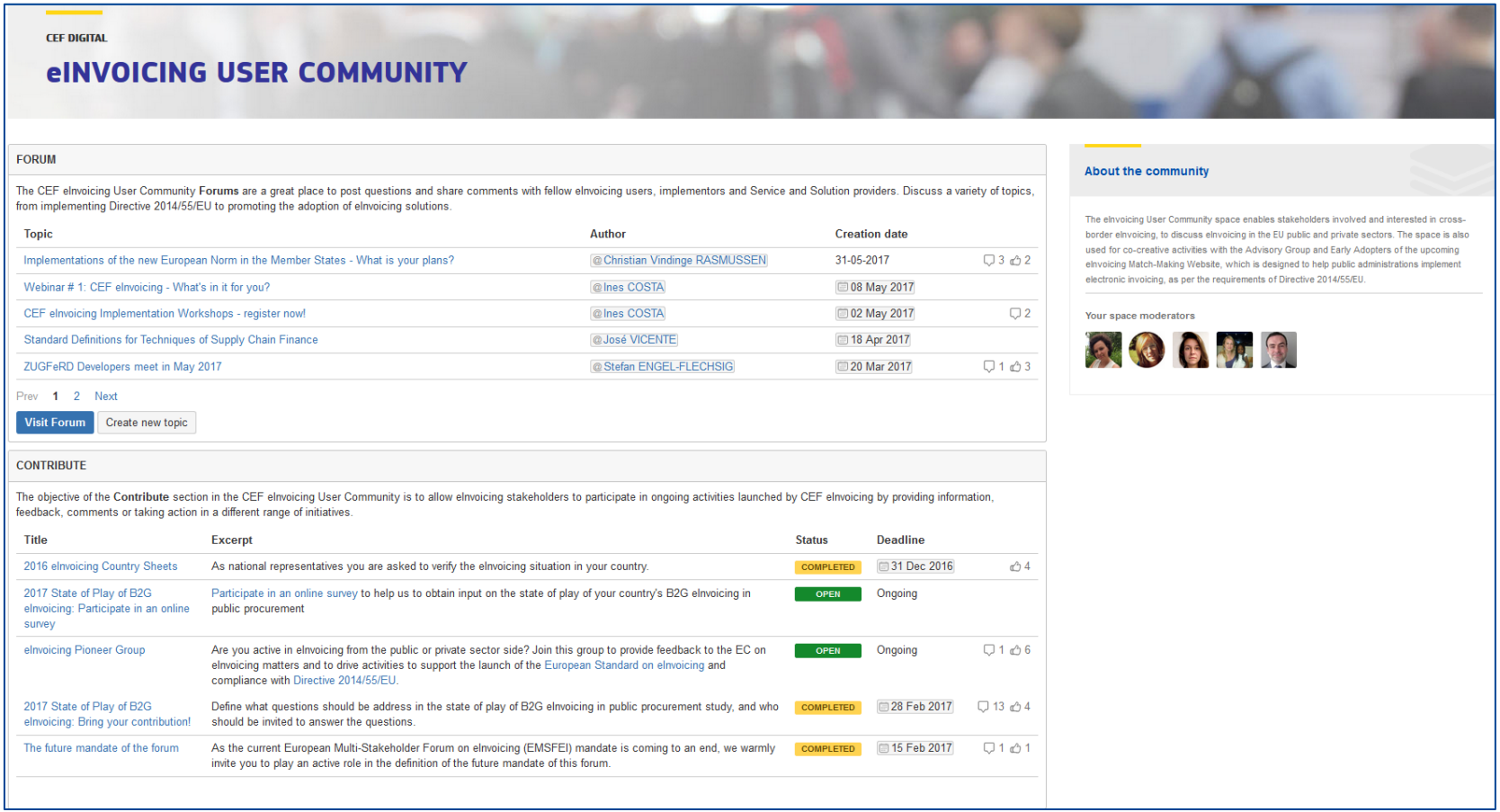
CEF Digital


CEF Digital
Connecting Europe
MENU
COMMUNITY
CEF Digital Home
eInvoicing
Helping public entities adopt the European standard on electronic invoicing.
Learn about eInvoicing
Everything you need to know about eInvoicing
Use eInvoicing
For public entities getting started with eInvoicing in public procurement
Make your solution conformant
For solution & service providers looking to adopt the European standard on eInvoicing
Join the community
Join one or more communities or help promote the uptake of eInvoicing
Featured
Call for grants opens 28 June 2017
Communities
eInvoicing User Community
European Multi-Stakeholder Forum on eInvoicing
Quick Links
Contact support
All eInvoicing Services
Readiness Checker
Monitoring dashboard
Latest
CEN Publishes eInvoicing Semantic Data Model
The Innovation and Networks Executive Agency (INEA) launches grants of up to €10 million to support electronic invoicing (eInvoicing) in Europe.

eInvoicing Readiness Checker



eInvoicing User Community



European Commission

CEF eInvoicing Trainings

Implementation workshops

- Typically at least one full or one half-day workshop;
- Possibly in combination with **bilateral meetings** b/w EC and MS;
- Currently workshops planned in **Cyprus**, **Finland** and **Poland**;
- **Apply** here: CEF-BUILDING-BLOCKS@ec.europa.eu

Remote trainings

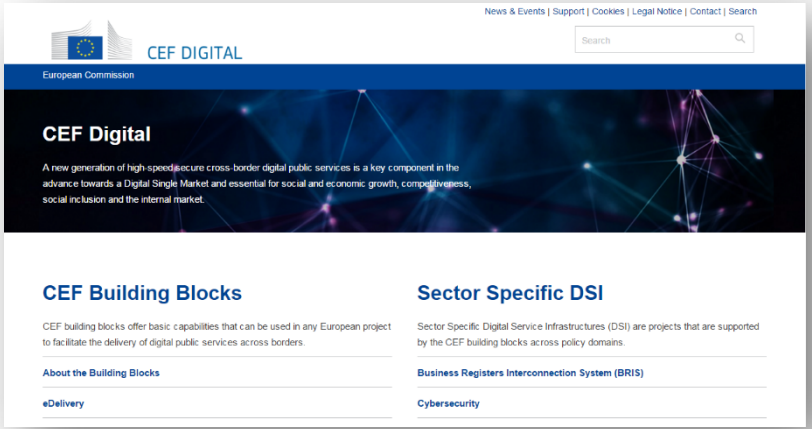
- Live sessions on a focused eInvoicing topic for a specialised target audience;
- 1-3 hour-long sessions provided on-line;
- Focused training sessions on key areas derived from the on-site workshops.

Webinars

- About 1 hour-long sessions with core elements from on-site and remote trainings to gain expertise in key areas.

5 How to get started

Interested to find out more?



Visit the CEF Digital Single Web Portal
https://ec.europa.eu/cefdigital/

DG GROW
Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

DIGIT
Directorate-General for Informatics

Contact us

CEF-BUILDING-BLOCKS@ec.europa.eu

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More webinars on eInvoicing

Upcoming Webinars Related to the Standard and the Directive

September The European norm and its content (eInvoicing Directive)

October Infrastructure based on CEF eDelivery DSI

November Examples of Early Adopters of large scale eInvoicing

December eInvoicing from a user's perspective (incl. ordering & payments)

January Technical webinars

Basic XML + XML Validation mechanisms + OASIS UBL 2.1 and UN/CEFACT CII D16B

February

More information on the events can be found here:
https://ec.europa.eu/cefdigital/wiki/x/MQHpAQ

Webinar # 4: Infrastructure based on the eDelivery DSI architecture

- 2 October
- This webinar will provide information on the eDelivery DSI infrastructure in the context of **eInvoicing**
- **Register** here

Participants will learn about:

- Background of the **eDelivery DSI** infrastructure in the context of electronic invoicing in public procurement
- Important **concepts** and **definitions**
- Overview of **architecture**, underlying **requirements** and **data models**

Questions

Do you have a profile at CEF Digital?

Do you see other areas where trainings or webinars could be of interest?

Introduction to eInvoicing, the European standard and it’s legal background

Martin Forsberg

DIGIT

Agenda

1. **A few words from the Directive on electronic invoicing in public procurement**
2. **eInvoicing from a user perspective**
3. **The development of the European standard on eInvoicing**
4. **Introduction to key concepts of the standard**
5. **Interoperability and validation**
6. **Usage specifications and compliance**

Background

- Problems with **many standards**
- **Lack of normative contextualised standards** (only workshop agreements)
- **Different approaches and ambitions** in Member States to implementing eInvoicing and eProcurement
- The Directive on electronic invoicing in public procurement (Directive 2014/55/EU) was developed, setting a **minimum requirement** for the public sector

> **From the Directive**
>
> *The benefits of electronic invoicing are maximised when the generation, sending, transmission, reception and processing of an invoice can be fully automated.*
>
> *…*
>
> *A mere image file should not be considered to be an electronic invoice for the purpose of this Directive.*

Requirements for the contracting authorities/entities

From article 7

Receipt and processing of electronic invoices

*Member States shall ensure that contracting authorities and contracting entities **receive and process electronic invoices** which comply with the **European standard on electronic invoicing** whose reference has been published pursuant to Article 3(2) and with **any of the syntaxes on the list** published pursuant to Article 3(2).*

a list with a limited number of syntaxes which comply with the European standard on electronic invoicing

Semantic data model of the core elements of an electronic invoice

Definitions

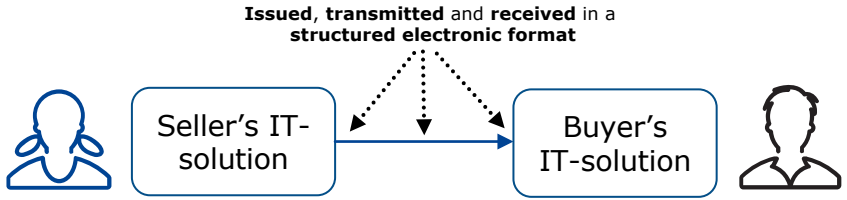
(1) **‘electronic invoice’** means an invoice that has been issued, transmitted and received in a structured electronic format which allows for its automatic and electronic processing;

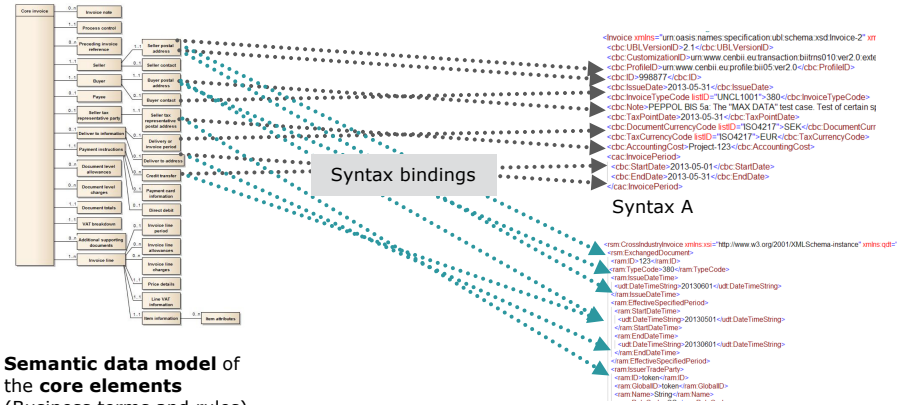
(2) ‘**core elements of an electronic invoice**’ means a set of essential information components which an electronic invoice must contain in order to enable cross-border interoperability, including the necessary information to ensure legal compliance;

(3) ‘**semantic data model**’ means a structured and logically interrelated set of terms and their meanings that specify the core elements of an electronic invoice;

(4) ‘**syntax**’ means the machine readable language or dialect used to represent the data elements contained in an electronic invoice;

(5) ‘**syntax bindings**’ means guidelines on how a semantic data model for an electronic invoice could be represented in the various syntaxes;





Semantic data model of the **core elements** (Business terms and rules)

European Commission

2 eInvoicing from a user perspective

Many different options – creation of the eInvoice

Creation of the eInvoice

- Directly from the ERP/Accounting system
  - Often internal format which is transformed into exchange format
- Through a web-portal
  - Provided by the customer
  - By supplier's own choise
- Printer capture/Virtual printer
  - Software installed as printer
  - When printing, the data is captured and transformed to an eInvoice
- Service provider
  - Offers many value added services such as transformation to the correct format

Prefered option may depend on
- ***Volume of invoices***
- ***Size of supplier***
- ***Requirement from customer***

Many different options – transmission of the eInvoice

Transmission of the eInvoice

- 4-corner model – often with help from a service provider
  - Connected to network of other service providers
  - Connected to eDelivery network
- 3-corner model – both trading partners are using the same platform
- Peer-to-peer, direct connection
  - FTP, web service/API
- E-Mail:
  - Challenging with structured format only
  - Hybrid/pdf

Interconnectivity with the customers' solutions important!

Important components to have in place

- Service for receiving eInvoices
  - The ”inbox” or technical entry point
  - May support several formats
  - Important aspects: connectivity with other service providers, logging, validation and archiving
- Workflow for eInvoice/eProcurement solution
  - For handling the eInvoices in an efficient manner
  - Visualization, assessment/approval
  - Sometimes integrated in the ERP but often a separate service
- ERP/Accounting solution
  - For accounting and payment initation

Integration between above solutions

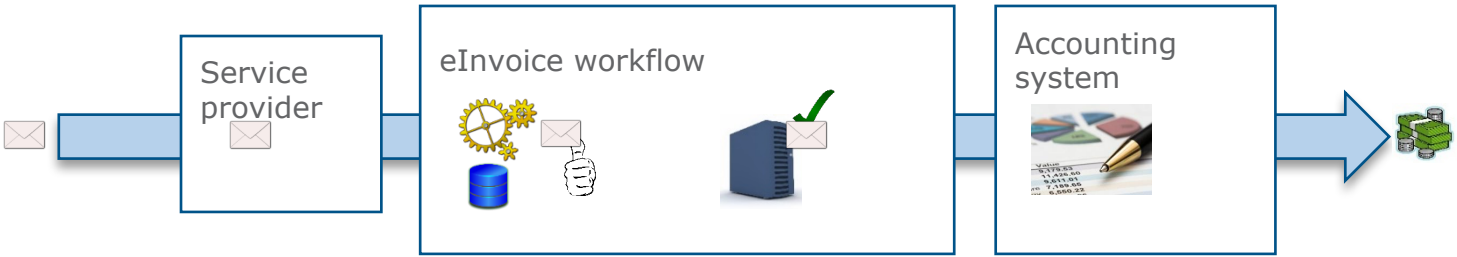
Centralized or decentralized handling of invoice assessment

- For invoices which are not automatically matched, a manual assessment is necessary
- By using references, the invoice can be forwarded directly to the person/role responsible for assessing the invoice
  - Requires a workflow system
  - Important with data quality of the reference value
  - Sometimes hard to make the supplier to provide/enter the reference
- Without available references, all invoices are received by a single entry point
  - Person/function assessing or forwards the invoice to the relevant person

Buyer process

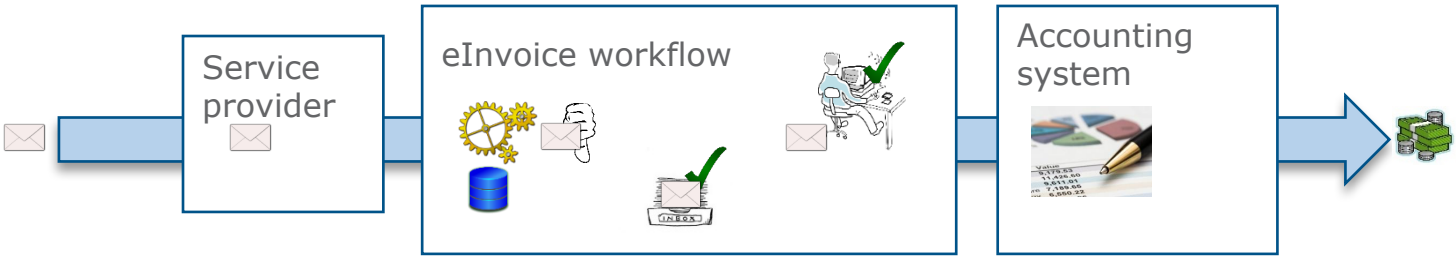
- The invoice is routed automatically to the workflow
- The supplier is known by the buyer
- There is a reference in the invoice for forwarding in the workflow
- The invoice is assessed, approved and payment is initiated

Buyer process
Automated assessment/validation



- The invoice is routed automatically to the workflow
- The supplier is known by the buyer
- The invoice has a reference to an order or a registered object (e.g subscription number, rent object id). Rules for approval is associated with the registered object
- The invoice is assessed, approved and payment is initiated

Buyer process
Unknown supplier



- The invoice is routed automatically to the workflow
- The supplier is not known by the buyer and is placed in a queue for handling
- The supplier is accepted and registered in the system
- There is a reference in the invoice for forwarding in the workflow
- The invoice is assessed, approved and payment is initiated

Question

Do the public entities in this country have electronic workflow support for managing invoices (paper/scanned/electronic)?

3 The development of the European standard on eInvoicing

Initiation of the standardisation

From article 3

*The Commission shall request that the relevant **European standardisation organisation** draft a European standard for the semantic data model of the core elements of an electronic invoice (the 'European standard on electronic invoicing').*

…

The Commission shall request that the relevant European standardisation organisation provide a list with a limited number of syntaxes which comply with the European standard on electronic invoicing, the appropriate syntax bindings and guidelines on transmission interoperability, in order to facilitate the use of such standard.

…

That publication shall be completed by 27 May 2017.

Standardisation request

Shall take into account where relevant:
- CII XML V2 and v3
- UBL 2.1
- Financial Invoice
- other formats (e.g. EDIFACT)
- other relevant technical specifications

International eInvoice standard formats

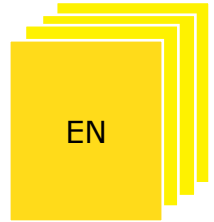
Should be based on:
- BII
- MUG

Existing European core eInvoice models

Should also take into account:
- EIF
- ISA Interoperability Solutions
- Results of LSP projects
- DSI on eInvoicing

Various related European projects

Development of EN and ancillary standardization deliverables



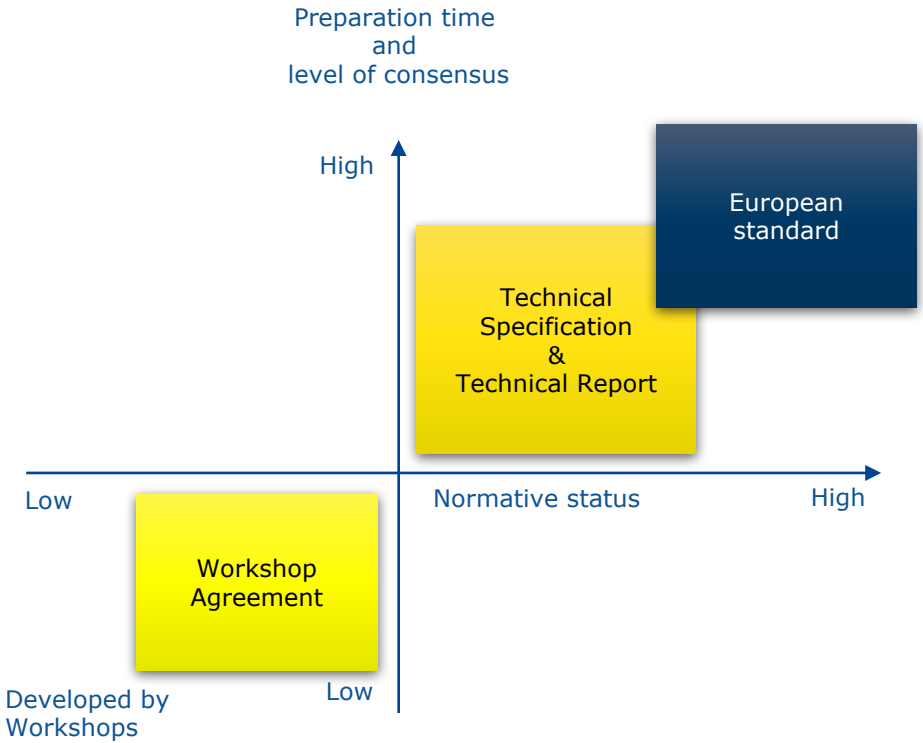
The EN shall fulfil a list of "specific requirements" From the Directive and EC

The standards organisation shall also take into account:
- any relevant material from the EMSFeI
- documents to be used during the e-procurement process
- the possibility of allowing multilingualism and multicurrency usage
- preservation of the existing investments

Other initiatives and existing work

CEN/TC 434 was established

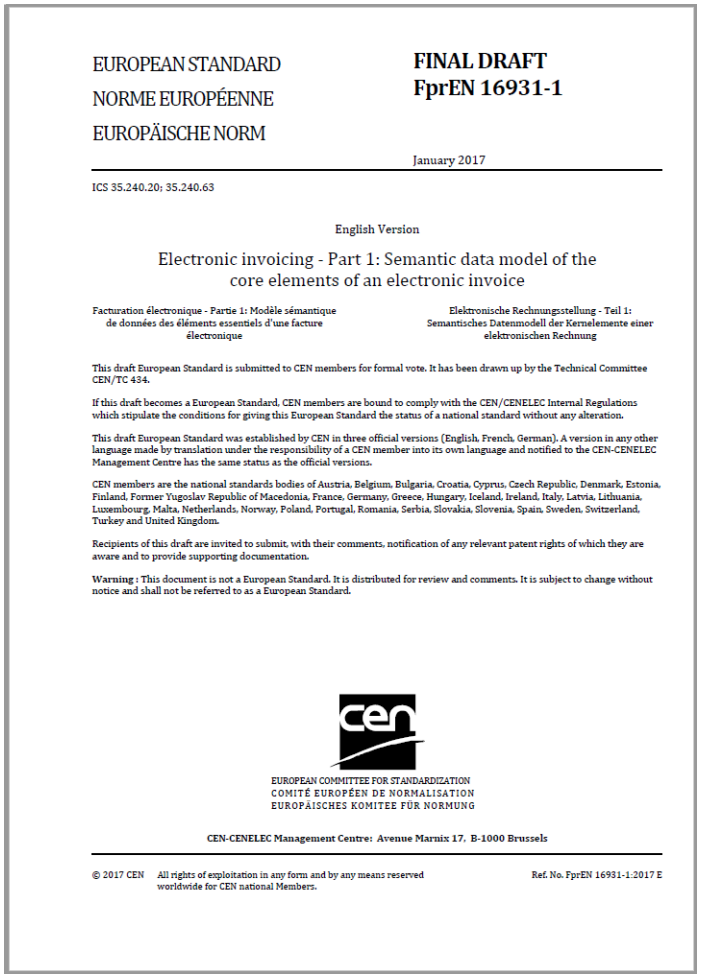
- CEN - European Committee for Standardisation
- The work started in a project committee (PC434) but was later changed into a technical committee (TC434)
- TC434 has over 100 committee members from 31 countries
- Participation in the work must go through the national standardisation committees.
- The committee is about to finalize all deliverables defined in the standardisation request



Current status

Number	Title	Status
EN 16931-1	Semantic data model of the core elements of an electronic invoice	Approved!
CEN/TS 16931-2	List of syntaxes that comply with EN 16931-1	Approved!
CEN/TS 16931-3-1	Methodology for syntax bindings of the core elements of an electronic invoice	Approved!
CEN/TS 16931-3-2	Syntax binding for ISO/IEC 19845 (UBL2.1) invoice and credit note	Approved!
CEN/TS 16931-3-3	Syntax binding for UN/CEFACT XML Cross Industry Invoice D16B	Approved!
CEN/TS 16931-3-4	Syntax binding for UN/EDIFACT D16B	Approved!
CEN/TR 16931-4	Guidelines on interoperability of electronic invoices at the transmission level	Approved!
CEN/TR 16931-5	Guidelines on the use of sector or country extensions in conjunction with EN 16931-1, methodology to be applied in the real environment	Approved!
CEN/TR 16931-6	Result of the test of EN 16931-1 with respect to its practical application for an end user	Work in progress

4 Introduction to key concepts of the standard



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 16931-1

January 2017

ICS 35.240.20; 35.240.63

English Version

Electronic invoicing - Part 1: Semantic data model of the core elements of an electronic invoice

Facturation électronique - Partie 1: Modèle sémantique de données des éléments essentiels d'une facture électronique

Elektronische Rechnungsstellung - Teil 1: Semantisches Datenmodell der Kernelemente einer elektronischen Rechnung

This draft European Standard is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee CEN/TC 434.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. FprEN 16931-1:2017 E

Section 1-3 - Scope, references, terms & definitions

- Section 4 – The concept of a core invoice
- Section 5 – Business process to support
- Section 6 – The semantic model, rules and data types
- Section 7 – Core Invoice Usage Specification (and compliance)

Annex A – Examples (Informative)

Annex B – Assessment of the EN towards the Standardization request (Informative)

Annex C – How does the EN meet legal requirements (Informative)

Annex D – BPMN symbols (informative)

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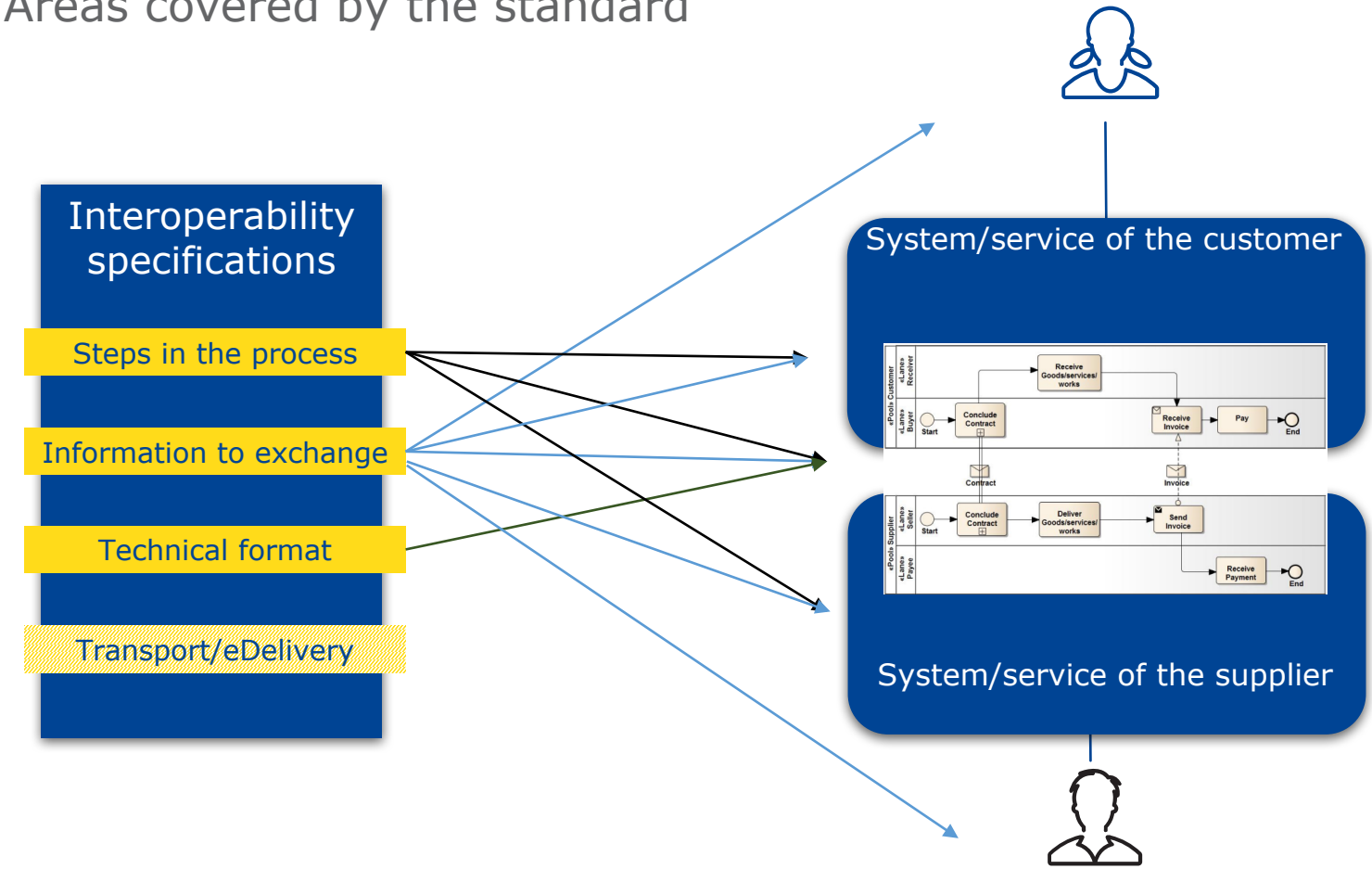
Areas covered by the standard



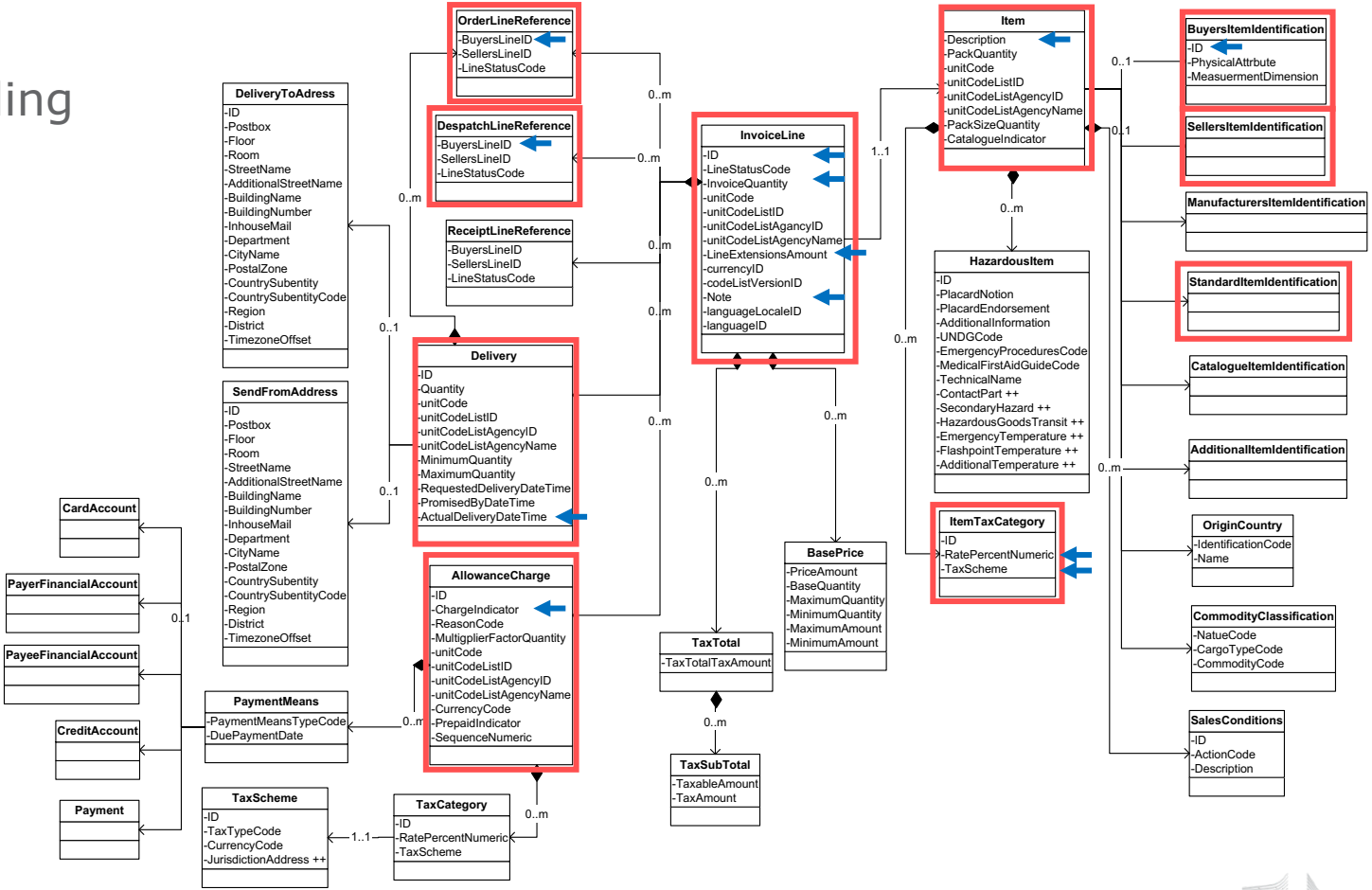
Reasons for a core invoice

The European standard recognises the following reasons:

- Business environment is diverse – also the need for information exchange
- Invoices from different situations may potentially contain many information elements – a complete model becomes very large and complex
- Even if it would technically be possible to have a large model, it would be challenging and costly
- When different countries/industries use subset of large standards, interoperability is hampered and silo-implementations are created

EN 16931-1:2017 Chapter 4

Common understanding



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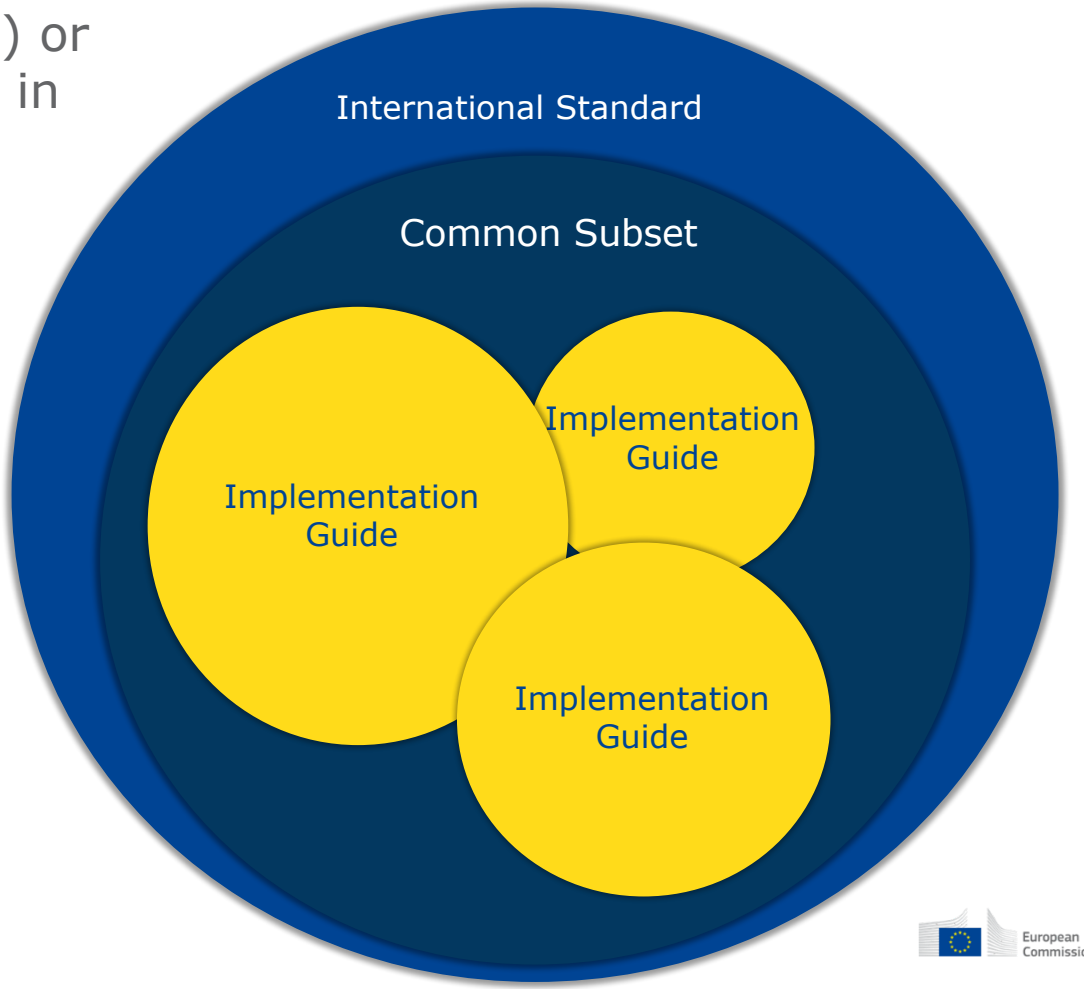
Core (minimum in common) or common subset (maximum in common)

The subset approach

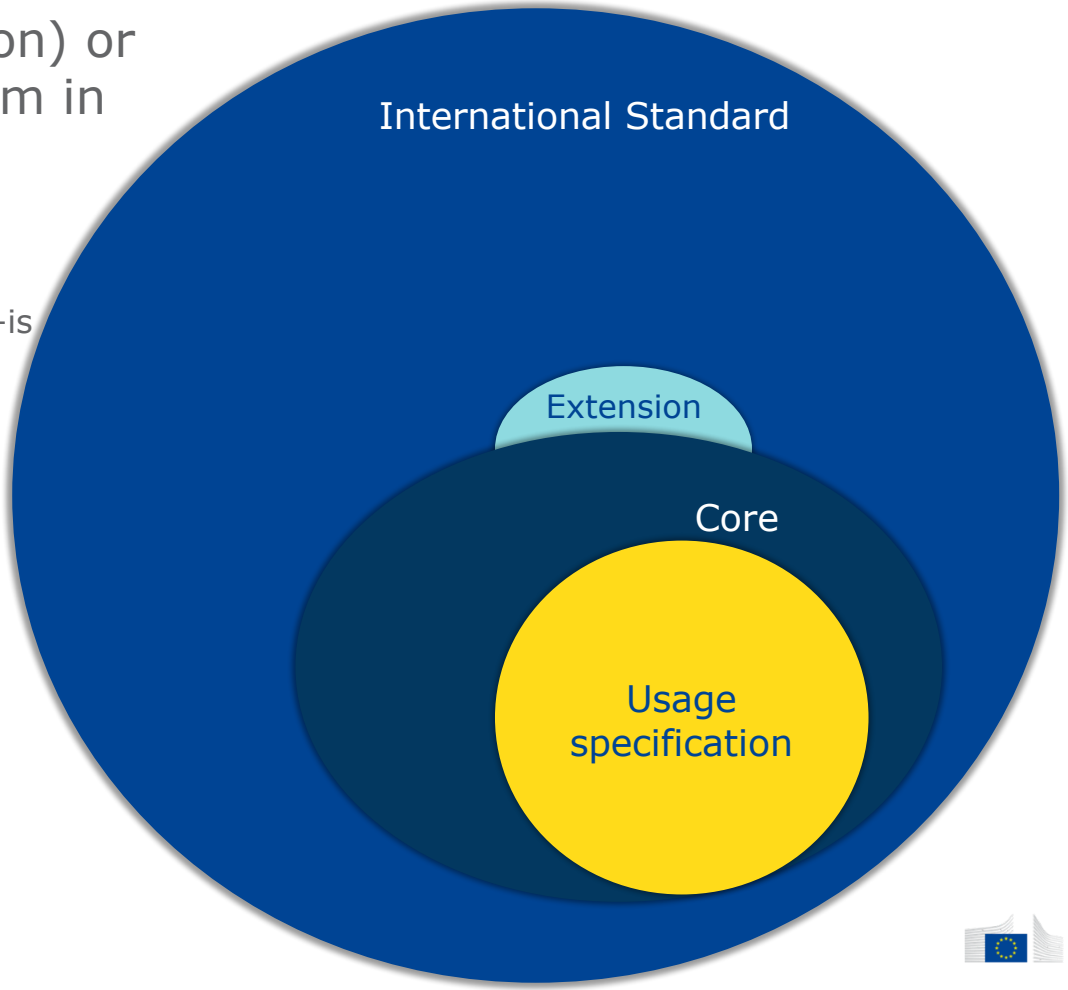
- The subset becomes the framework/outer boundaries



Core (minimum in common) or common subset (maximum in common)

The core approach

- The core is intended to be used as-is
- Can also be extended or restricted



The concept of a core invoice – How?

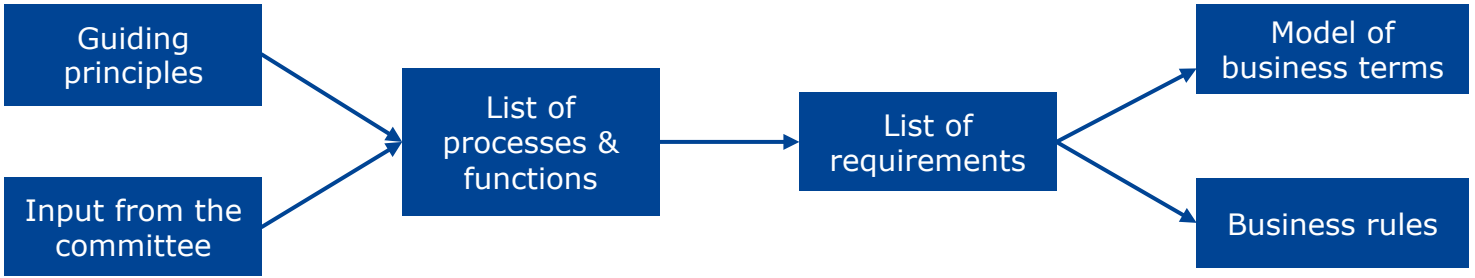
The norm identifies a few **guiding principles**:

- It should be easier to use than paper invoicing
- Standardised information elements makes processing more efficient (than paper invoices)
- It should be possible to use without prior consultation or bilateral agreements
- It should contain information to enable efficient and automatic processing
- Software should be able to present all information, and automatically process structured data
- Structured data should result in optimised business processes
- The core invoice model should not make assumptions on the method of creation, delivery or processing
- The core invoice model should not make assumptions on the syntax or transmission technology

EN 16931-1:2017 Chapter 4

Requirement driven approach on defining the model

- Each business term in the model comes from one or more documented (and numbered) requirement
- The requirements give a good understanding of the background



Business processes to support

The invoice model contains information elements to support the following processes

— P1: Invoicing of deliveries of goods and services against purchase orders, based on a contract

— P2: Invoicing deliveries of goods and services based on a contract

— P3: Invoicing the delivery of an incidental purchase order

— P4: Pre-payment

— P5: Spot payment

— P6: Payment in advance of delivery

— P7: Invoices with references to a despatch advice

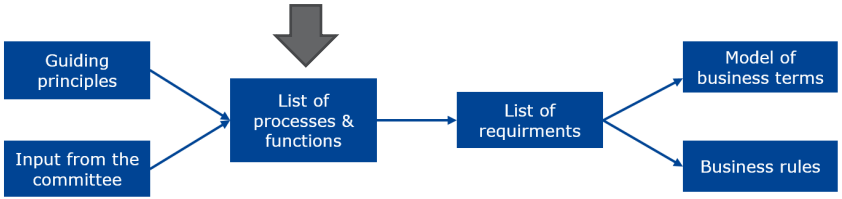
— P8: Invoices with references to a despatch advice and a receiving advice

— P9: Credit notes or invoices with negative amounts, issued for a variety of reasons including the return of empty packaging

— P10: Corrective invoicing (cancellation/correction of an invoice)

— P11: Partial and final invoicing

— P12: Self billing



EN 16931-1:2017 Chapter 5.2.1

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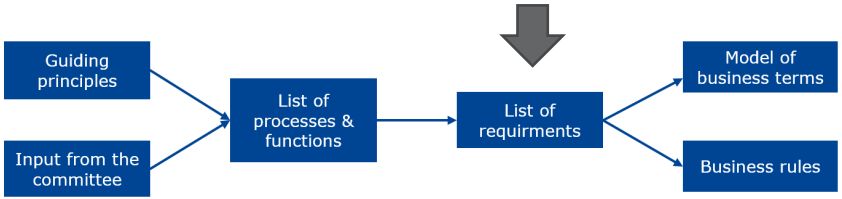
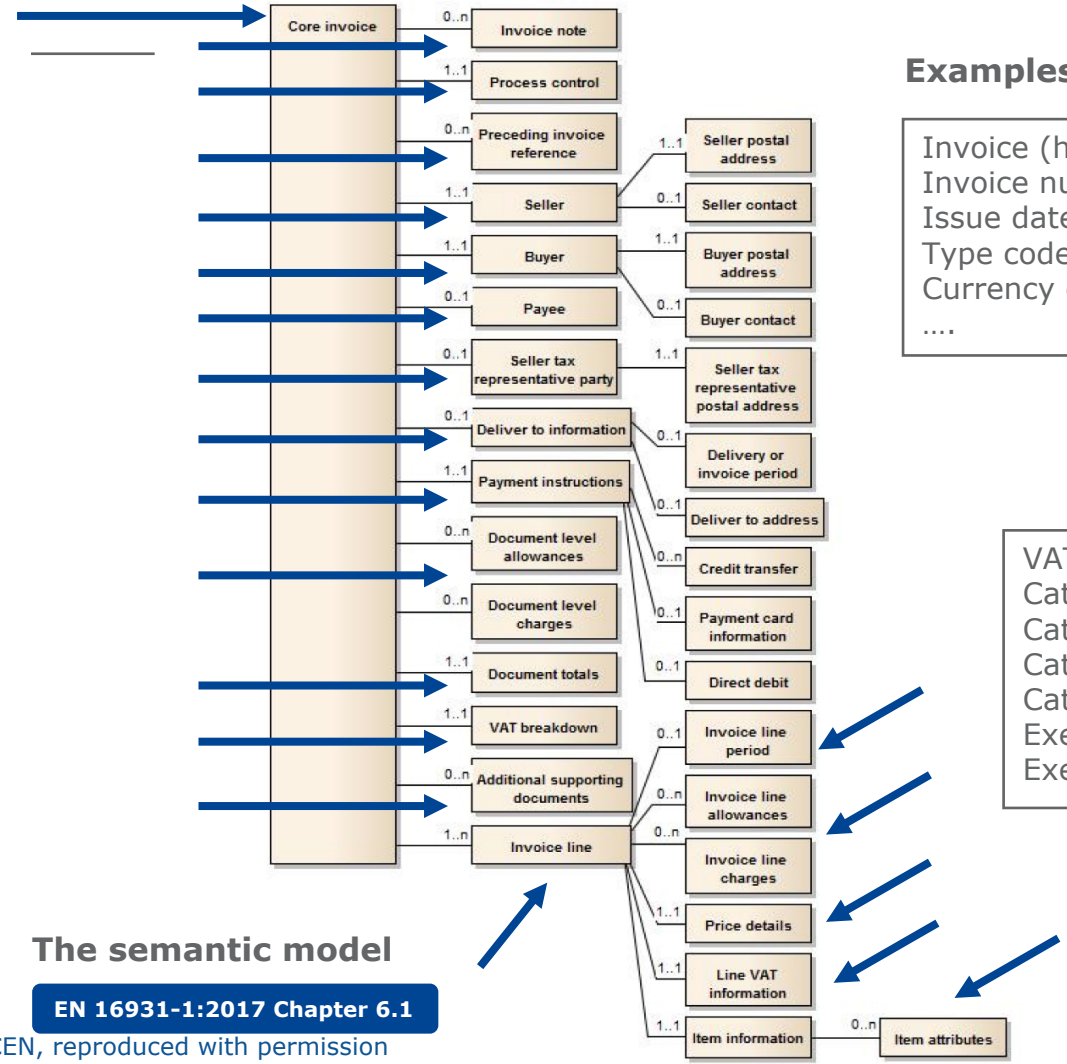
Business requirements derived from the processes

- Based on the identified processes and listed invoice functions, requirements are defined
- Each requirement has an assigned identifier

R5	information to trace to a single related purchase order from the document level (all processes, except P2 and P5);
R6	information to trace to a single related purchase order line from the invoice line (all processes, except P2 and P5);
R7	information to trace to a single contract and the underlying call for tenders from the document level (all processes, except P3 and P5);



EN 16931-1:2017 Chapter 5.3



Examples of key components

Invoice (header)
Invoice number (1..1)
Issue date (1.1)
Type code (1.
Currency cod
….

Seller information
Name (1..1)
Trading name (0..1)
Identifier (0..n)
Legal registration identifier (0..1)
VAT num
Additiona
…

Payment instructions
Payment means type code (1..1)
text (0..1)
(0..1)

VAT Breakdown
Category taxable amount (1..1)
Category tax amount (1..1)
Category code
Category rate
Exemption text
Exemption cod

Item information
Name (1..1)
Description (0..1)
Sellers identifier (0..1)
Buyers identifier (0..1)
Standard identifier (0..1)
Item classification (0..n)
Country of origin (0..1)

The semantic model

EN 16931-1:2017 Chapter 6.1

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Examples of business terms

ID	Level	Cardinality	Business Term	Description	Usage Note	Req. ID	Semantic data type [2]
BT-1	+	1..1	Invoice number	A unique identification of the Invoice.	The sequential number required in Article 226(2) of the directive 2006/112/EC [2], to uniquely identify the Invoice within the business context, time-frame, operating systems and records of the Seller. It may be based on one or more series of numbers, which may include alphanumeric characters. No identification scheme is to be used.	R56	Identifier
BT-2	+	1..1	Invoice issue date	The date when the Invoice was issued.		R56	Date
BT-3	+	1..1	Invoice type code	A code specifying the functional type of the Invoice.	Commercial invoices and credit notes are defined according the entries in UNTDID 1001 [6]. Other entries of UNTDID 1001 [6] with specific invoices or credit notes may be used if applicable.	R44	Code

ID – Unique id for each business term

Level – indicates depth in model (+, ++, +++, ++++)

Cardinality – Indicates optionality, repetitions allowed

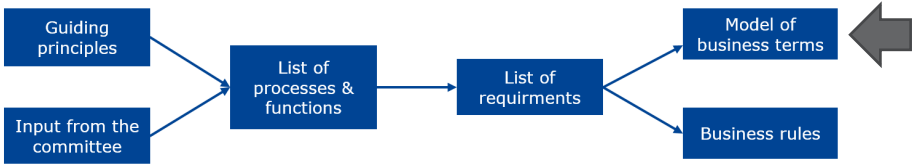
Business term – name of the business term

Description – short description/definition

Usage note – guiding/explanatory information

Req id – reference to underlying requirement

Data type – the type of



EN 16931-1:2017 Chapter 6.3

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Semantic datatypes

Primitive types
- Binary
- Date
- Decimal
- String

Primitive types used in

Semantic datatypes
- Amount (two decimals)
- Unit Price Amount
- Quantity
- Percentage
- Identifier
- Document reference
- Code
- Date
- Text
- Binary object

Data types can have suplamentary components/attributes

Component	Use	Primitive Type	Example
Content	Mandatory	Binary	
Mime Code	Mandatory	String	"image/jpeg"
Filename	Mandatory	String	"drawing5.jpg"

A Receiver of an Invoice, conformant to this document shall accept and process attachments that are of the following mime types (commonly used file extensions are added between brackets):

— application/pdf (.pdf)

— image/png (.png)

— image/jpeg (.jpg)

— text/csv (.csv)

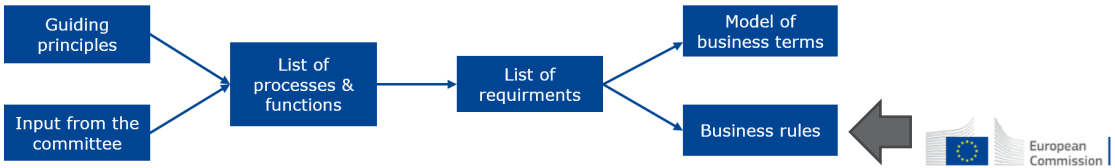
— application/vnd.openxmlformats-officedocument.spreadsheetml.sheet (.xslx)

— application/vnd.oasis.opendocument.spreadsheet (.ods)

EN 16931-1:2017 Chapter 6.5

Business rules

- In addition to the business terms in the semantic model, rules have been defined
- Expressed as an assertion, a statement which should be true ”An Invoice shall have an Invoice number”
- **Integrity constraints** – mandatory elements and rules against negative values
  - The data model is also expressing these through the cardinality
  - The syntaxes may or may not have the same restrictions – if not, the integrity constraint can be implemented through a schematron rule
- **Conditions** – dependencies between business terms
  - Not possible to see by just assessing the business terms
  - The syntaxes do not have these rules built in, but they can be implemented through schematron rules
- All rules are normative – an invoice message shall (MUST) follow the rules to be considered compliant



Business rules - Integrity constraints

- Integrity constraints (In many cases, the data model cardinality indicates the same thing)

ID	Description	Target / context	Business term / group
BR-20	The Seller tax representative postal address shall contain a Tax representative country code, if the Seller has a tax representative party.	Seller tax representative postal address	BT-69
BR-21	Each Invoice line shall have an Invoice line identifier.	Invoice Line	BT-126
BR-22	Each Invoice line shall have an Invoiced quantity.	Invoice Line	BT-129
BR-23	An invoice line shall have an Invoice quantity unit of measure.	Invoice Line	BT-130

ID – Unique id for each business rule

Description – textual description of the rule

Target/Context – the cgroup/class for where the rule applies

Business term/group – reference to the term for which the rule applies

EN 16931-1:2017 Chapter 6.4.1

Business rules - Conditions

- Conditions – dependencies between terms

ID	Description	Target / context	Business term / group
BR-CO-8	Invoice line charge reason code and Invoice line charge reason shall indicate the same type of charge reason.	Invoice line Charges	BT-144, BT-145
BR-CO-9	The Seller VAT identifier, Seller tax representative VAT identifier, Buyer VAT identifier shall have a prefix in accordance with ISO code ISO 3166-1 alpha-2 by which the country of issue may be identified. Nevertheless, Greece may use the prefix 'EL'.	VAT identifiers	BT-31, BT-48, BT-63
BR-CO-10	Sum of Invoice line net amount = ∑ Invoice line net amount.	Document totals	BT-106

ID – Unique id for each business rule

Description – textual description of the rule

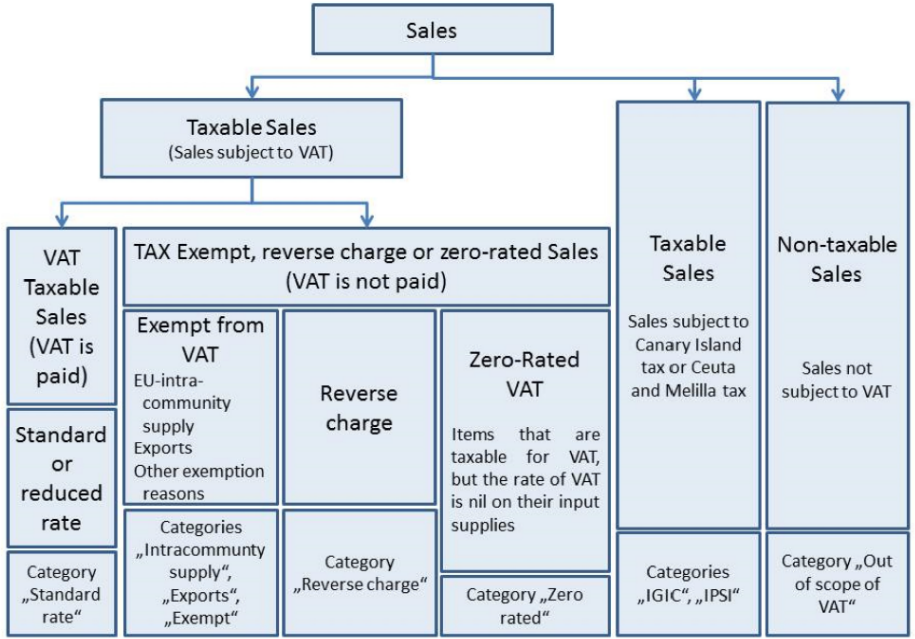
Target/Context – the cgroup/class for where the rule applies

Business term/group – reference to the term for which the rule applies

EN 16931-1:2017 Chapter 6.4.2

Business rules – VAT Rules

- VAT Rules – Rules for each VAT category



ID	Description
BR-Z-1	An Invoice that contains a line, a document level allowanc where the Invoiced item VAT category code (BT-151, BT- shall contain in the VAT breakdown (BG-23) exactly one equal with “Zero rated”.
BR-Z-2	An Invoice that contains a line where the Invoiced item VAT category code (BT-151) is “Zero rated” shall contain the Sellers VAT Identifier (BT-31), the Seller Tax registration identifier (BT-32) or the Seller tax representative VAT identifier (BT-63).
BR-Z-3	An Invoice that contains a document level allowance where the Invoiced item VAT category code (BT-95) is “Zero rated” shall contain the Sellers VAT Identifier (BT-31), the Seller Tax registration identifier (BT-32) or the Seller tax representative VAT identifier (BT-63).

EN 16931-1:2017 Chapter 6.4.3

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Question

Which eInvoicing formats are you currently using?

The European standard requires a very high level of information quality. Can this prove to be a challenge in your coming implementation?

5 Interoperability and validation

XML Schema and Schematron – techniques used in the standard to test compliance

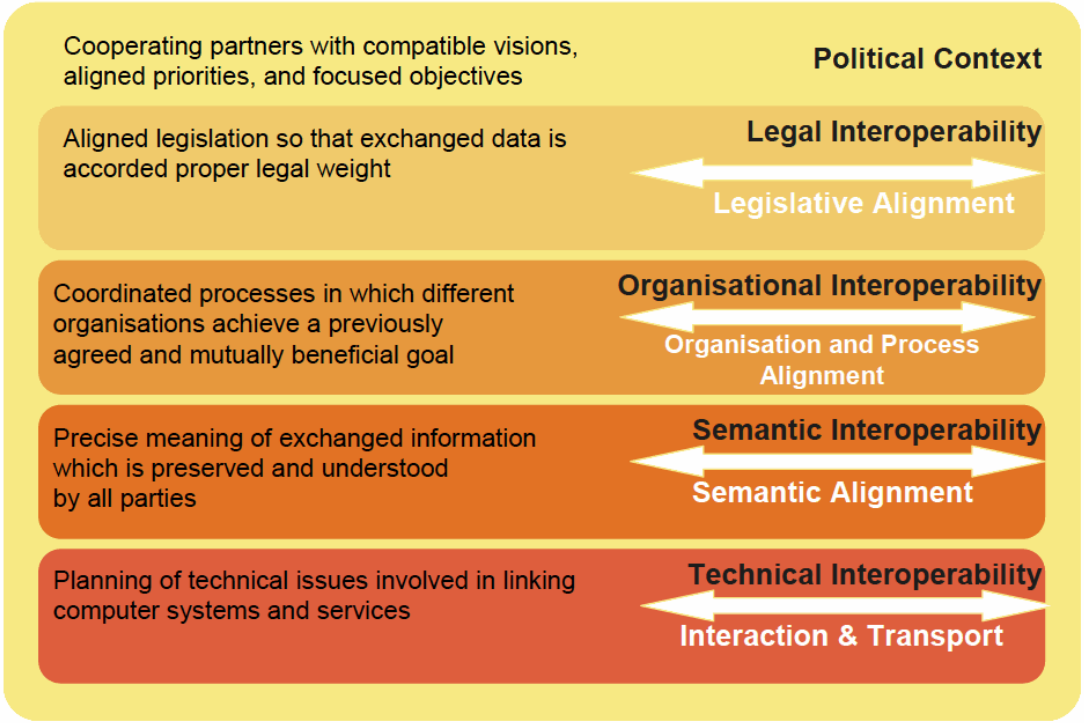
XML Schema

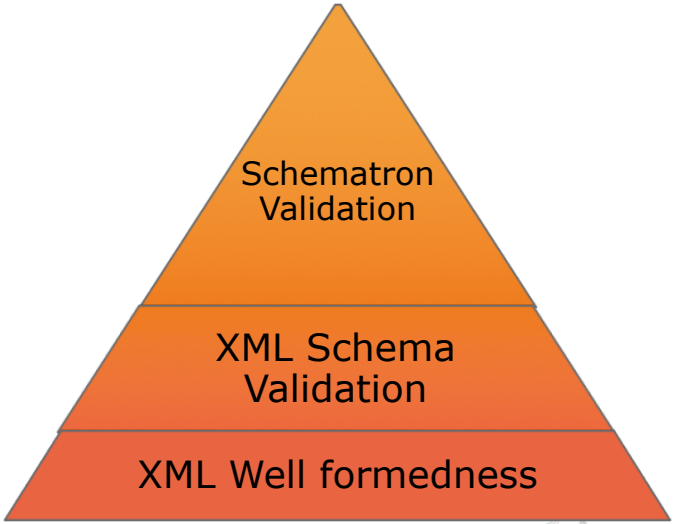
- Vocabularies and document models
- Datatypes and formats
- Structures and order
- *Everything which isn’t explicitly allowed is forbidden!*

Schematron

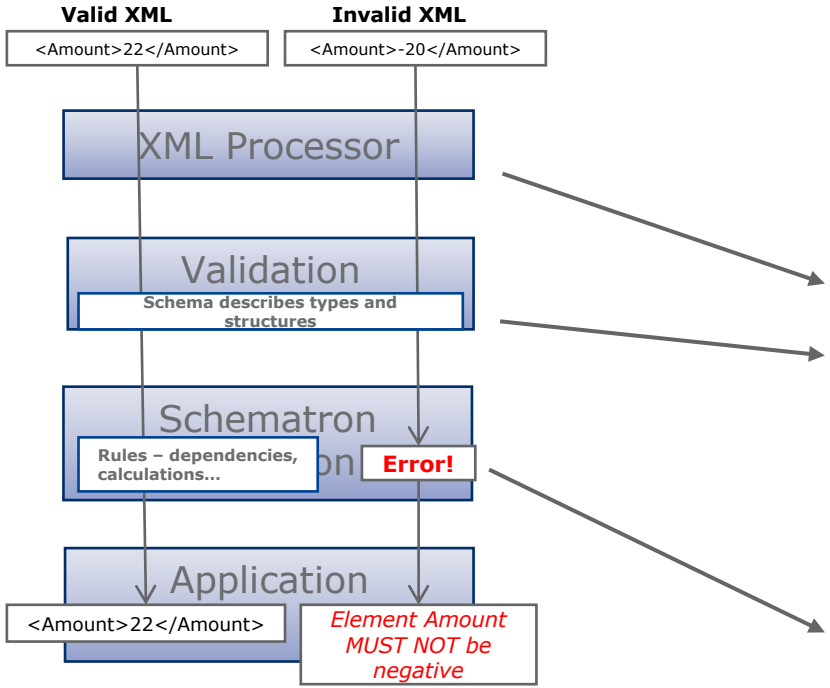
- Rules-oriented
- Conditions and relation between elements
- Advanced logic
- *Everything which isn’t explicitly forbidden is allowed!*

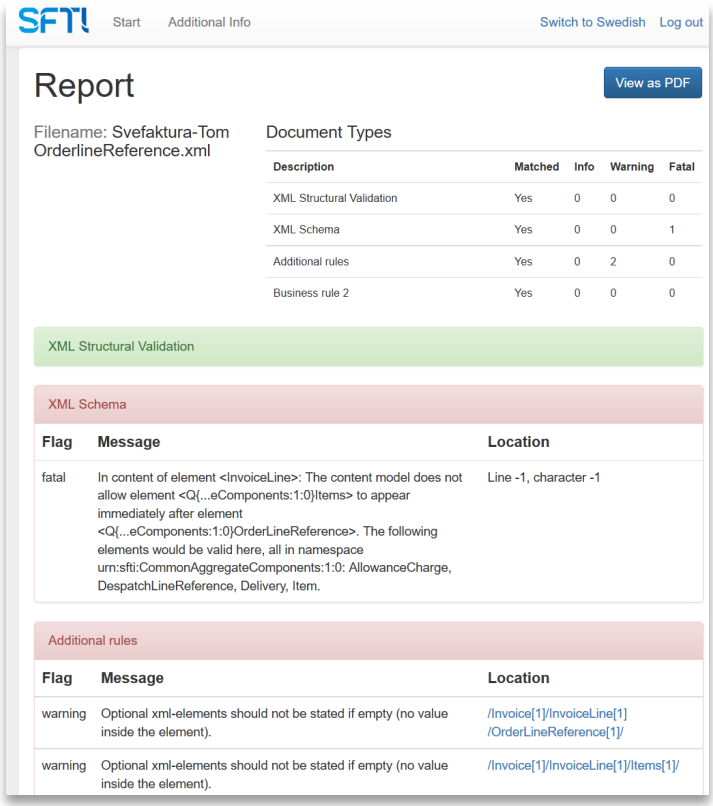
Interoperability and validation technology



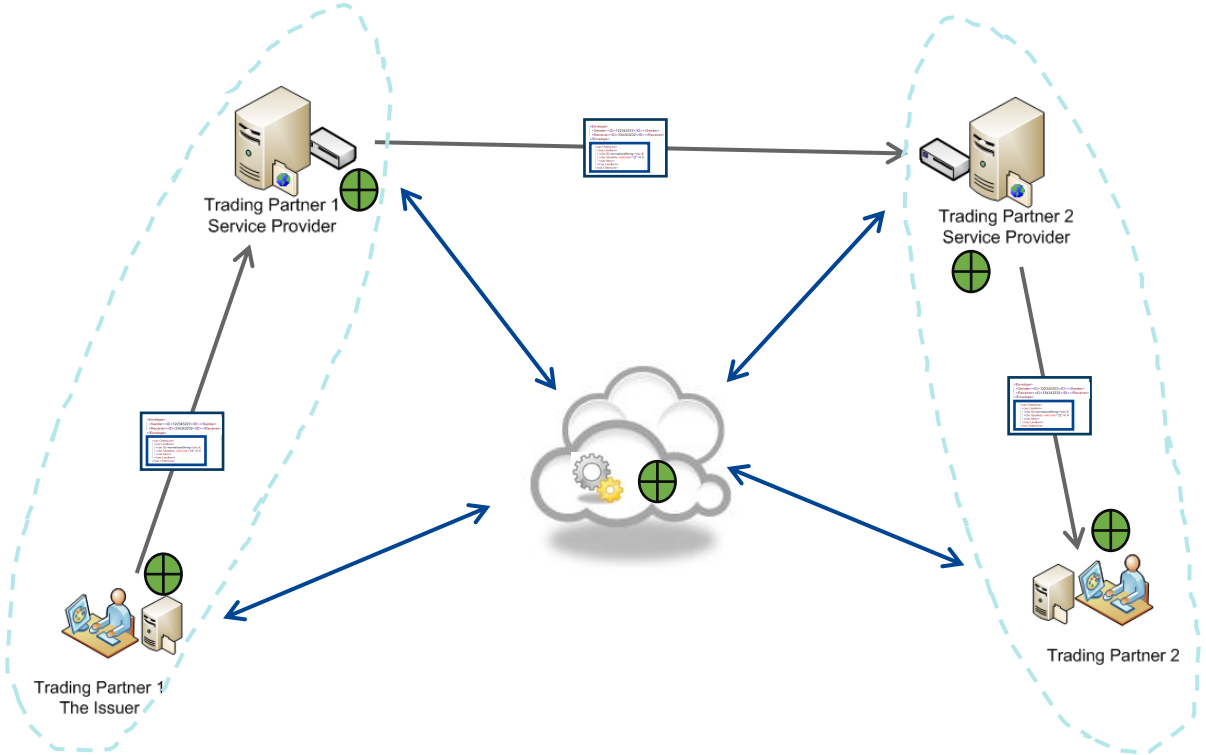


Validation services uses all levels of test artefacts





Who validates?



Question

Validation is a central function in the European standard. Are the service providers ready for the technology?

6 Usage specifications and compliance

Compliance – Usage Specifications

- The norm allows for (Core Invoice) Usage Specifications – CIUS
- A CIUS can be compared to an implementation guide
- A CIUS must be a true subset of the norm – meaning it must follow all business rules and can't add any terms not already defined (that would require an Extension)
- A CIUS can range from a simple restriction like
  - "The seller MUST provide a contract reference"
- To more complex specifications
  - Restrictions of cardinalities
  - Subset of codelists
  - Length restrictions of text elements

EN 16931-1:2017 Chapter 7

What is allowed to restrict in a Core Invoice Usage Specification

- ”Forbid” optional elements 0..n/0..1 ➔ 0..0
- Make definition narrower
- Add synonyms or explanatory text
- Make optional element mandatory
- Limit allowed number of repetitions
- Change data type to narrower representation (alphanumeric ➔ numeric)
- Limited allowed code values
- Add additional business rules or make existing more restrictive
- Restrict field lengths
- Require certain formatting on values
- Restrict number of decimals/fractions

IMPORTANT

An invoice which follows a CIUS MUST ALWAYS also be compliant towards the (non-restricted) norm.

EN 16931-1:2017 Chapter 7

Requirements for the contracting authorities/entities

From article 7

Receipt and processing of electronic invoices

Member States shall ensure that contracting authorities and contracting entities ***receive and process electronic invoices which comply with the European standard on electronic invoicing*** *whose reference has been published pursuant to Article 3(2) and with any of the syntaxes on the list published pursuant to Article 3(2).*

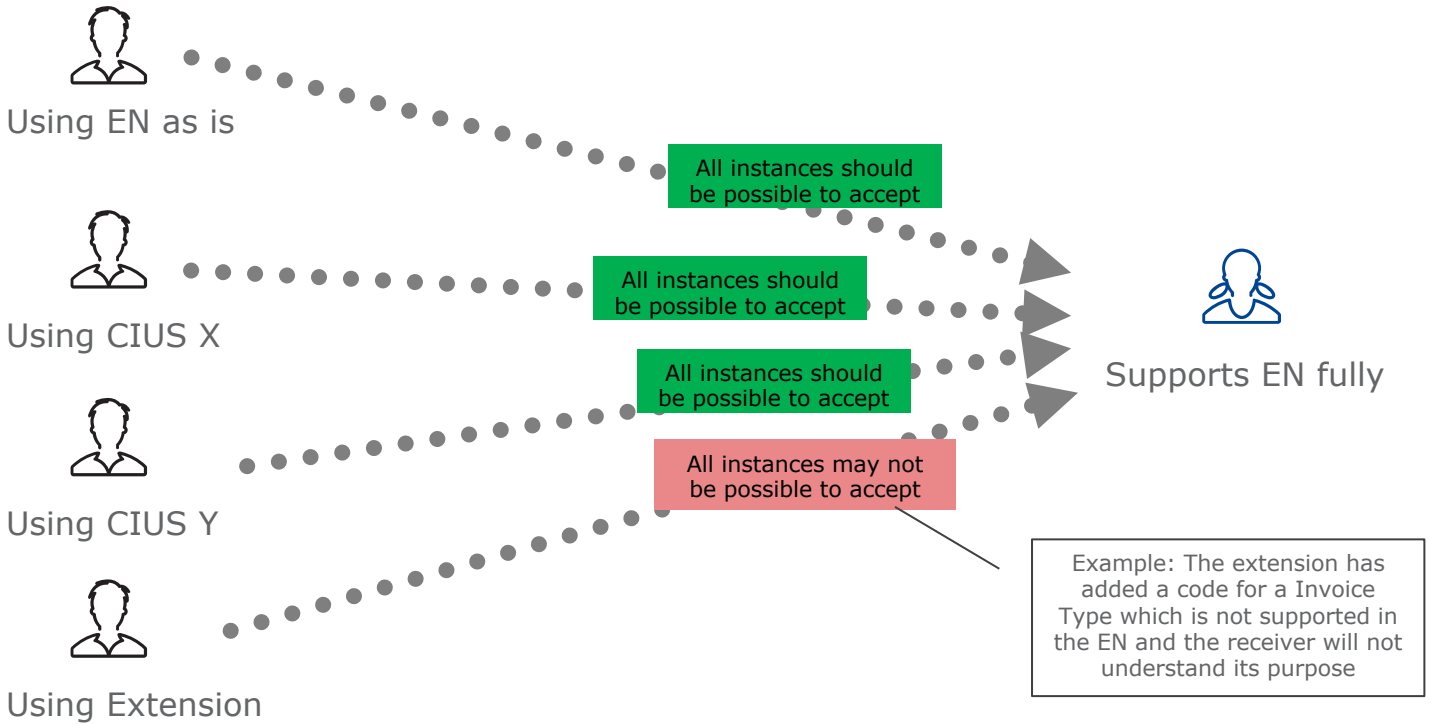
Claiming compliance towards the norm

Compliance of sending or receiving party

A receiving party may only claim compliance to the core invoice model if he accepts invoices that comply with the core invoice model in general, or with a CIUS, that is itself compliant with the core invoice model.

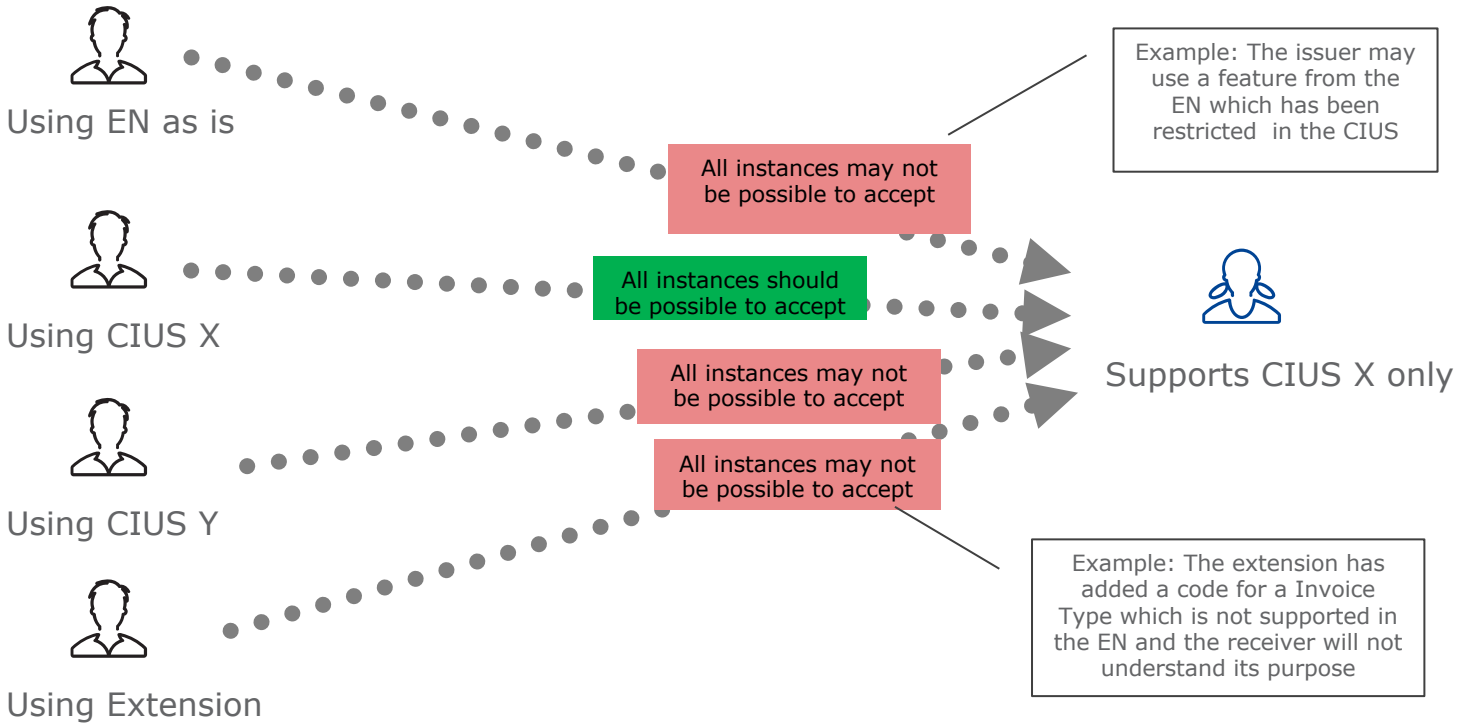
EN 16931-1:2017 Chapter 7

A few scenarios



Assuming the invoices are conformant against its specifcation (EN/CIUS/Extension)

A few more scenarios



Assuming the invoices are conformant against its specifcation (EN/CIUS/Extension)

Question

CIUS – benefits and challenges, what is your opinion?

Infrastructure in coherence with CEF eInvoicing

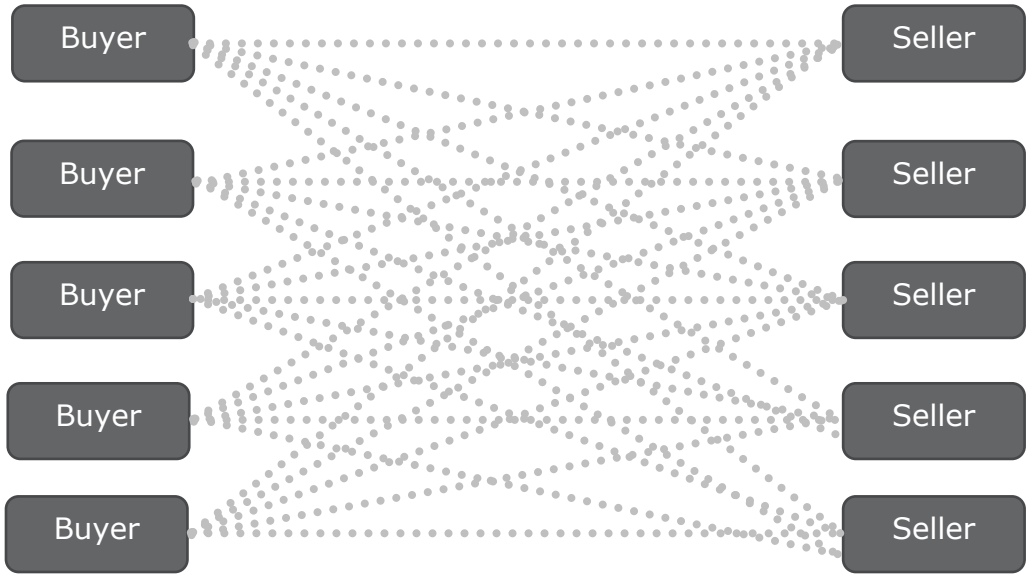
Christian Vindinge Rasmussen &
Martin Forsberg
DIGIT D3

Agenda

1. **A short introduction to the (former) challenges in electronic business**
2. **Different approaches on how to solve the issues (unsuccessfully)**
3. **The CEF eDelivery Discovery Model/PEPPOL approach**
4. **Consequences for the users**
5. **Scalability of the infrastructure**

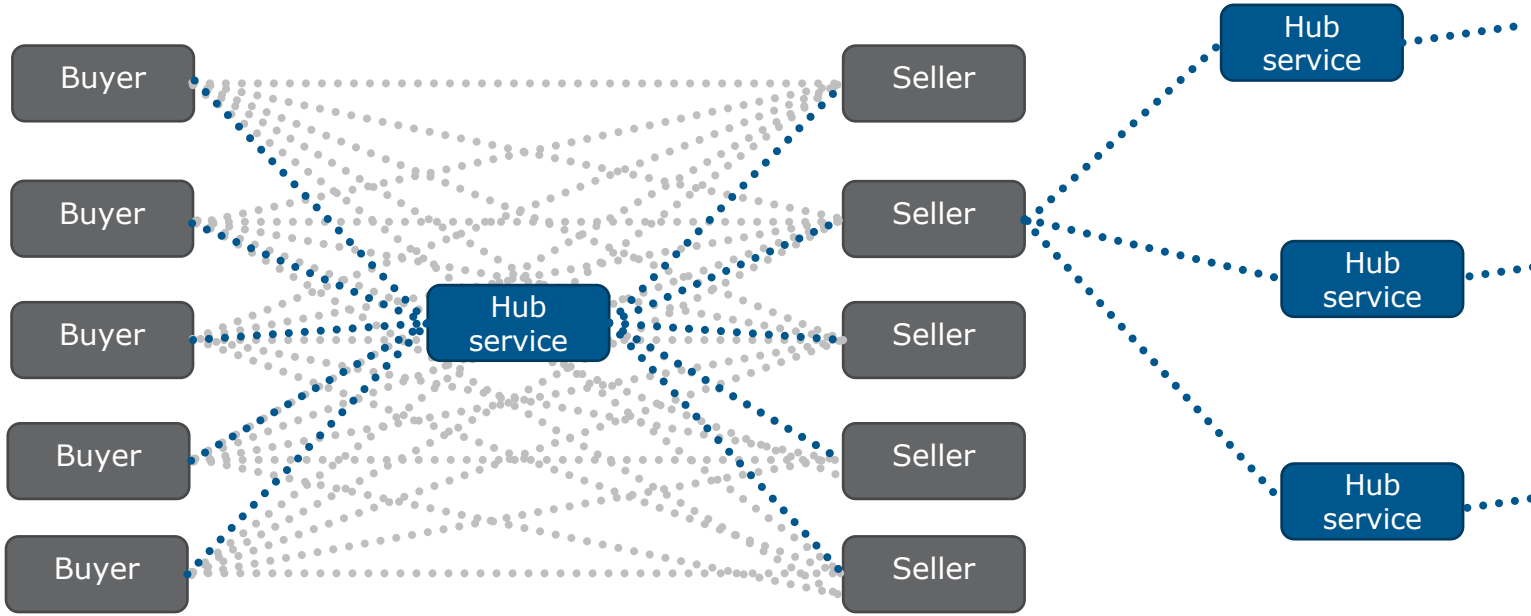
1 A short introduction to the (former) challenges in electronic business

How it used to work…



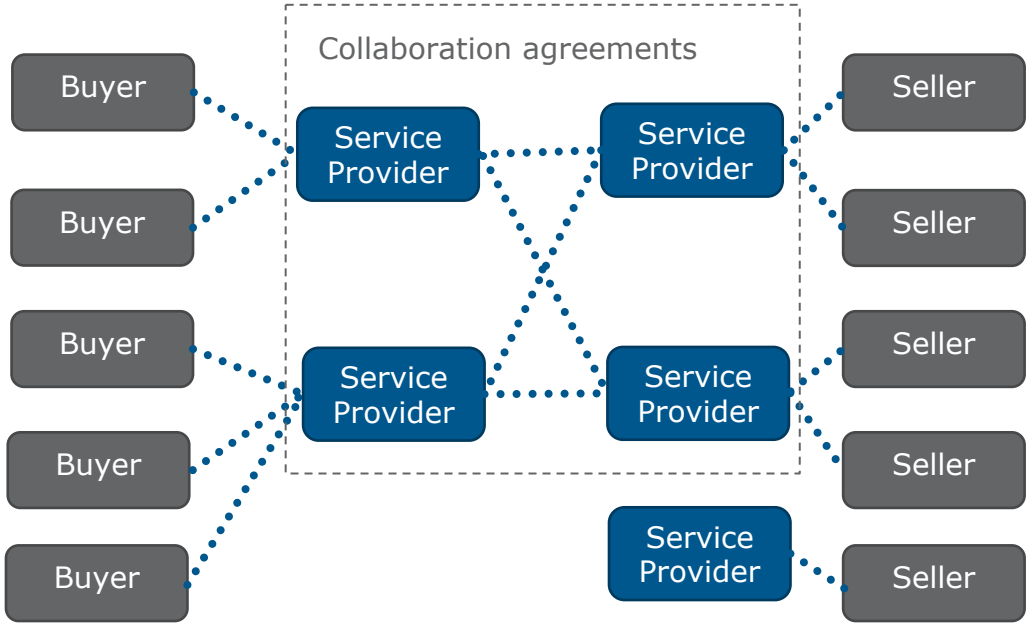
- Bilaterally agreed configuration of format, protocol, security
- In-house IT-solutions
- Each new connection => a project

How it used to work…



- Central hub takes care of the routing
- Buyer and seller becomes customers of the hub
- Business partners must use the same hub

How it used to work…



- Service providers acting on behalf of the buyer or seller
- Have collaboration-agreements defining SLA, technical details…
- End point (addressing)-information stored by the service provider or the issuer

Typical problems we see today as a result

- Complex process to connect new business partners
- Very costly to configure new connections
- Hard to know which format/standard is used for messages
- Almost impossible to connect cross-border in a rational way
- All service providers don’t collaborate
- Very costly to change service provider

2 Different approaches on how to solve the issues (unsuccessfully)

Attempts to solve the problems on routing/addressing in the 4-corner model

- Require the issuer to provide all the information to the service provider
- List of receivers in a file format shared/copied by all Service Providers
- Central database with all address-information

Common issues:

- Single point of failure
- Old information
- In-complete information
- Commercial trust-issues

3 The CEF eDelivery Discovery Model approach

PEPPOL – A deployment of CEF eDelivery DSI

AP

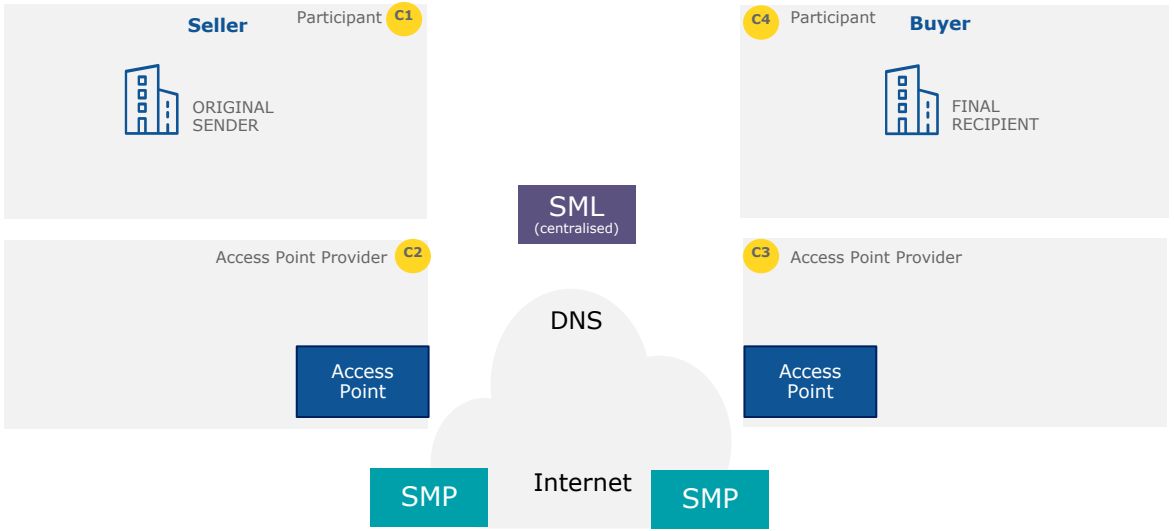
The role of the AP (Access Point) is to send and receive messages in a secure and reliable way, on behalf of the Participants. The AP is essentially a simple which is often offered together with other value added services by a Service Provider.

SML

The role of the SML (Service Metadata Locator) is to manage the resource records of the participants and SMPs (Service Metadata Publisher) in the DNS (Domain Name System). The SML is usually a centralised component in an eDelivery Messaging Infrastructure.

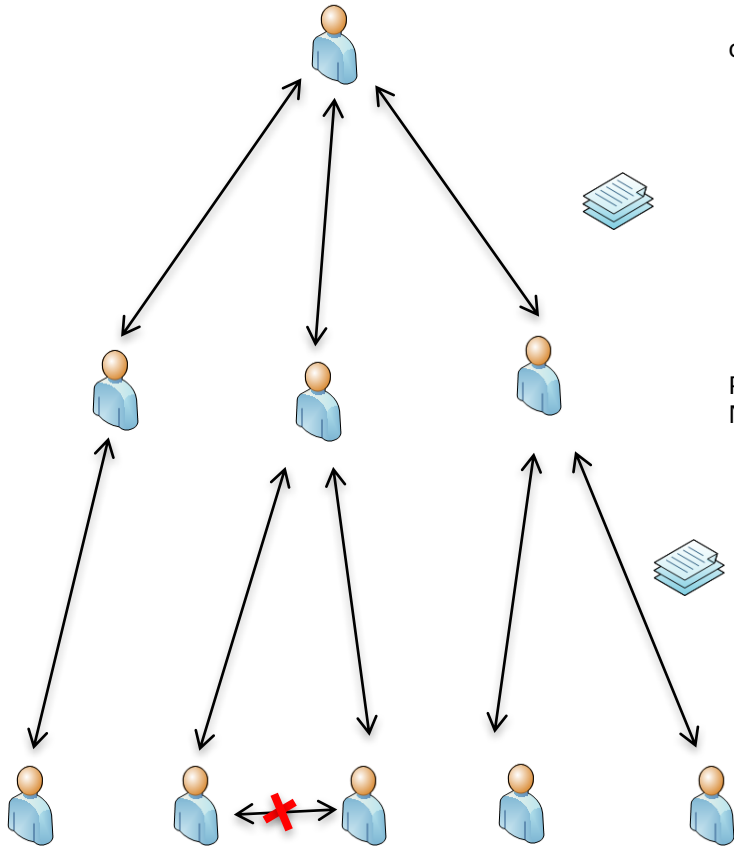
SMP

Once the sender discovers the address of the receiver's SMP, it is able to retrieve the needed information (i.e. metadata) about the receiver. With such information, the message can be sent. The SMP is usually a distributed component in an eDelivery Messaging Infrastructure.



Transport Infrastructure Agreements (TIA)

- The Access Point Provider and the Service Metadata Publisher Provider must sign a contract with openPEPPOL (or any of the PEPPOL Authorities)
- Agreements defines responsibilities, expectations, service levels and more
- Only providers who have signed the agreements can participate in the network (controlled by digital certificates on a communication level)



European Commission

Discovery models

Static

In a Static Service Location model the IP address and related attributes are static. The IP address of all the Access Points in the network are stored on a central location for the other Access Points to reference. To send a message, the sending Access Point looks a the static list of IP addresses on the networks' Domain Name System (DNS) to locate the Access Point of the receiver.

Dynamic

Dynamic Service Location enables the sending AP to dynamically discover the IP address and capabilities of the receiver. Instead of looking at a static list of IP addresses, the sender consults a **Service Metadata Publisher (SMP)** where information about every participant in the data exchange network is kept up to date. As at any point in time there can be several SMPs, every participant must be given a unique ID that must be published by **the Service Metadata Locator (SML)** on the network's Domain Name System (DNS). By knowing this URL, the sender is able to dynamically locate the right SMP and therefore the right receiver.

PROS & CONS

Static	Dynamic
+ High speed as there is no overhead processing	+ More automated and flexible
- Less flexible, change of irrelevant references	- Slower speed, as some overhead processing is required

Dynamic discovery in detail

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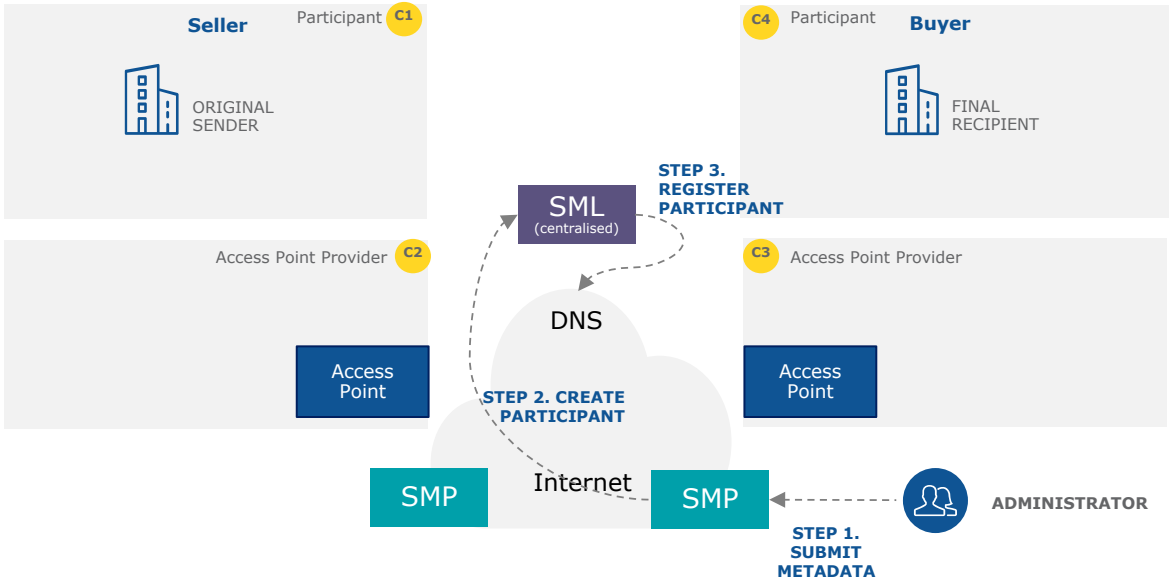
Phase 1: Registration



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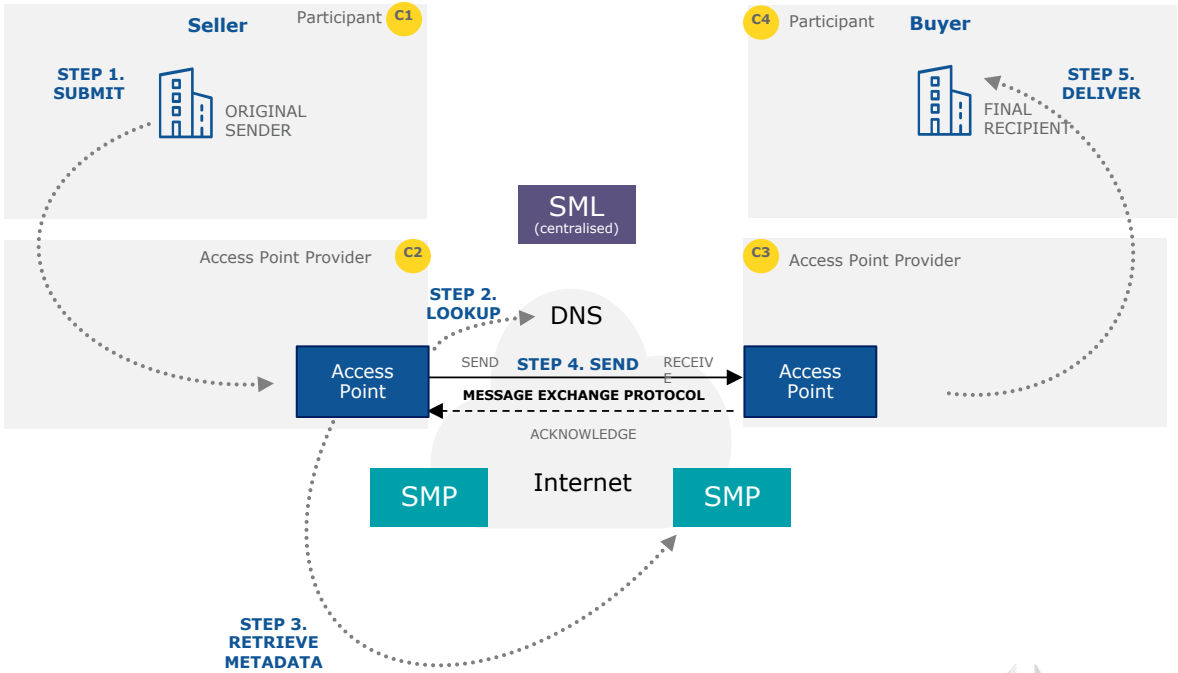


Service Metadata Example

```
<?xml version="1.0" encoding="UTF-8"?>
<ns3:SignedServiceMetadataType xmlns:ns3="http://busdox.org/serviceMetadata/publishing/1.0/" xmlns="http://busdox.org/transport/identifiers/1.0/" xmlns:ns2="htt
  <ns3:ServiceMetadata>
    <ns3:ServiceInformation>
      <ParticipantIdentifier scheme="iso6523-actorid-upis">0007:123412342</ParticipantIdentifier>
      <DocumentIdentifier scheme="busdox-docid-qns">urn:oasis:names:specification:ubl:schema:xsd:Order-2::Order##urn:www.cenbii.eu:transaction:biicoretrdm
      <ns3:ProcessList>
        <ns3:Process>
          <ProcessIdentifier scheme="cenbii-procid-ubl">urn:www.cenbii.eu:profile:bii03:ver1.0</ProcessIdentifier>
          <ns3:ServiceEndpointList>
            <ns3:Endpoint transportProfile="busdox-transport-start">
              <ns2:EndpointReference>
                <ns2:Address>https://82.99.4.199/busdox-transport-start-server/accesspointService</ns2:Address>
              </ns2:EndpointReference>
              <ns3:RequireBusinessLevelSignature>false</ns3:RequireBusinessLevelSignature>
              <ns3:MinimumAuthenticationLevel>1</ns3:MinimumAuthenticationLevel>
              <ns3:ServiceActivationDate>2010-12-18Z</ns3:ServiceActivationDate>
              <ns3:ServiceExpirationDate>2012-12-31Z</ns3:ServiceExpirationDate>
```

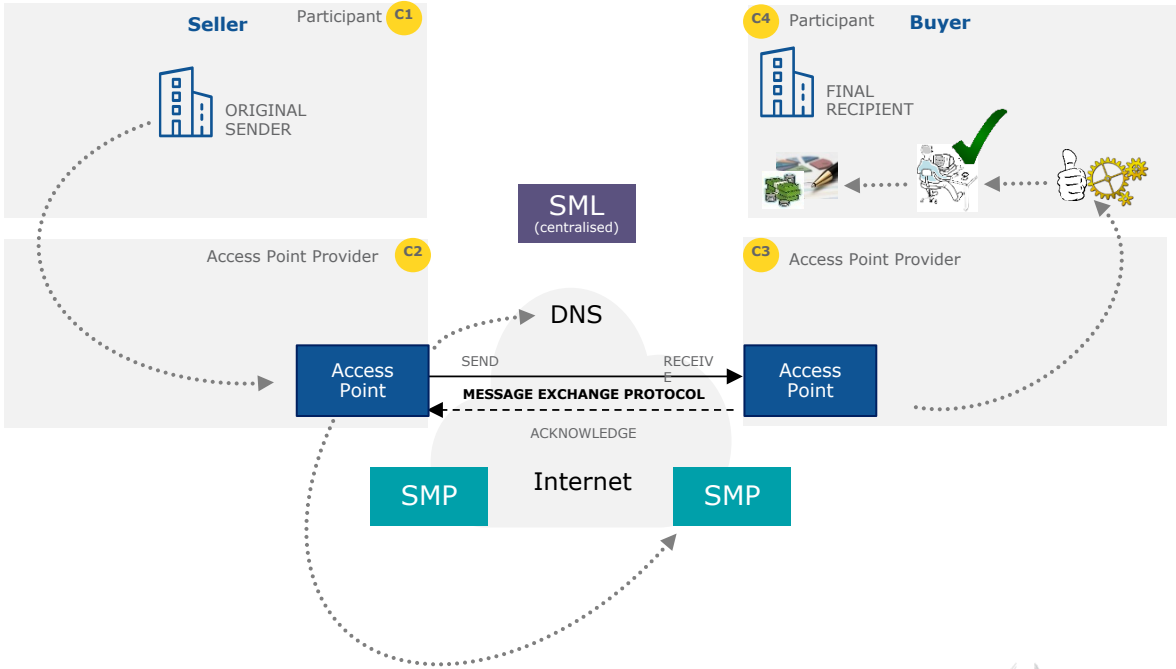
- The Participant's identifier
- Type of supported message
- Type of message
- Type of transport protocol to use for this message
- Technical endpoint/address for where the message should be sent

4 Consequences for the users

Consequences for the users

- A participant registered in the PEPPOL Infrastructure is visible as a receiver by everybody. The SML/SMP is open for queries.
- Only certified and approved Access points can send messages in the infrastructure
- Receiving Access points are not allowed to refuse an incoming message if it comes from a certified Access point
- Participants must implement routines for handling new connections!

Scenario - Known business partner



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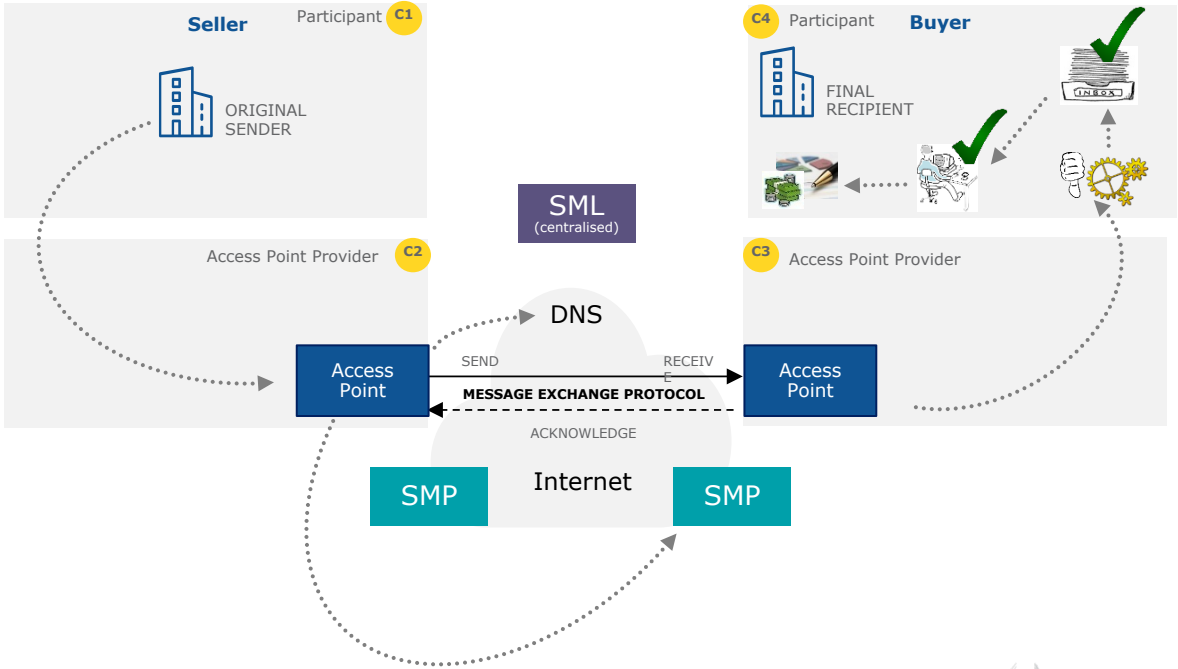
Scenario – Unknown business partner

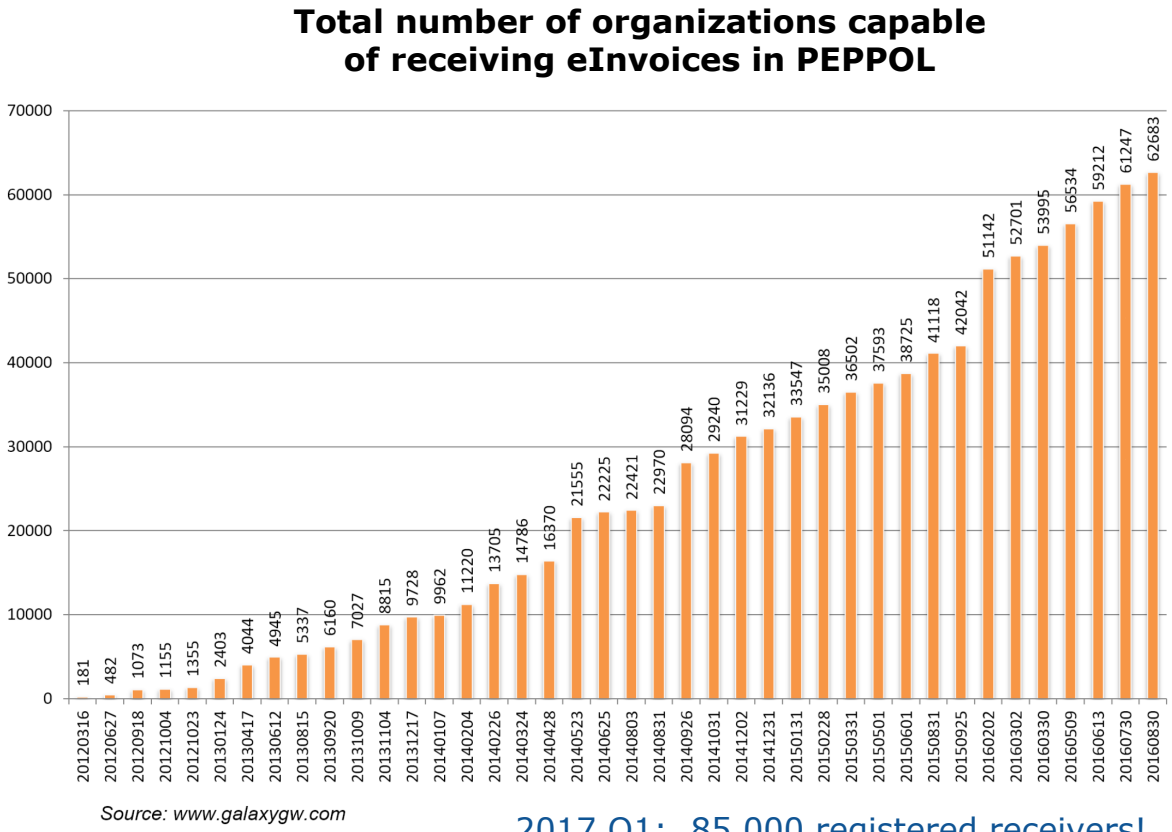


5 Scalability of the infrastructure

Scalability of the infrastructure

The discovery mechanism is using DNS, well known for stability and performance

The only central service, the SML, is for administration of the participants, not the message flow itself



Source: www.galaxygw.com

2017 Q1: 85.000 registered receivers!
2017 Q3: 100.000 registered receivers!

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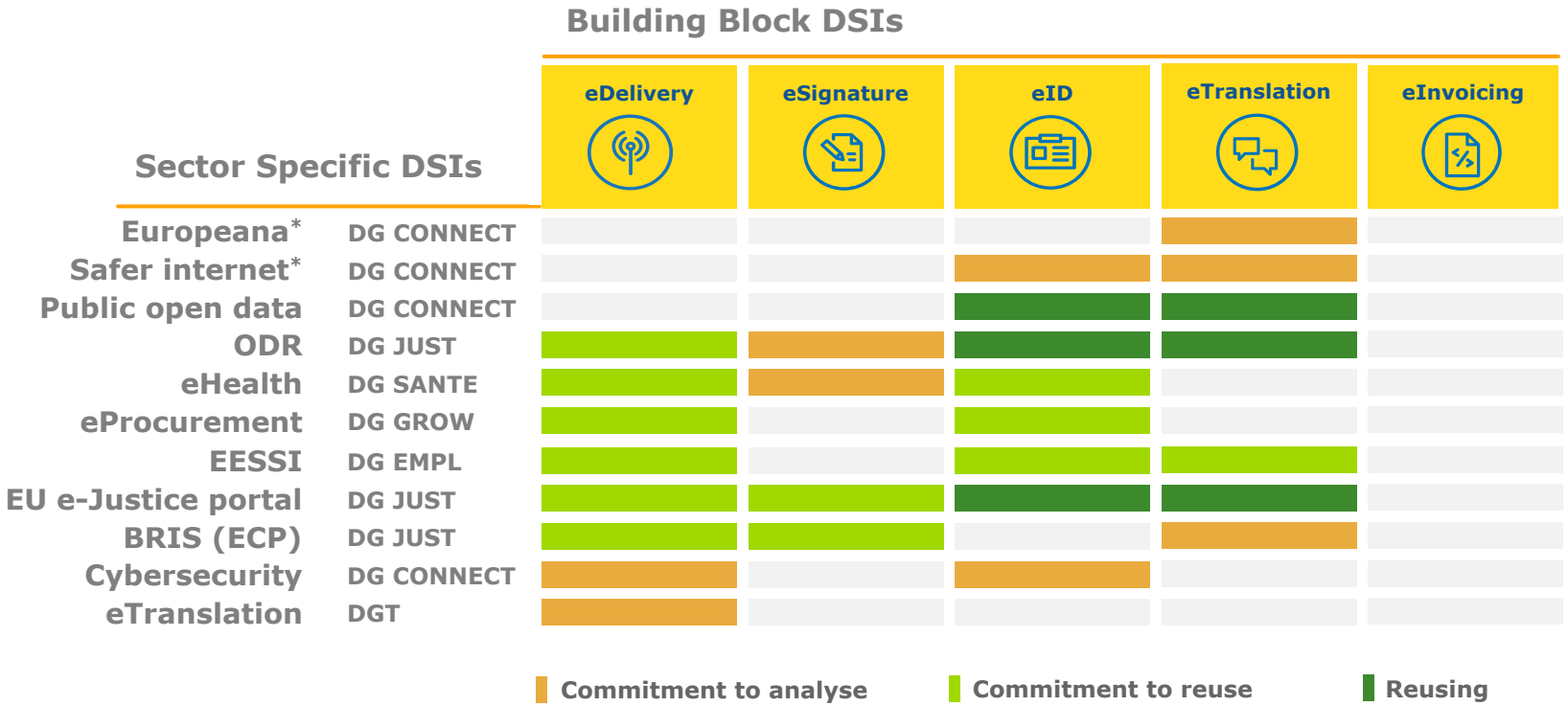
CEF eDelivery is not a one-size fits all solution

SCOPE OF CEF eDELIVERY

		PEPPOL	e-CODEX	**Your** CEF eDelivery implementation
EXCHANGE MODEL	TOPOLOGY	4-corner model	4-corner model	**Your** choice
	PROTOCOL	PEPPOL AS2 profile	e-SENS AS4 profile	e-SENS AS4 profile recommended
	INTEGRATION APPROACH	Service Providers (Market)	Specific Connector	**Your** choice
DISCOVERY MODEL		Dynamic	Static	**Your** choice
SECURITY MODEL	TRUST CIRCLE	PKI	Mutual trust	**Your** choice
	SECURITY CONTROL	Liberal inner security	Inner security with connector	**Your** choice

Reuse of building blocks by **CEF's sectorial projects**



* Projects run together with Member States through grants provided by CEF.

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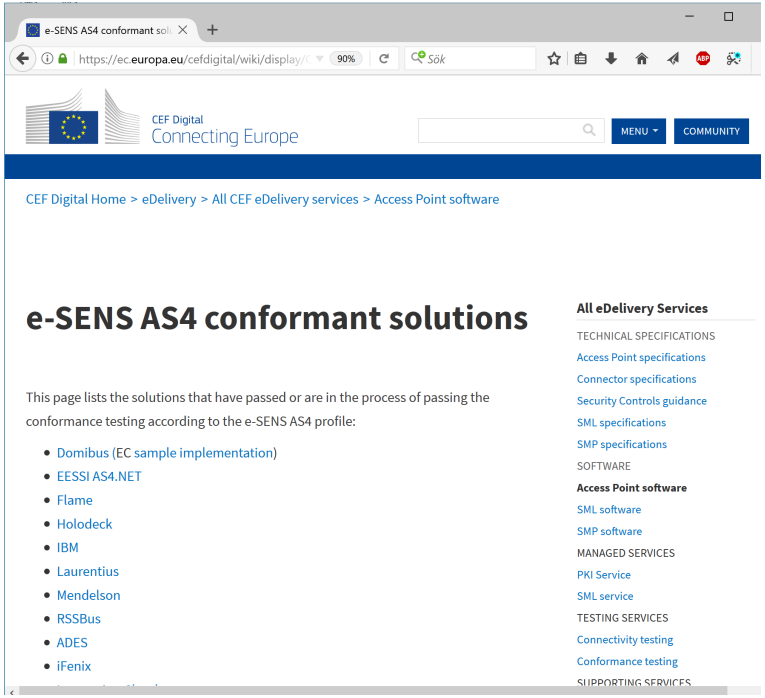
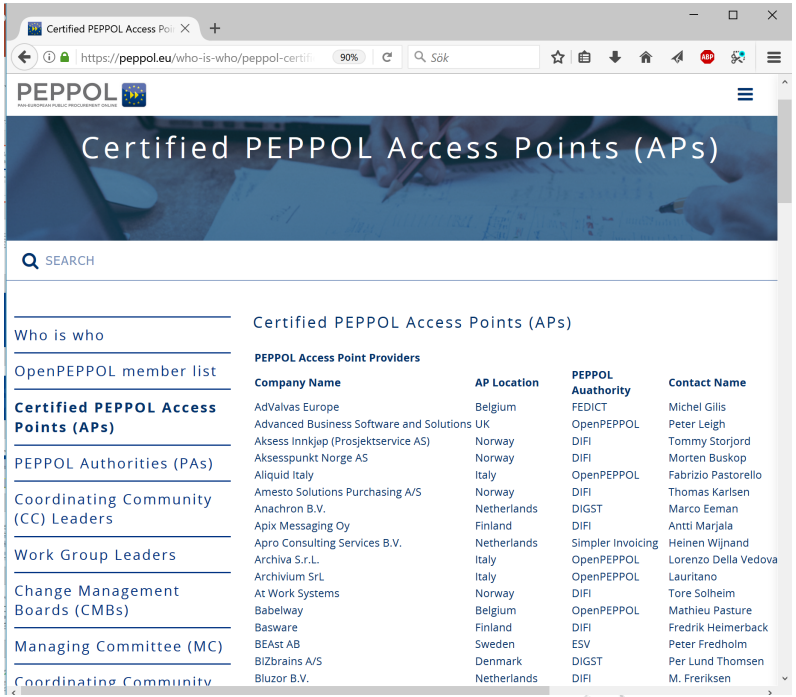
Open Source Implementations of CEF eDelivery and Certified PEPPOL Access Point Providers





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Summary

- Automatic discovery is necessary for mass-use of electronic business
- A common collaboration agreement and security structure
- The service metadata contains all you need to know to dynamically connect and exchange messages
- Necessary to implement routines for handling new business partners
- No roaming fees or discrimination of participants allowed
- Standardized specification

Question
Is CEF eDelivery/PEPPOL relevant for you?

Funding and grants:

CEF Telecom: 2017-3 eInvoicing call & evaluation process

Christian Vindinge Rasmussen

DIGIT D3

2017 CEF Telecom calls

Call	Indicative budget	Launch date	Deadline
CEF-TC-2017-1 **BRIS** **EESSI** **eID & eSignature** **European e-Justice Portal**	€2 million €17 million €7 million €1.5 million	17 February 2017	18 May 2017
CEF-TC-2017-2 **Cyber Security** **eDelivery** **eHealth** **eProcurement**	€12 million €0.5 million €9 million €4 million	6 May 2017	21 September 2017
CEF-TC-2017-3 **eInvoicing** **eTranslation** **Europeana** **Public Open Data**	**€10 million** €6 million €2 million €6 million	28 June 2017	28 November 2017

2017-3 eInvoicing call
(2017 Work Programme - section 3.4)

2017-3 eInvoicing call	
Launch date	28 June 2017
Deadline	28 November 2017
Who can apply?/Consortium composition	Minimum 2 private or public entities from one or several Member States
Budget	€10 million
Co-financing	75% of the eligible costs
Indicative duration	12 months

2017-3 eInvoicing call: scope

Proposals must meet objective 1 or 2:

1. Uptake of eInvoicing solutions compliant with the EN and its ancillary deliverables by public entities

2. Update of eInvoicing solutions compliant with the EN and its ancillary deliverables by solution providers and public authorities

Promotion of eDelivery:

Deployment of the eDelivery Building Block or use of eDelivery through a service provider

- Must be carried out in conjunction with objective 1 or 2

2017-3 eInvoicing call:
expected outcomes

Increased uptake and use of eInvoicing by public authorities (especially regional/local) in meeting the requirements of the eInvoicing Directive

Support for service providers in making their existing solutions compliant with the requirements of the eInvoicing Directive

Past eInvoicing calls

2015-1 eInvoicing call

Call opening: 15 September 2015 - Call closure: 11 February 2016

Call objective:

Increase uptake and the use of the eInvoicing DSI by supporting authorities – especially at the regional and local levels – in meeting the requirements of the eInvoicing Directive

Overall indicative budget: €7 million

Co-funding rate: 75% of eligible costs

- **Proposals received: 10**
- **Eligible proposals received: 8**
- **Grant agreements: 8**

Maximum EU contribution: €4,426,111

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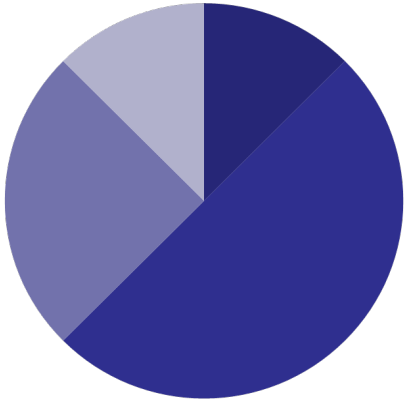
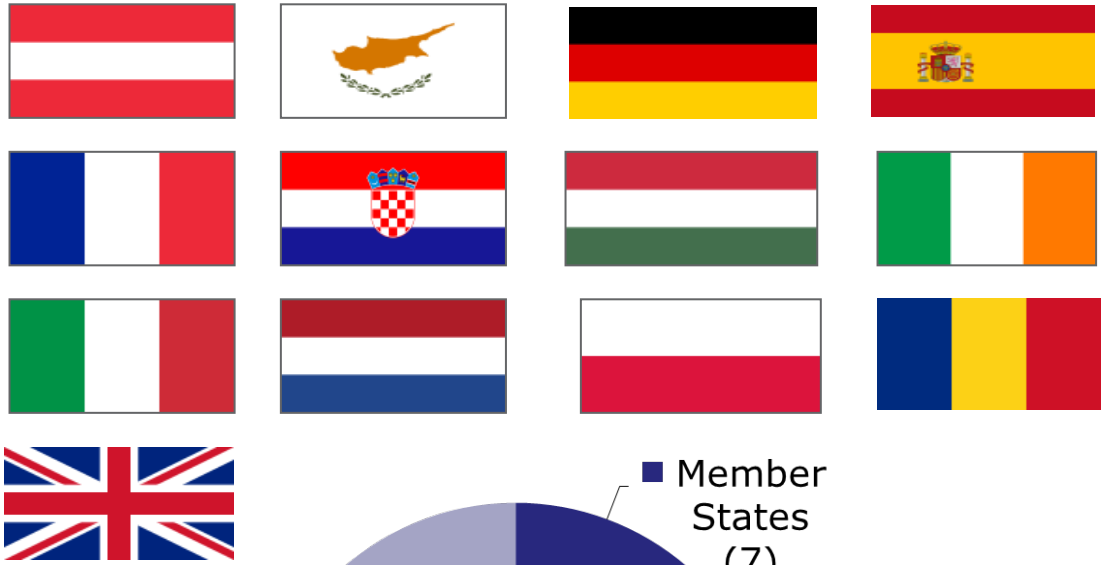
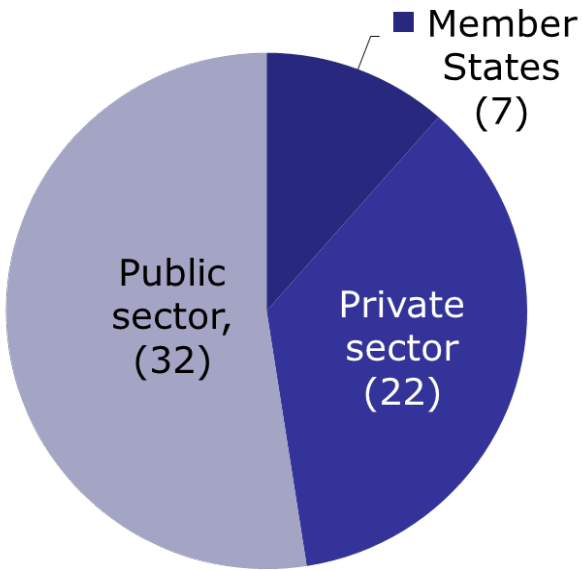
2015-1 eInvoicing call:
Member States involved (13)



- 5 members (1 consortium)
- 6 members (4 consortia)
- 7 members (2 consortia)
- 8 or more members (1 consortium)





2015-1 eInvoicing call

1 action already completed

7 actions on-going (all aiming to implement European eInvoicing standard), supporting:

- Solution providers (AT - ecasio, ES - EDICOM, UK - ELCOM) in upgrading their solution to the eInvoicing standard + supporting users of the solutions
- Uptake and upgrade of national eInvoicing platforms (CY, HR, ES, IT)
- Tool for eInvoicing format mapping (NL, DE)

2016-3 eInvoicing call

Call opening: 13 September 2016 - Call closure: 15 December 2016

Call objective:

Increase uptake and the use of the eInvoicing DSI by supporting authorities – especially at the regional and local levels – in meeting the requirements of the eInvoicing Directive

Overall indicative budget: €7 million

Co-funding rate: 75% of eligible costs

- **Proposals received: 21**
- **Eligible proposals received: 20**
- **Recommended proposals: 15**

Recommended funding: €10,401,818

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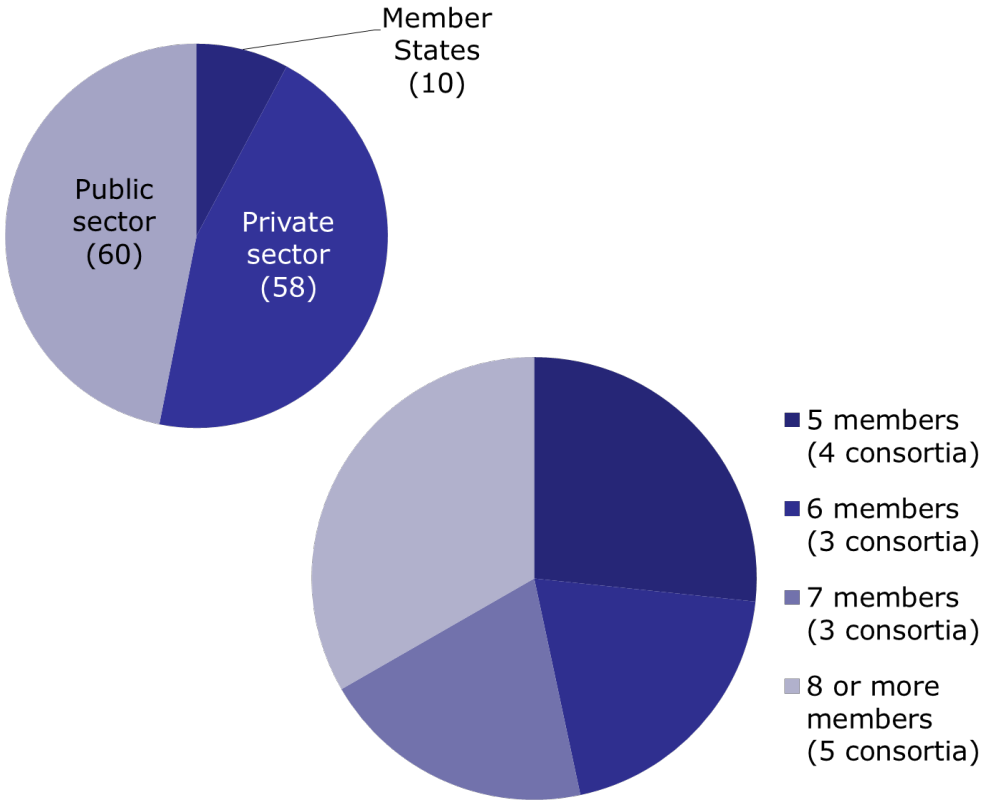
2016-3 eInvoicing call
Member States involved (22)



2016-3 eInvoicing call

Info below still indicative: grant agreement preparation now on-going (to be finalised by mid-September)

Most of the actions to start between May and September 2017 and run until end of 2018

- All will ensure the compliance with the European eInvoicing standard
- Most will also deploy eDelivery

Actions will support:

- Solution providers and national eInvoicing solutions, including at the local level, to make them complaint with eInvoicing standard
- Strong focus of some of the actions on onboarding suppliers and engaging with SMEs

How to apply:

READ all call documentation, forms, Guide for Applicants, FAQs, call webpage

REFLECT on the call content & requirements

REMEMBER that successful applications take time and effort, but guidance is available!

CEF Telecom calls:
for more information

inea-cef-telecom-calls@ec.europa.eu

https://ec.europa.eu/inea/en/connecting-europe-facility/cef-telecom/apply-funding/2017-cef-telecom-calls-proposals

@inea_eu

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Question

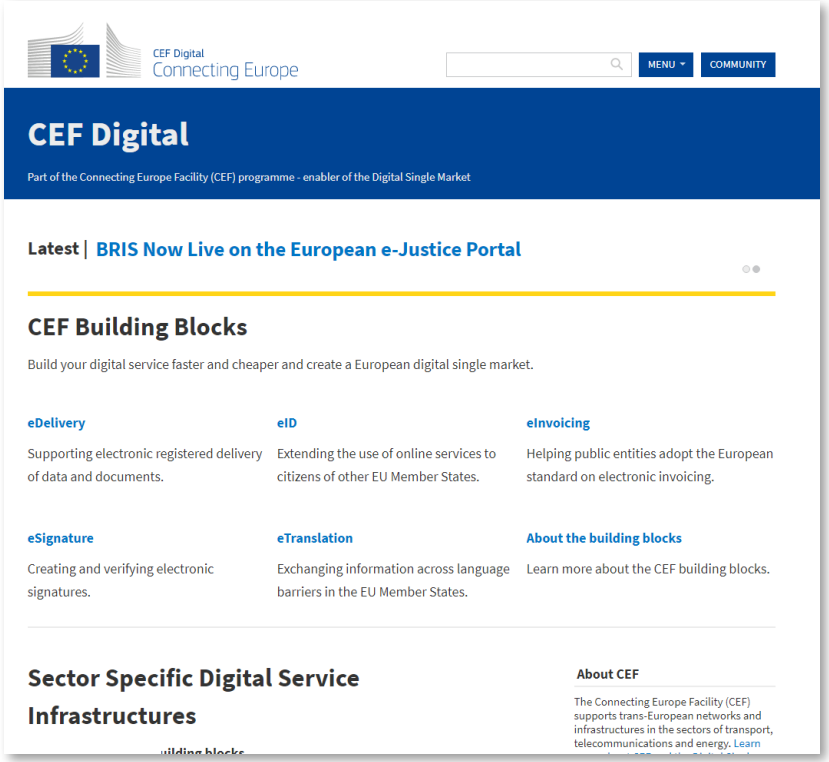
Has anyone here applied earlier or intending to do so in this years call?

Discussion

#ConnectingEurope

Find out more on CEF Digital

ec.europa.eu/cefdigital



Contact us

CEF-BUILDING-BLOCKS@ec.europa.eu

Thanks!