



---

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

09 <sup>20</sup>	Welcome & Introduction	Christian Rasmussen, DIGIT D3
	CEF eInvoicing and our services	Christian Rasmussen, DIGIT D3
	Introduction to eInvoicing the European Standard and its legal background	Martin Forsberg, DIGIT D3
11 <sup>00</sup>	Coffee break	
11 <sup>30</sup>	Infrastructure in coherence with CEF eInvoicing	Christian Rasmussen, DIGIT D3 Martin Forsberg, DIGIT D3
	Early adopters – best practices	Christian Rasmussen, DIGIT D3 Martin Forsberg, DIGIT D3
	Funding & Grants for CEF eInvoicing	Christian Rasmussen, DIGIT D3
	Discussion	All
14 <sup>30</sup>	Close	

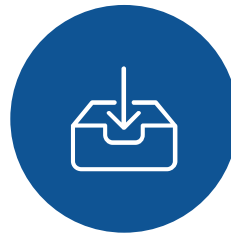
---

# Highlights of the workshop

## DURING

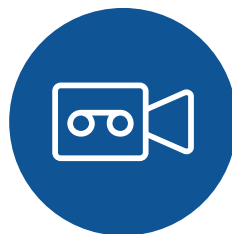


Ask questions



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 and its legal background
- **Validation** and its benefits
- Experience from **early adopters of eInvoicing**
- **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?



**TRANSPORT**  
€26.25bn

**TELECOM**

**Digital Service Infrastructures**  
€970 M \*

**Broadband**  
€170 M

**ENERGY**  
€5.85bn

## 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).

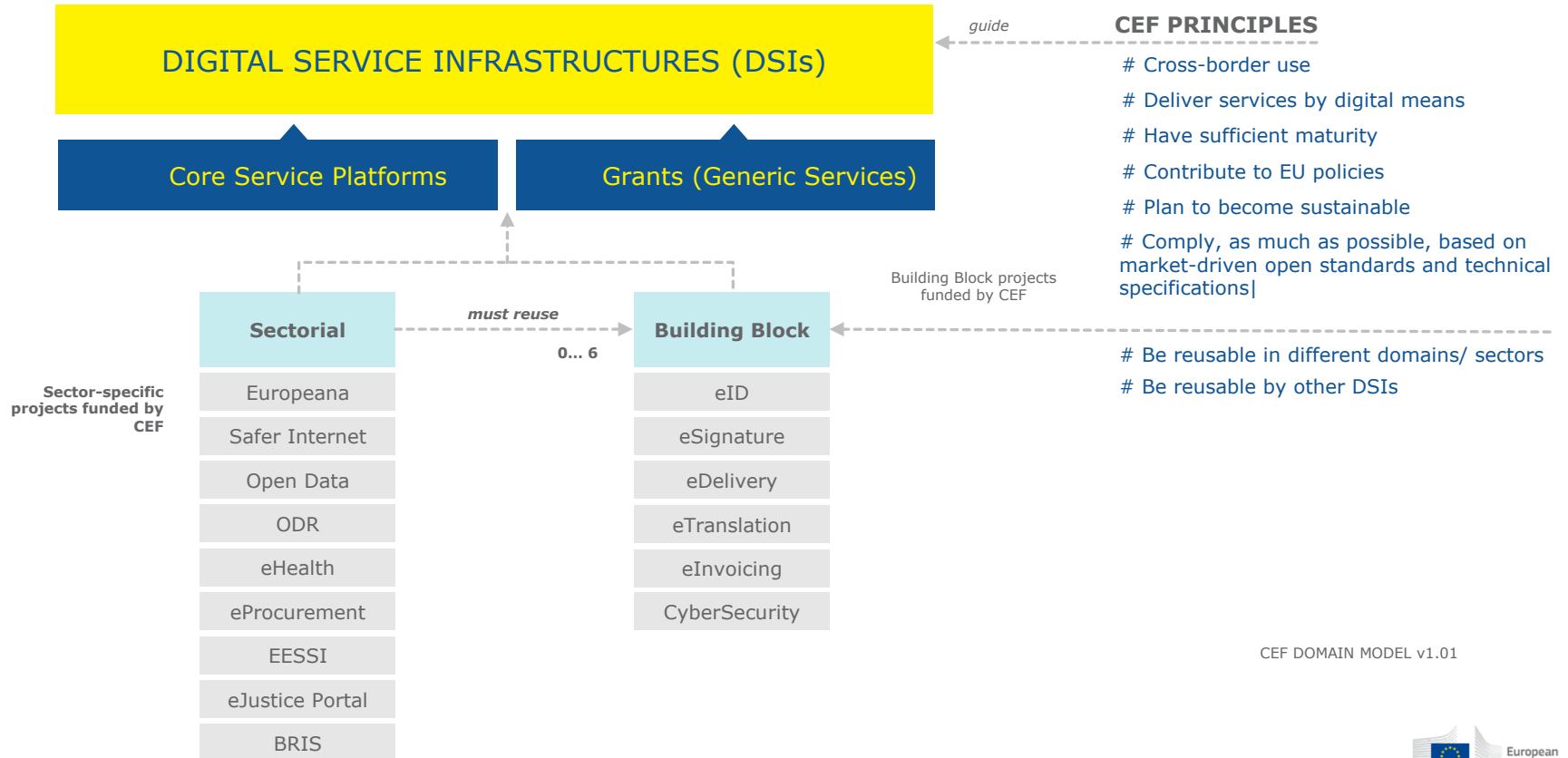
### CEF Work Programmes

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

\* - 100 M Juncker Package



# What are Digital Service Infrastructures?



(\*) 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



eJustice

ODR

Open Data

BRIS

EESSI, etc.

## CORE SERVICE PLATFORMS

Services offered by the  
European Commission



**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”



The screenshot shows the PEPPOL website homepage. At the top left is the PEPPOL logo with the tagline 'PAN-EUROPEAN PUBLIC PROCUREMENT ONLINE' and the European Union flag. To the right are navigation links: 'About OpenPEPPOL', 'What is PEPPOL?', and 'Get involved'. Below the navigation is a large blue banner with the text 'Making procurement' in large white letters, followed by 'PEPPOL enables businesses across Europe to connect with public buyers in various stages of the procurement process'. Below the banner is a white search bar with a magnifying glass icon and the word 'SEARCH'. At the bottom of the banner are two buttons: 'Learn more' and 'Already a member'. In the bottom right corner of the page is the European Commission logo.

**PEPPOL** PAN-EUROPEAN PUBLIC PROCUREMENT ONLINE  [About OpenPEPPOL](#) [What is PEPPOL?](#) [Get involved](#)

## Making procurement

PEPPOL enables businesses across Europe to connect with public buyers in various stages of the procurement process

[Learn more](#) [Already a member](#)

 European Commission

---

## Background and history of CEF eInvoicing – eSENS.eu



*moving  
services  
forward*★.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...



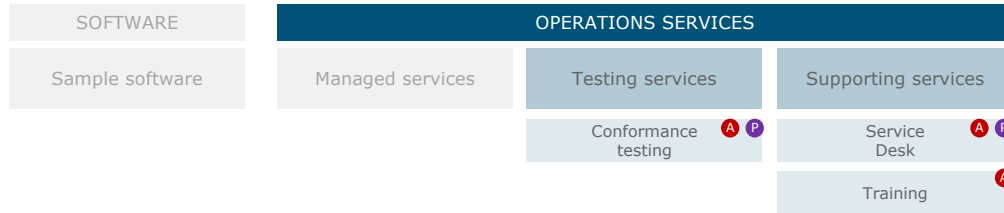
3

## Our services

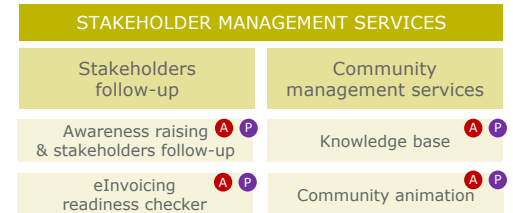


# CEF eInvoicing Service Offering

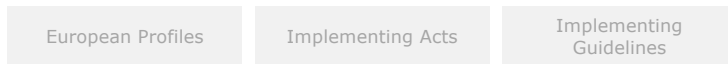
## ENABLING SERVICES *enable the adoption of the core services*



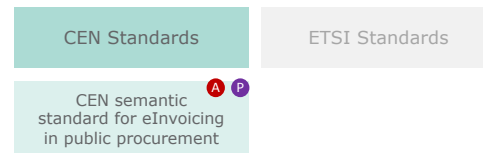
## ENHANCING SERVICES *enhance customer experience*



## TECHNICAL SPECIFICATIONS



## STANDARDS OF ESOs




## CORE SERVICES *facilitate cross-border/ cross-sector technical interoperability among heterogeneous information systems*

AUDIENCE

- <sup>A</sup> Public Administrations
- <sup>P</sup> Solution Providers

# 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

The screenshot displays the eInvoicing Readiness Checker website. At the top, there is a navigation bar with the CEF Digital logo and the text 'European Commission > CEF Digital > eInvoicing > Readiness Checker'. A search bar is located in the top right corner. Below the navigation bar, the main heading 'eInvoicing Readiness Checker' is prominently displayed. A secondary navigation menu includes links for 'Home', 'Take the test', 'Find a Public Entity', 'Find a Solution & Service Provider', and 'Countries', along with a 'Login to the Readiness Checker' button. The main content area is divided into three columns: 'About', 'Public Entities', and 'Solution & Service Providers'. The 'About' section provides a brief overview of the tool's purpose. The 'Public Entities' section features a building icon and asks 'Is your administration ready for eInvoicing?', with a 'Take the test' button. The 'Solution & Service Providers' section features a person icon and asks 'Can you offer eInvoicing solutions that Public Entities need?', with a 'Create a profile' button. A 'Download User Manual' button is also present in the 'About' section. At the bottom, a dark banner contains three icons representing 'Public Entities', 'Solution & Service Providers', and 'Countries'.

Support [en](#) English

European Commission > CEF Digital > eInvoicing > Readiness Checker

## eInvoicing Readiness Checker

[Home](#) [Take the test](#) [Find a Public Entity](#) [Find a Solution & Service Provider](#) [Countries](#) [Login to the Readiness Checker](#)

### About

The eInvoicing Readiness Checker helps Public Entities assess their readiness status in accordance to the compliance of the EU Directive 2014/55/EU and enables Solution & Service Providers to present their eInvoicing software products and services.

[Download User Manual](#)

### Public Entities

Is your administration ready for eInvoicing?

[Take the test](#)

### Solution & Service Providers

Can you offer eInvoicing solutions that Public Entities need?

[Create a profile](#)

[Public Entities](#) [Solution & Service Providers](#) [Countries](#)

# eInvoicing User Community

CEF DIGITAL

## eINVOICING USER COMMUNITY

### FORUM

The CEF eInvoicing User Community **Forums** are a great place to post questions and share comments with fellow eInvoicing users, implementors and Service and Solution providers. Discuss a variety of topics, from implementing Directive 2014/55/EU to promoting the adoption of eInvoicing solutions.

Topic	Author	Creation date	
Implementations of the new European Norm in the Member States - What is your plans?	@Christian Vindinge RASMUSSEN	31-05-2017	🗨️ 3 🍌 2
Webinar # 1: CEF eInvoicing - What's in it for you?	@Ines COSTA	📅 08 May 2017	
CEF eInvoicing Implementation Workshops - register now!	@Ines COSTA	📅 02 May 2017	🗨️ 2
Standard Definitions for Techniques of Supply Chain Finance	@José VICENTE	📅 18 Apr 2017	
ZUGFeRD Developers meet in May 2017	@Stefan ENGEL-FLECHSIG	📅 20 Mar 2017	🗨️ 1 🍌 3

Prev 1 2 Next

[Visit Forum](#)

[Create new topic](#)

### CONTRIBUTE

The objective of the **Contribute** section in the CEF eInvoicing User Community is to allow eInvoicing stakeholders to participate in ongoing activities launched by CEF eInvoicing by providing information, feedback, comments or taking action in a different range of initiatives.

Title	Excerpt	Status	Deadline	
2016 eInvoicing Country Sheets	As national representatives you are asked to verify the eInvoicing situation in your country.	COMPLETED	📅 31 Dec 2016	🍌 4
2017 State of Play of B2G eInvoicing: Participate in an online survey	Participate in an online survey to help us to obtain input on the state of play of your country's B2G eInvoicing in public procurement	OPEN	Ongoing	
eInvoicing Pioneer Group	Are you active in eInvoicing from the public or private sector side? Join this group to provide feedback to the EC on eInvoicing matters and to drive activities to support the launch of the <a href="#">European Standard on eInvoicing</a> and compliance with <a href="#">Directive 2014/55/EU</a> .	OPEN	Ongoing	🗨️ 1 🍌 6
2017 State of Play of B2G eInvoicing: Bring your contribution!	Define what questions should be address in the state of play of B2G eInvoicing in public procurement study, and who should be invited to answer the questions.	COMPLETED	📅 28 Feb 2017	🗨️ 13 🍌 4
The future mandate of the forum	As the current European Multi-Stakeholder Forum on eInvoicing (EMSFEI) mandate is coming to an end, we warmly invite you to play an active role in the definition of the future mandate of this forum.	COMPLETED	📅 15 Feb 2017	🗨️ 1 🍌 1

### About the community

The eInvoicing User Community space enables stakeholders involved and interested in cross-border eInvoicing, to discuss eInvoicing in the EU public and private sectors. The space is also used for co-creative activities with the Advisory Group and Early Adopters of the upcoming eInvoicing Match-Making Website, which is designed to help public administrations implement electronic eInvoicing, as per the requirements of Directive 2014/55/EU.

#### Your space moderators



---

# 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](mailto: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

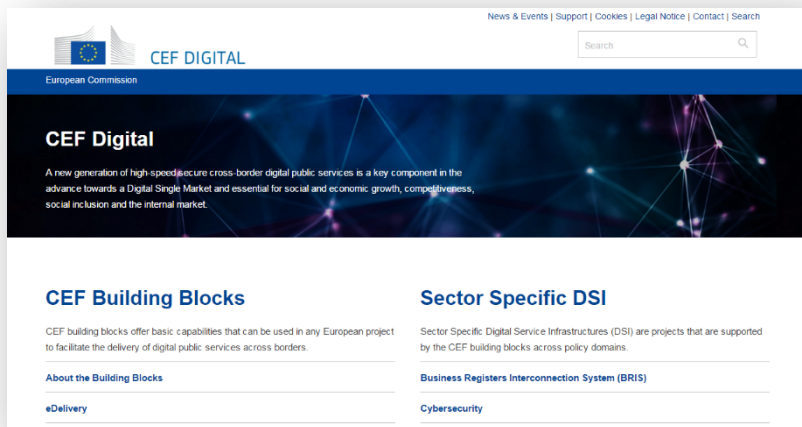
- About 1 hour-long sessions with core elements from on-site and remote trainings to gain expertise in key areas.

A decorative graphic consisting of three overlapping squares. The top square is light blue, the middle one is a slightly darker blue, and the bottom one is white. The number '4' is centered on the white square.

4

## How to get started

## Interested to find out more?



The screenshot shows the CEF Digital website homepage. At the top, there is a navigation bar with links for 'News & Events', 'Support', 'Cookies', 'Legal Notice', 'Contact', and 'Search'. The CEF Digital logo is prominently displayed on the left, with the European Commission logo below it. A search bar is located on the right side of the header. The main content area features a dark blue background with a network diagram of nodes and lines. The heading 'CEF Digital' is followed by a paragraph: 'A new generation of high-speed, secure cross-border digital public services is a key component in the advance towards a Digital Single Market and essential for social and economic growth, competitiveness, social inclusion and the internal market.' Below this, there are two columns of content. The left column is titled 'CEF Building Blocks' and includes a sub-heading 'About the Building Blocks' and a list item 'eDelivery'. The right column is titled 'Sector Specific DSI' and includes a sub-heading 'Business Registers Interconnection System (BRIS)' and a list item 'Cybersecurity'.

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](mailto:CEF-BUILDING-BLOCKS@ec.europa.eu)

---

© European Union, 2017. All rights reserved. Certain parts are licensed under conditions to the EU.  
Reproduction is authorized provided the source is acknowledged.



5

**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** ●
  - January** ●
  - February** ●
- eInvoicing from a user's perspective (incl. ordering & payments)
- Technical webinars
- Basic XML + XML Validation mechanisms + OASIS UBL 2.1 and UN/CEFACT CII D16B

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

A decorative graphic consisting of three overlapping squares in shades of light blue and white, positioned to the left of the main text.

1

**A few words from the Directive on electronic  
invoicing in public procurement**

---

# 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

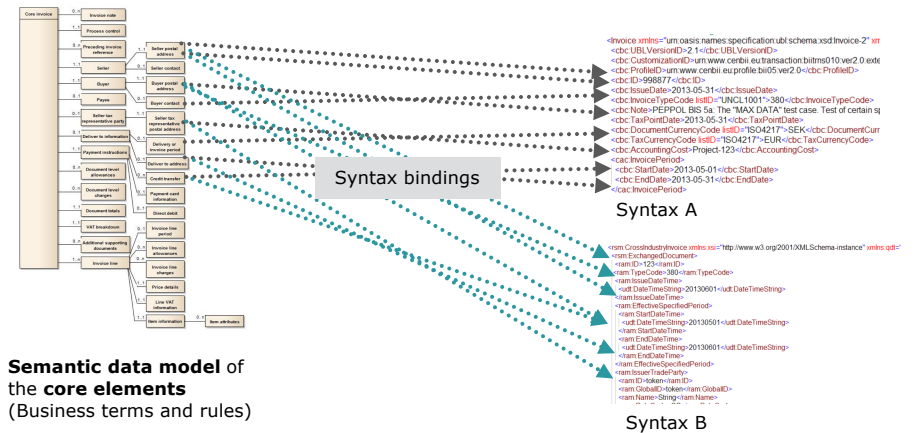
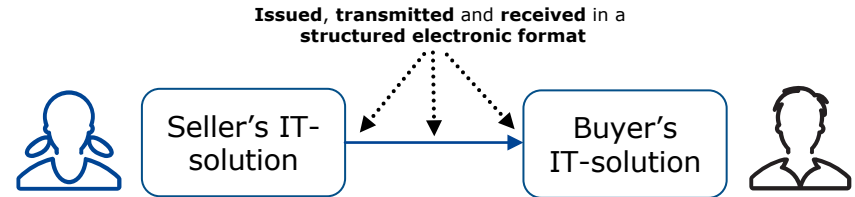
(1) **'electronic invoice'** means an invoice that has been issued, transmitted and received in a structured electronic format which allows for its automatic and electronic processing;

(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)





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 choice
- 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

***Preferred 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 initiation

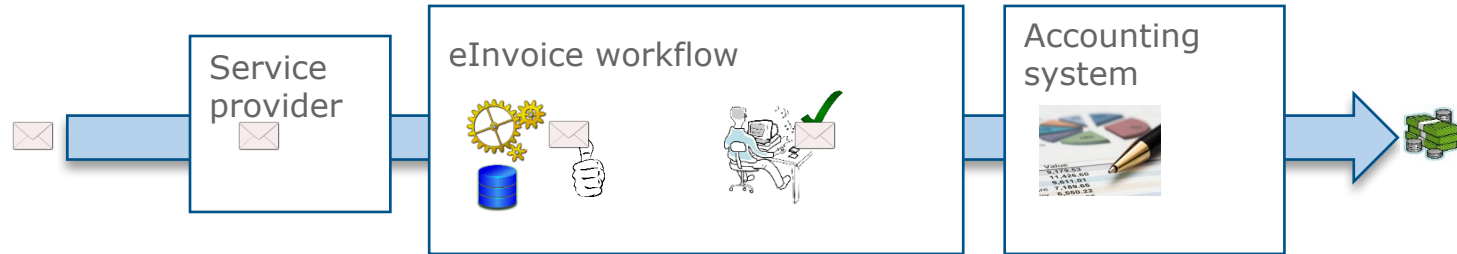
### **Integration between above solutions**

---

# 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

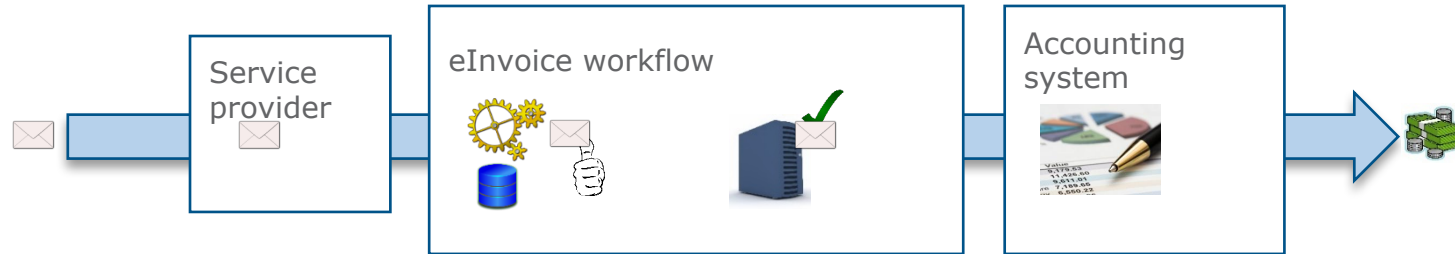


- The invoice is routed automatically to the workflow
- The supplier is known by the buyer
- There is a reference in the invoice for forwarding in the workflow
- The invoice is assessed, approved and payment is initiated

---

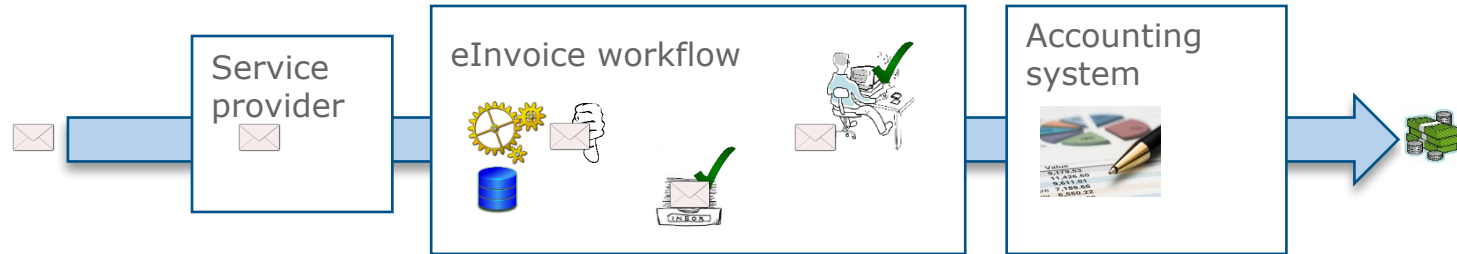
# Buyer process

## 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

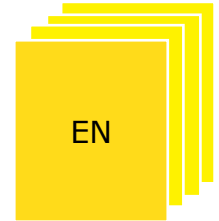
**Existing European core  
eInvoice models**

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

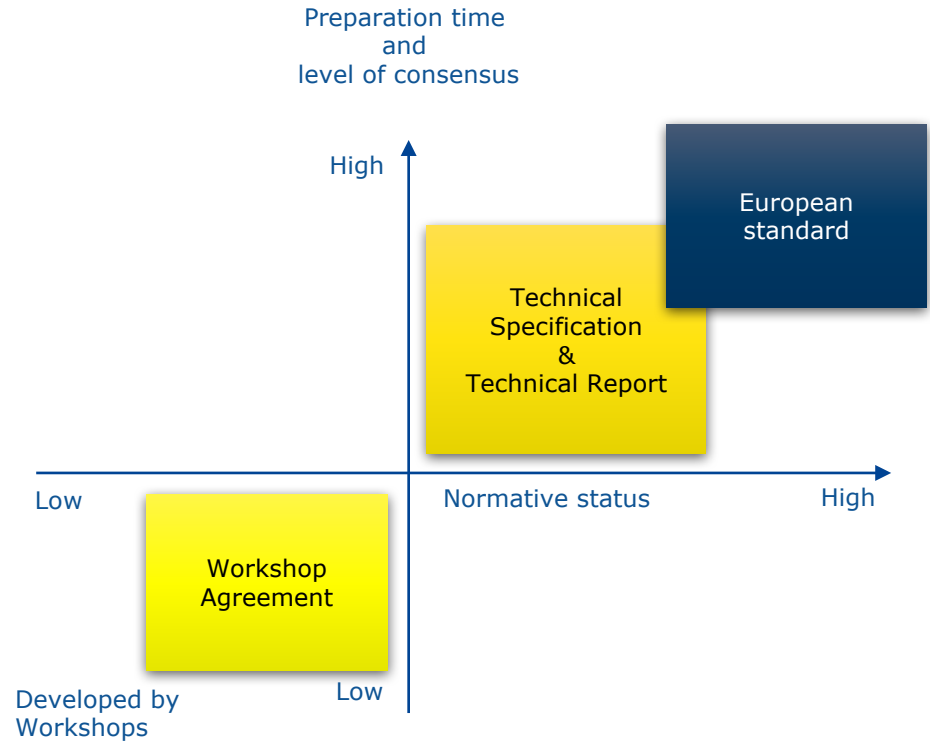
The standards organisation shall also take into account:

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

© 2017 CEN All rights of exploitation in any form and by any means reserved  
worldwide for CEN national Members.

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)

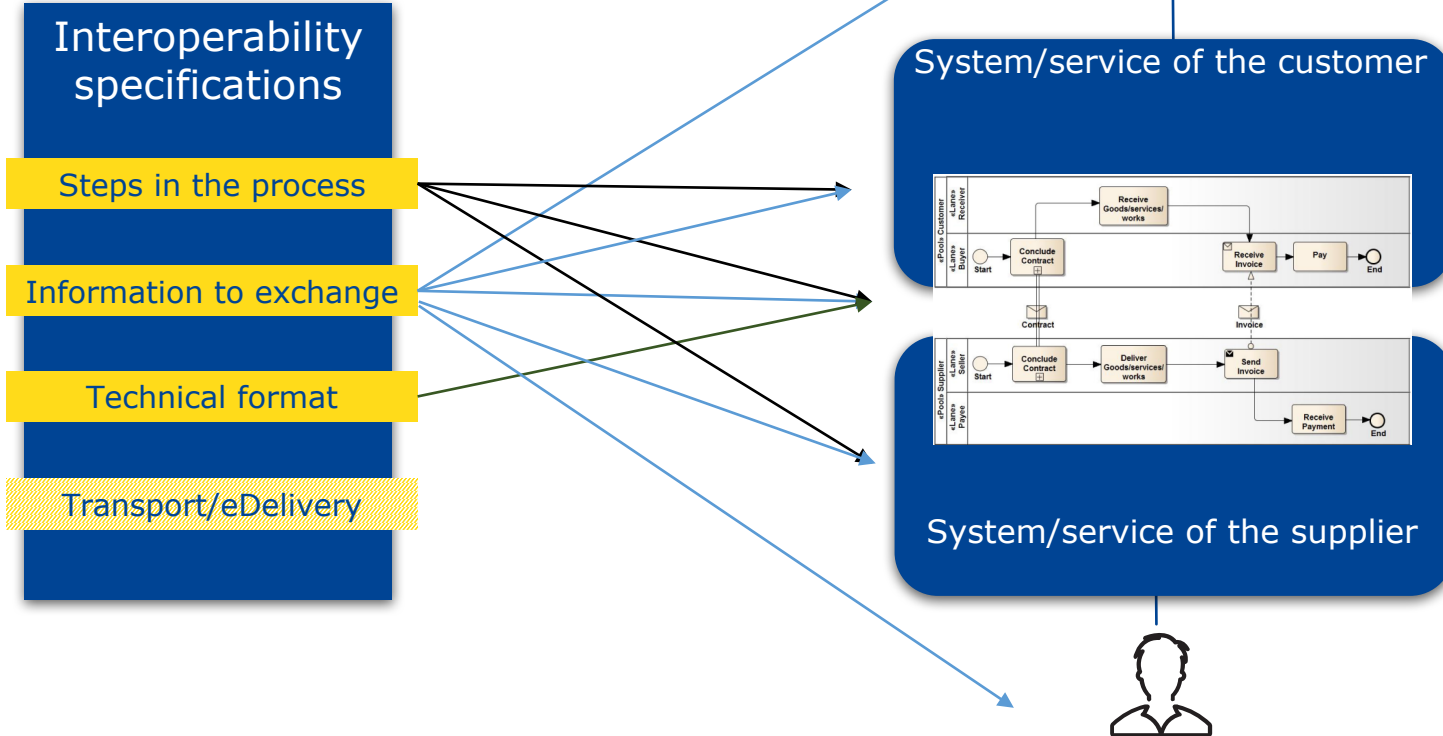
Annex B – Assessment of the EN towards the  
Standardization request (Informative)

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

Annex D – BPMN symbols (informative)



# Areas covered by the standard



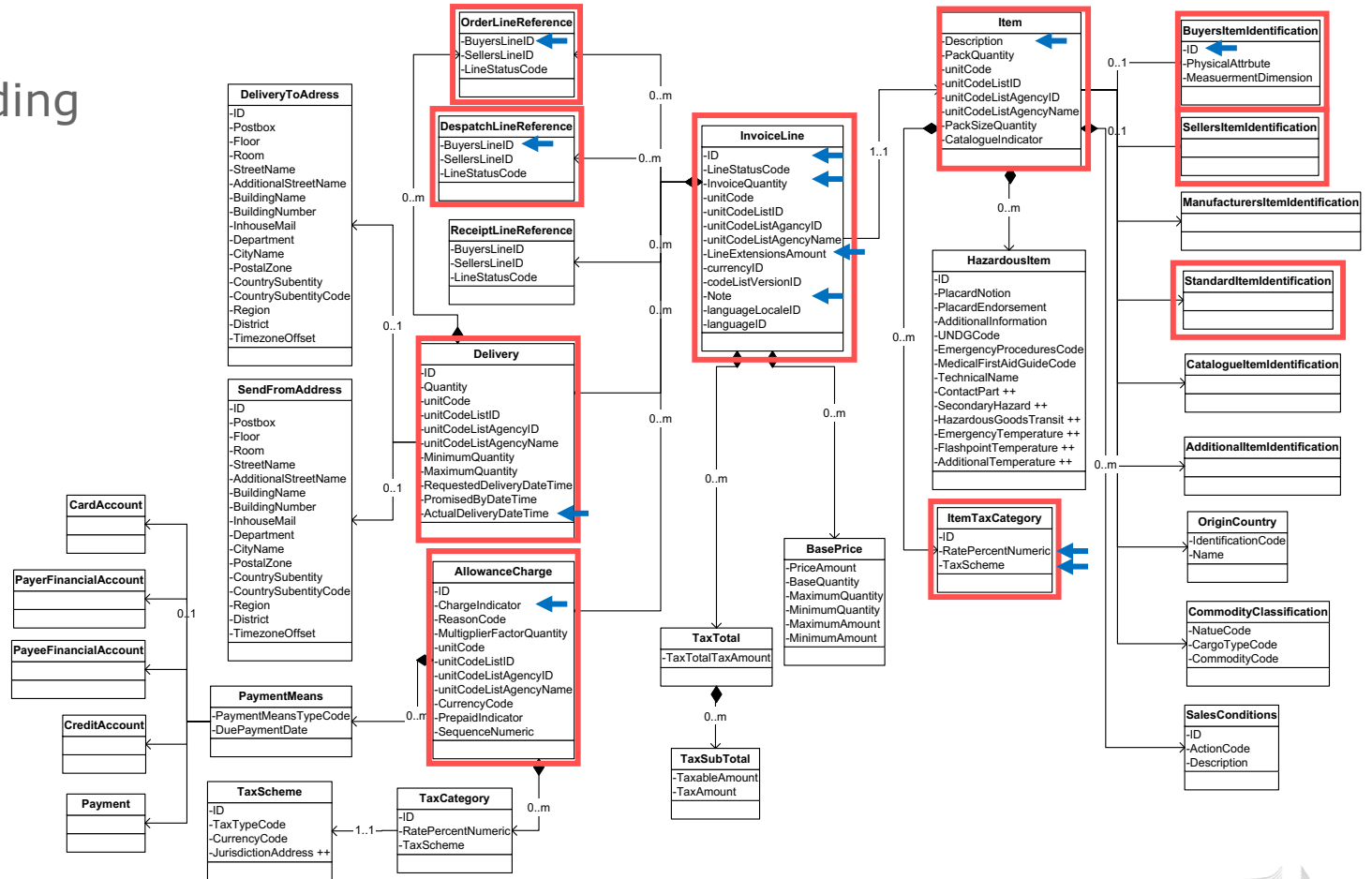
---

# 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

# Common understanding

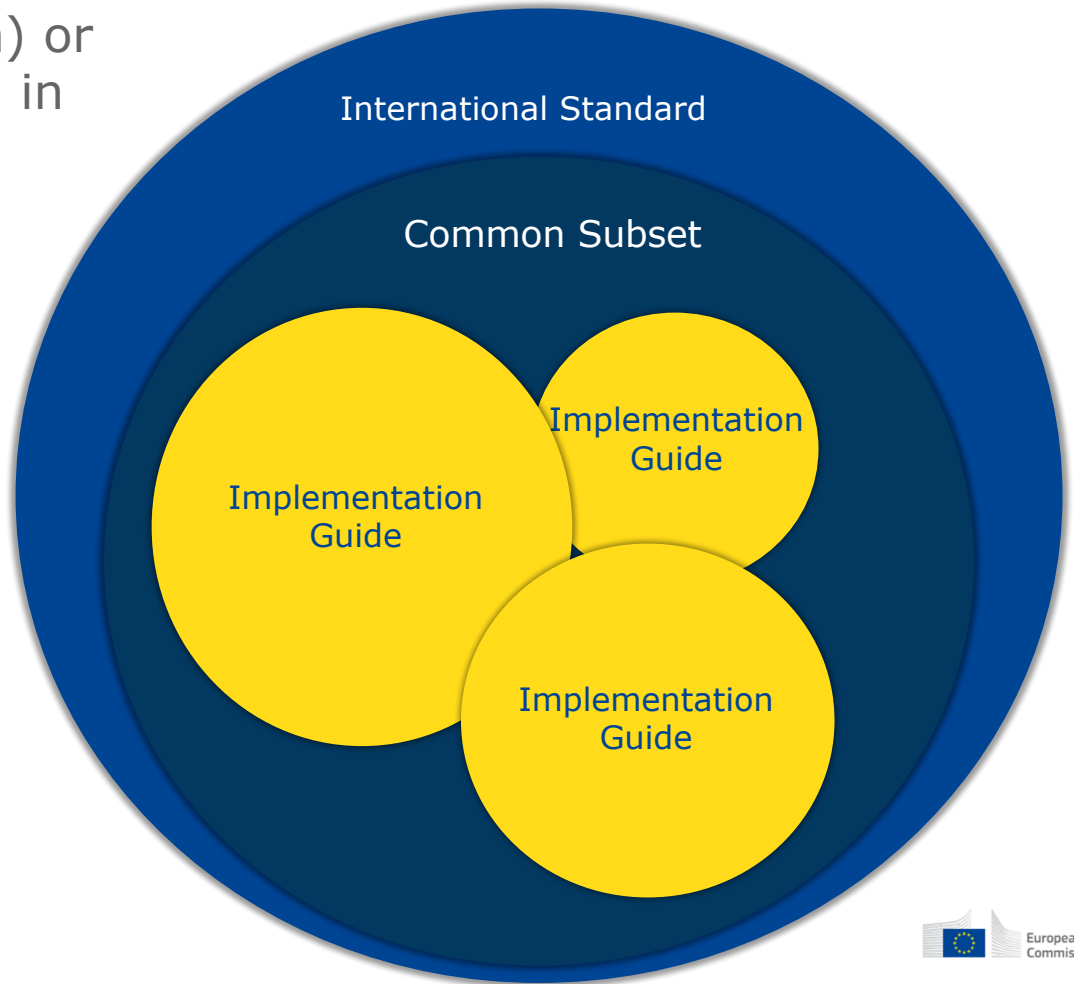


---

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

**The subset approach**

- The subset becomes the  
framework/outer boundaries

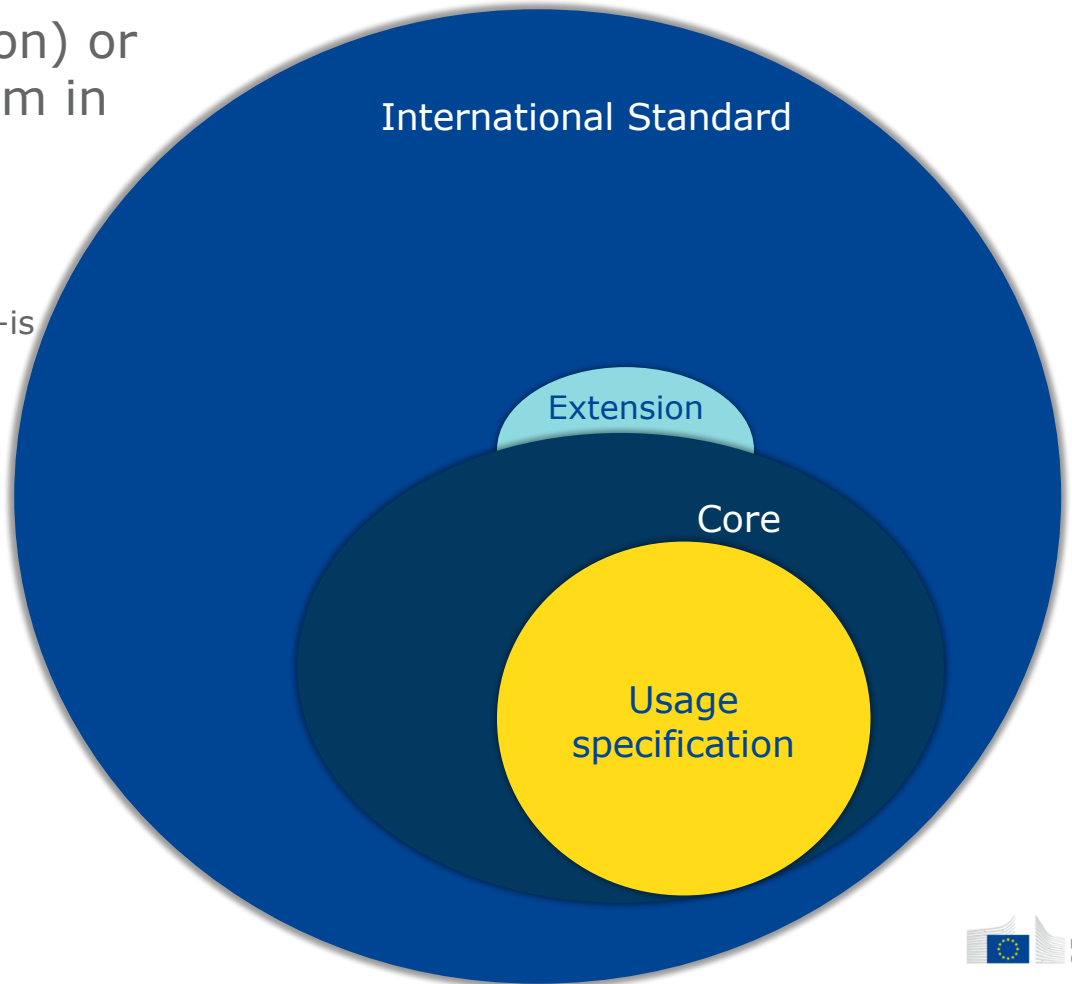


---

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?

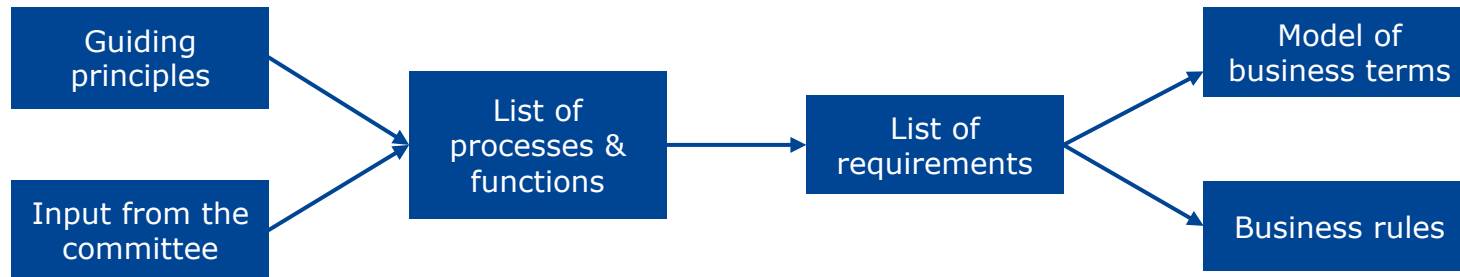
The norm identifies a few **guiding principles**:

- 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

---

## Requirement driven approach on defining the model

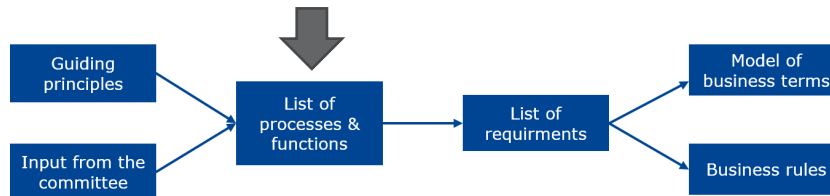
- Each business term in the model comes from one or more documented (and numbered) requirement
- The requirements give a good understanding of the background



# 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

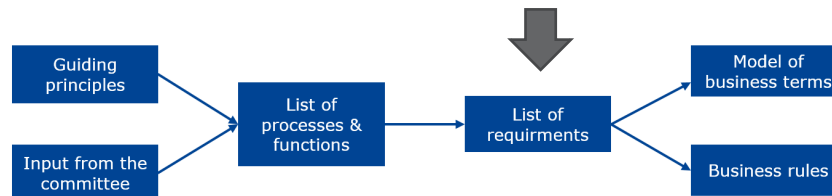


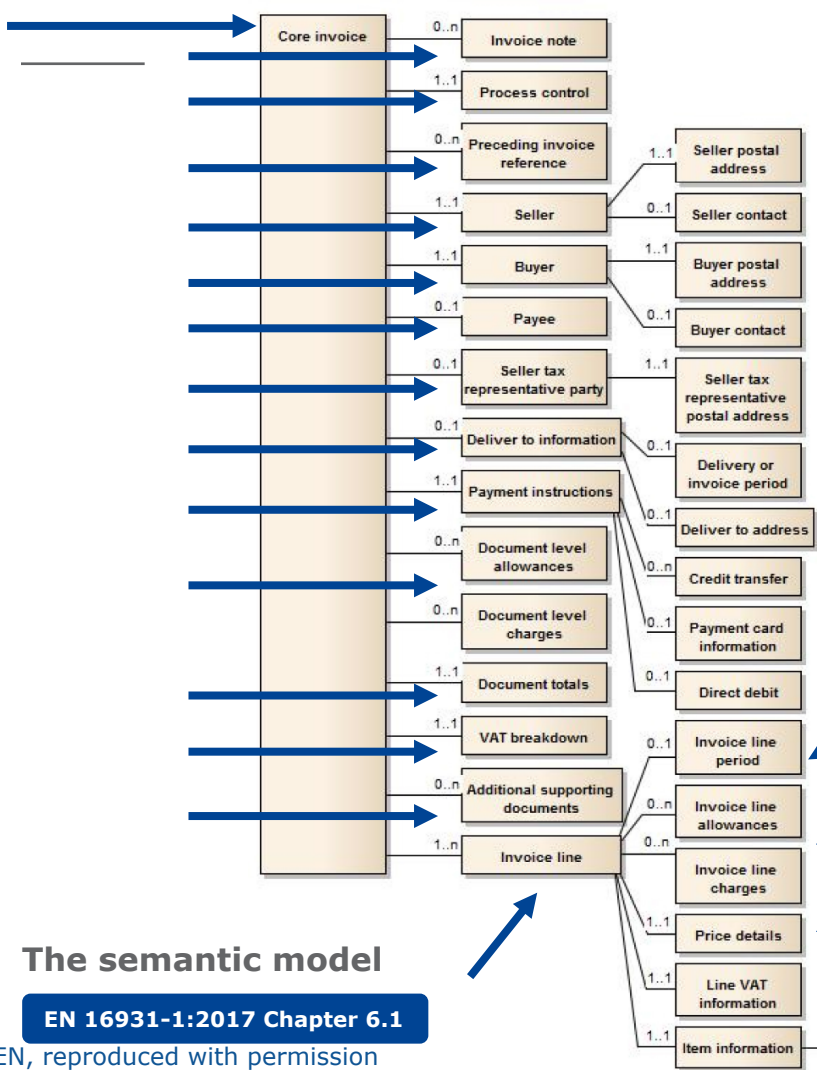


# Business requirements derived from the processes

- 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);





## Examples of key components

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

Seller information  
 Name (1..1)  
 Trading name (0..1)  
 Identifier (0..n)  
 Legal registration identifier (0..1)  
 VAT number (0..1)  
 Additional information (0..1)  
 ...

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

VAT Breakdown  
 Category taxable amount (1..1)  
 Category tax amount (1..1)  
 Category code (1..1)  
 Category rate (1..1)  
 Exemption text (0..1)  
 Exemption code (0..1)

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

# Examples of business terms

ID	Level	Cardinality	Business Term	Description	Usage Note	Req. ID	Semantic data type <sup>2</sup>
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

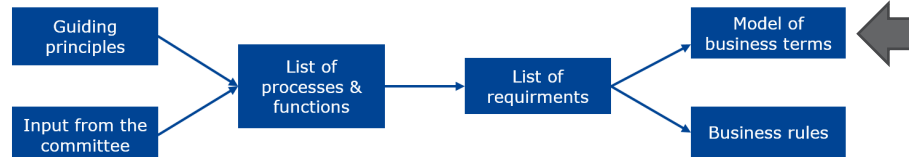
**Business term** – name of the business term

**Description** – short description/definition

**Usage note** – guiding/explanatory information

**Req id** – reference to underlying requirement

**Data type** – the type of



# 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

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):

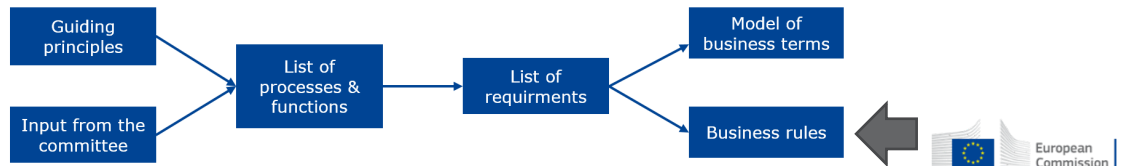
- application/pdf (.pdf)
- image/png (.png)
- image/jpeg (.jpg)
- text/csv (.csv)
- application/vnd.openxmlformats-officedocument.spreadsheetml.sheet (.xlsx)
- application/vnd.oasis.opendocument.spreadsheet (.ods)

**Data types can have supplementary components/attributes**

---

# 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

# 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 Charges line	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 = $\sum$ Invoice line net amount.	Document totals	BT-106

**ID** – Unique id for each business rule

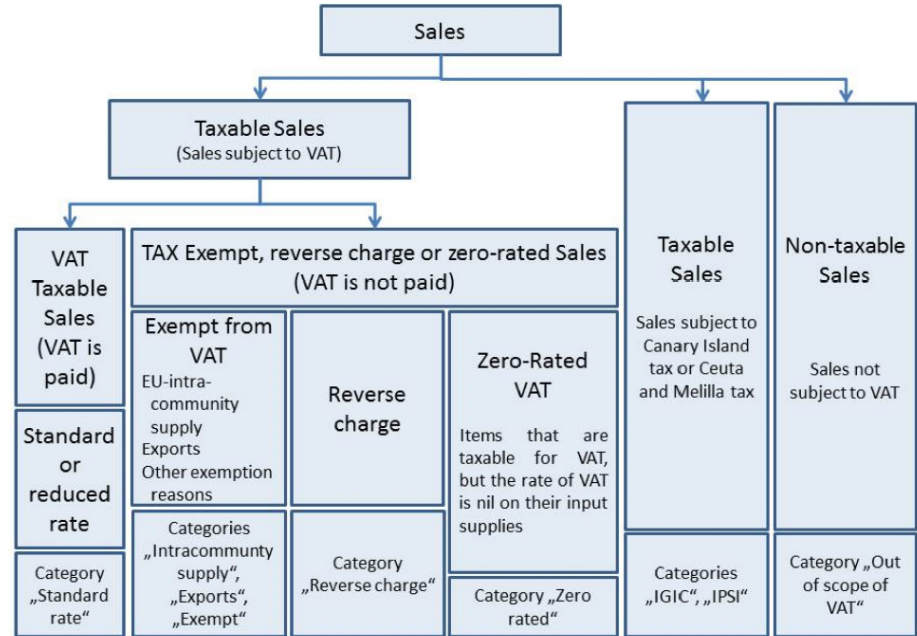
**Description** – textual description of the rule

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

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

# 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 allowance where the Invoiced item VAT category code (BT-151, BT-152) 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).



## 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

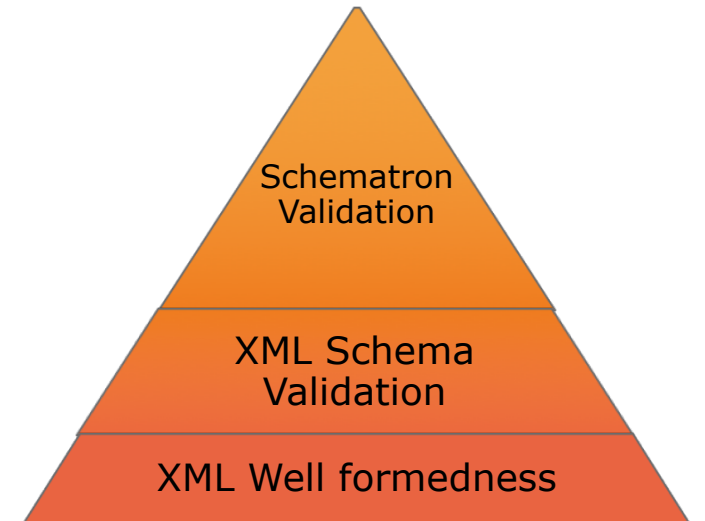
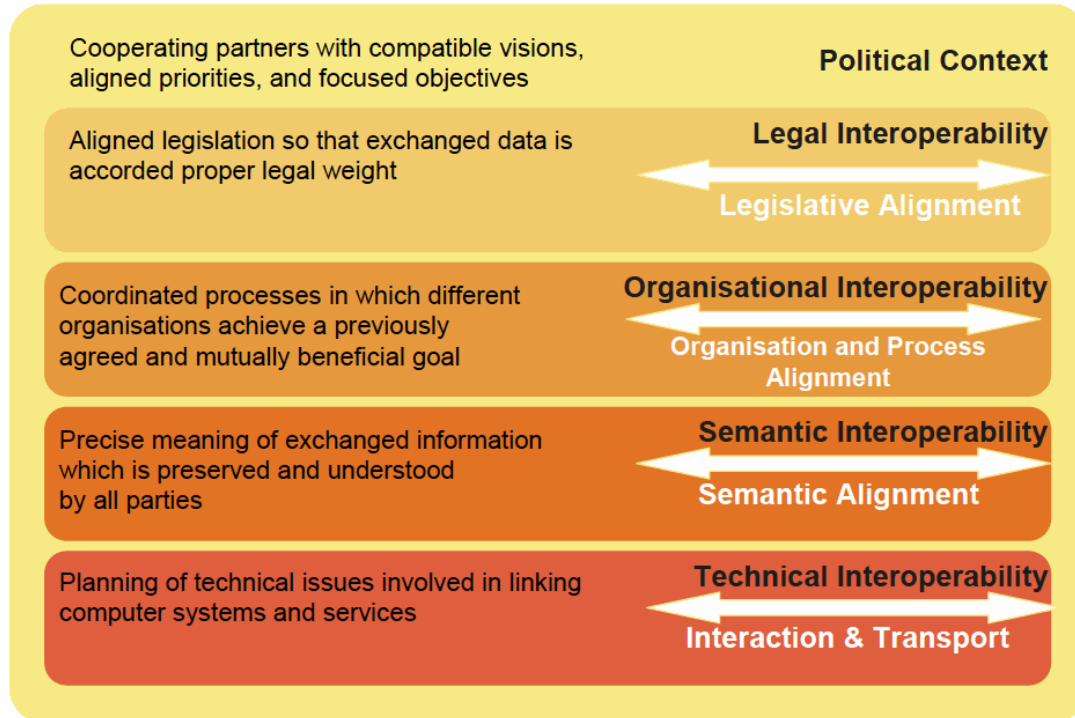
## XML Schema

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

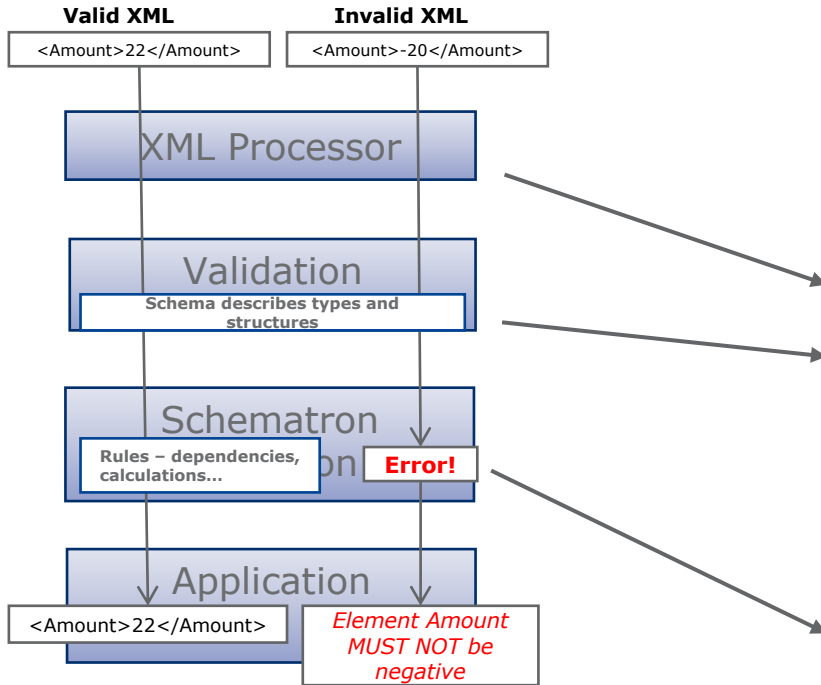
## Schematron

- 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



SFT! Start Additional Info Switch to Swedish Log out

## Report

View as PDF

Filename: Svefaktura-Tom OrderlineReference.xml

### Document Types

Description	Matched	Info	Warning	Fatal
XML Structural Validation	Yes	0	0	0
XML Schema	Yes	0	0	1
Additional rules	Yes	0	2	0
Business rule 2	Yes	0	0	0

### XML Structural Validation

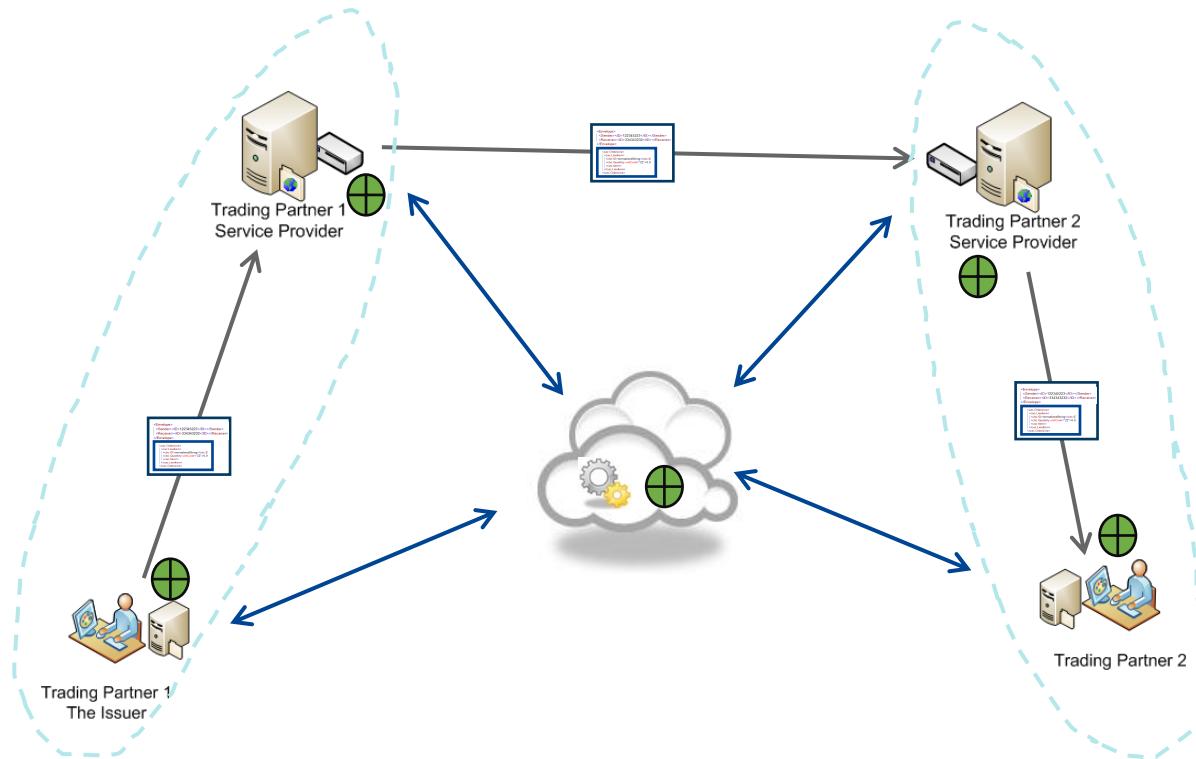
### XML Schema

Flag	Message	Location
fatal	In content of element <InvoiceLine>: The content model does not allow element <Q[...eComponents:1:0]Items> to appear immediately after element <Q[...eComponents:1:0]OrderLineReference>. The following elements would be valid here, all in namespace urn:sfti:CommonAggregateComponents:1:0: AllowanceCharge, DespatchLineReference, Delivery, Item.	Line -1, character -1

### Additional rules

Flag	Message	Location
warning	Optional xml-elements should not be stated if empty (no value inside the element).	/Invoice[1]/InvoiceLine[1] /OrderLineReference[1]/
warning	Optional xml-elements should not be stated if empty (no value inside the element).	/Invoice[1]/InvoiceLine[1]/Items[1]/

# Who validates?



## Question

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

A decorative graphic consisting of three overlapping squares. The top square is light blue, the middle square is a slightly darker blue, and the bottom square is white. The number '6' is centered on the white square.

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

---

# 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.

---

# 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).*

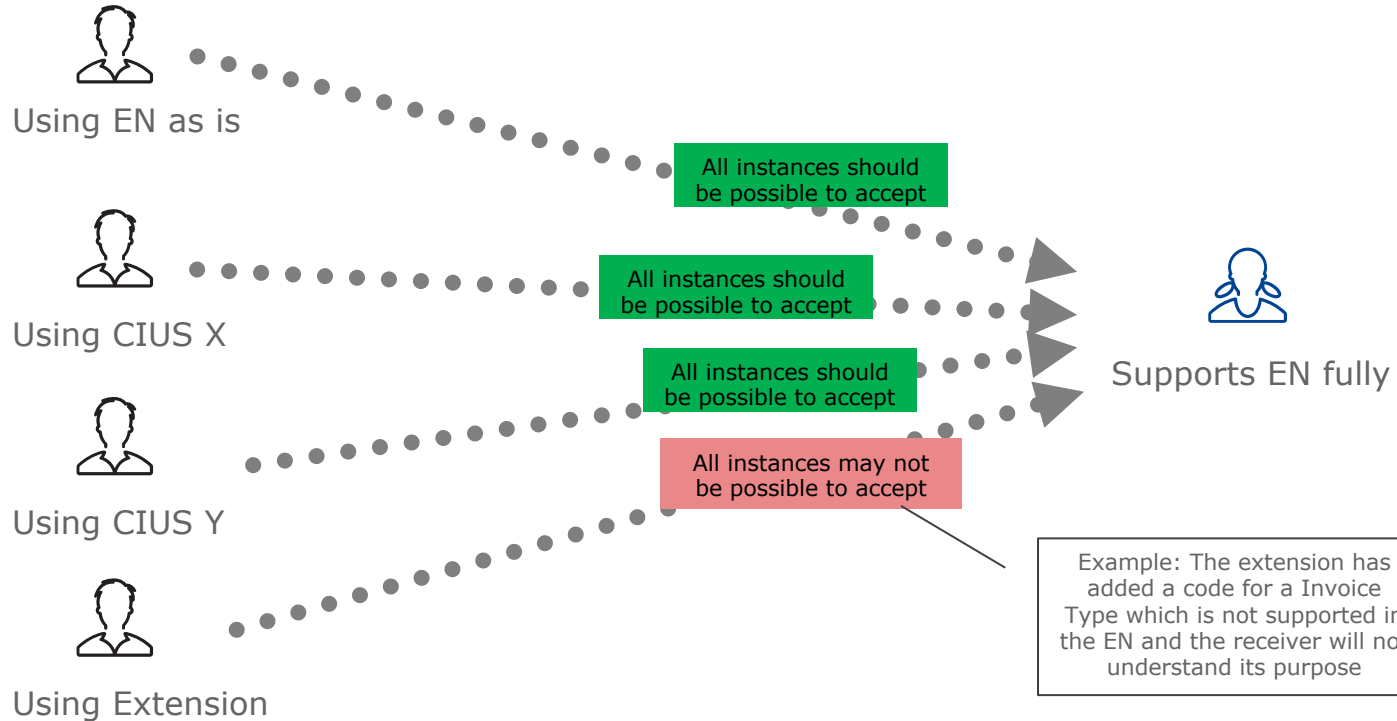
---

# Claiming compliance towards the norm

## ***Compliance of sending or receiving party***

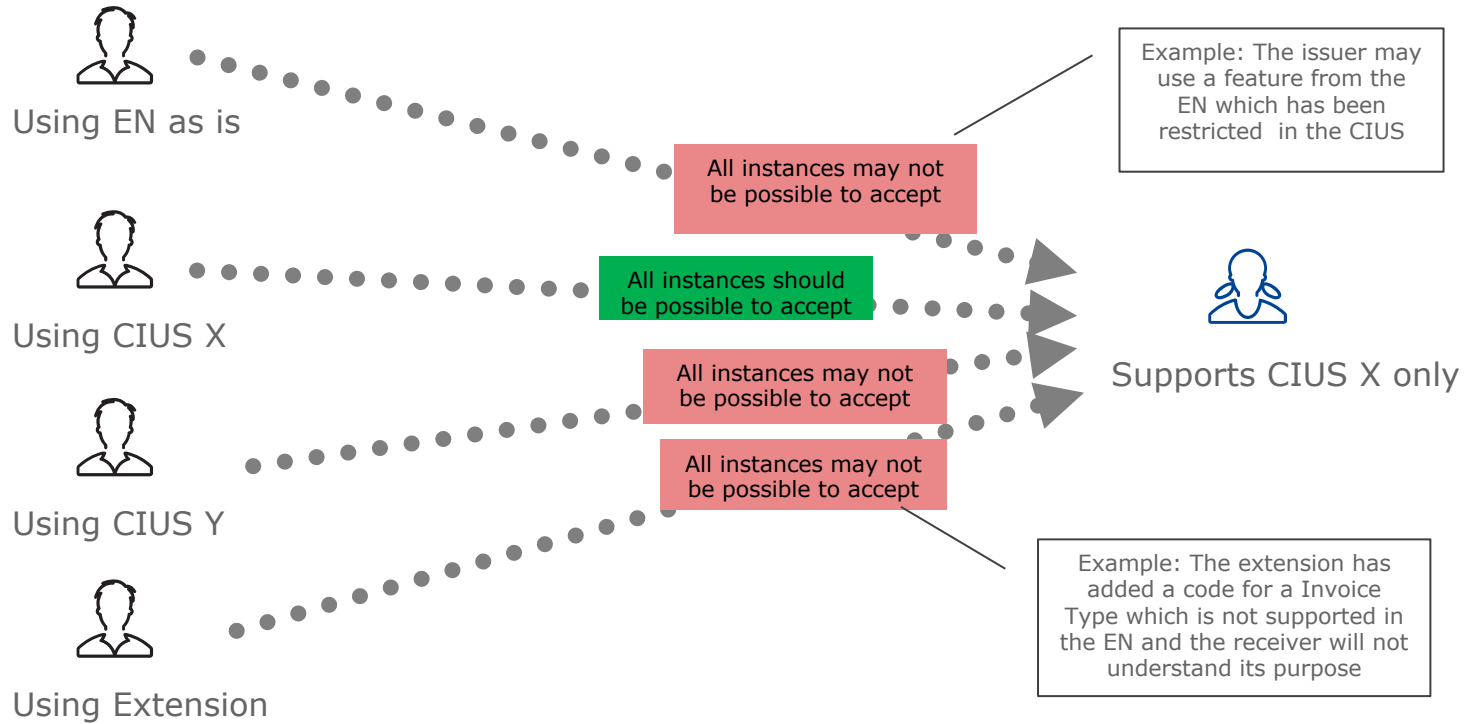
*A receiving party may only claim compliance to the core invoice model if he accepts invoices that comply with the core invoice model in general, or with a CIUS, that is itself compliant with the core invoice model.*

# A few scenarios



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

# A few more scenarios



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

## Question

**CIUS – benefits and challenges, what is your opinion?**

**Coffee break!**





# 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**  
.....

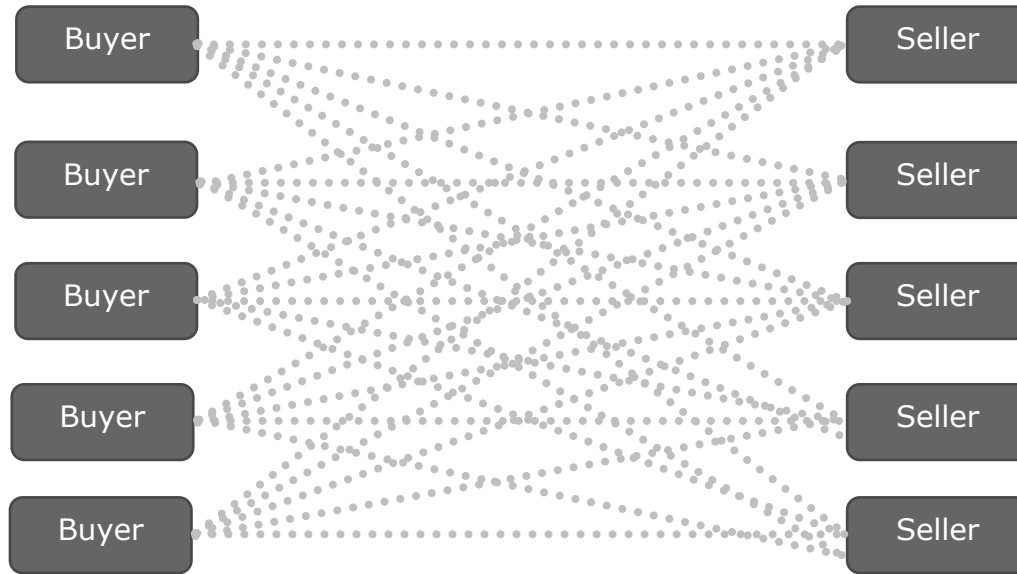
A decorative graphic consisting of three overlapping squares in shades of light blue and white, positioned to the left of the main text.

1

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

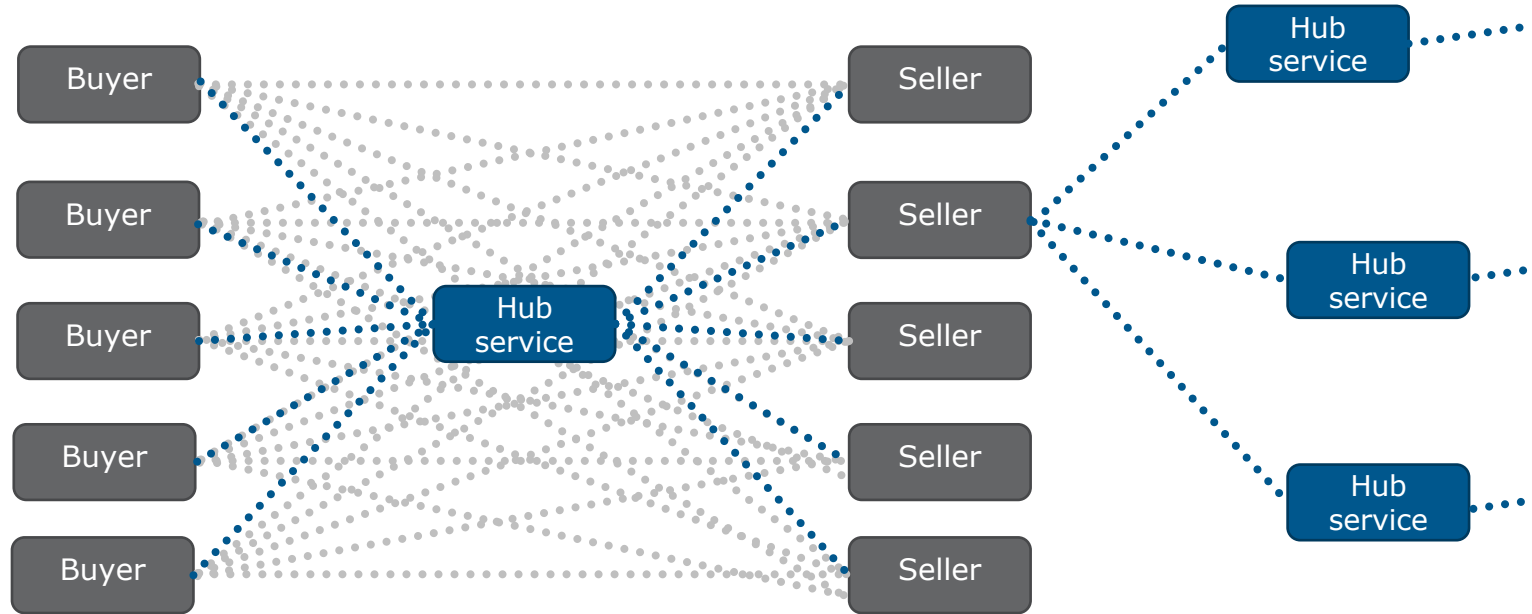
---

## How it used to work...



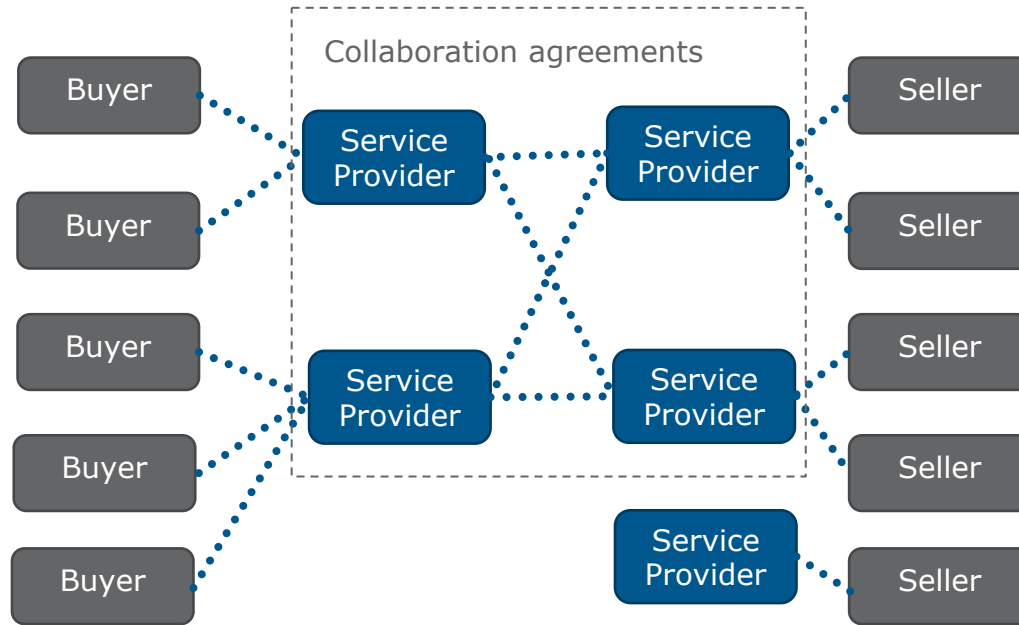
- Bilaterally agreed configuration of format, protocol, security
- In-house IT-solutions
- Each new connection => a project

## 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

A decorative graphic consisting of three overlapping squares in shades of light blue and white, positioned to the left of the main text.

**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

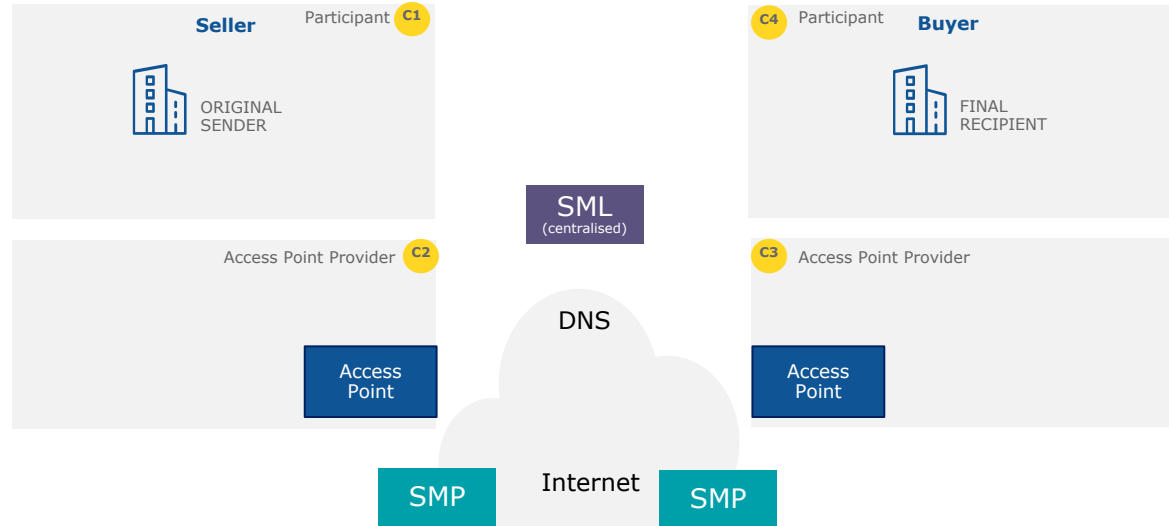
The role of the AP (Access Point) is to send and receive messages in a secure and reliable way, on behalf of the Participants. The AP is essentially a simple which is often offered together with other value added services by a Service Provider.

## 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.

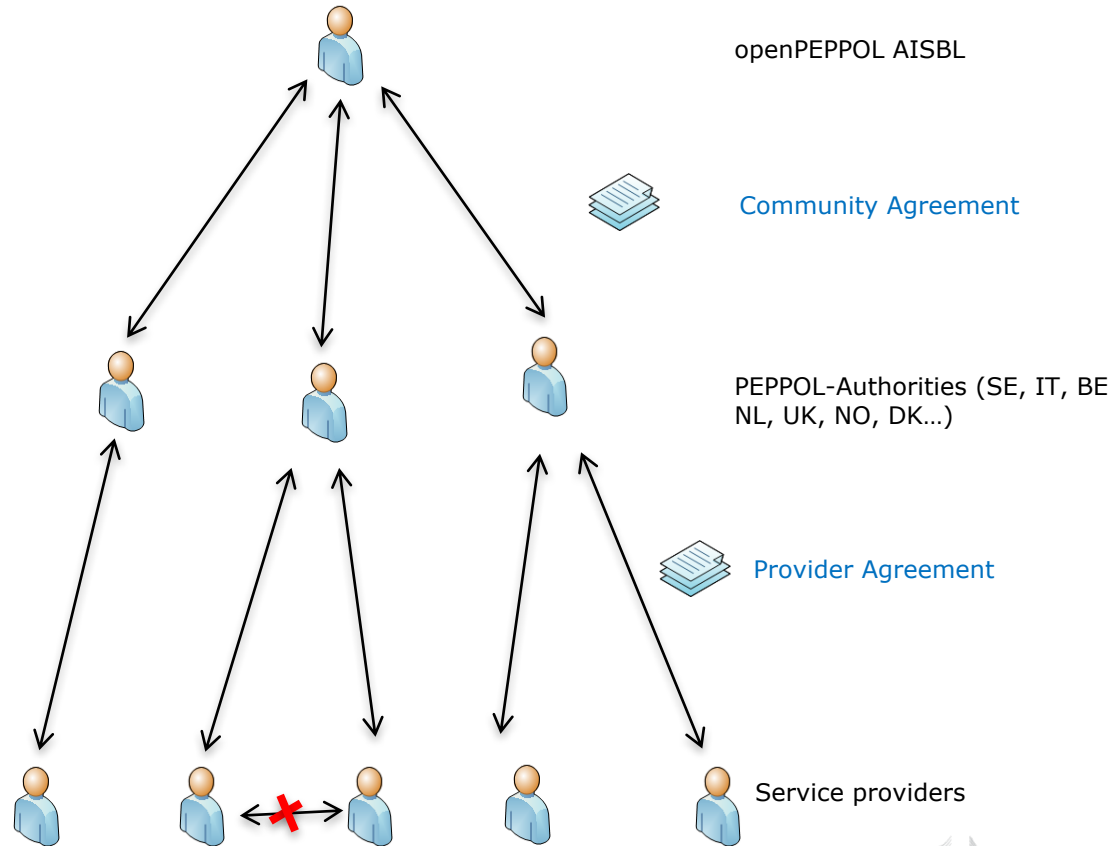


# Transport Infrastructure Agreements (TIA)

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)



# Discovery models

CEF eDelivery

## 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 at 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

- + High speed as there is no overhead processing
- Less flexible, change of irrelevant references

- + More automated and flexible
- Slower speed, as some overhead processing is required

# Dynamic discovery in detail

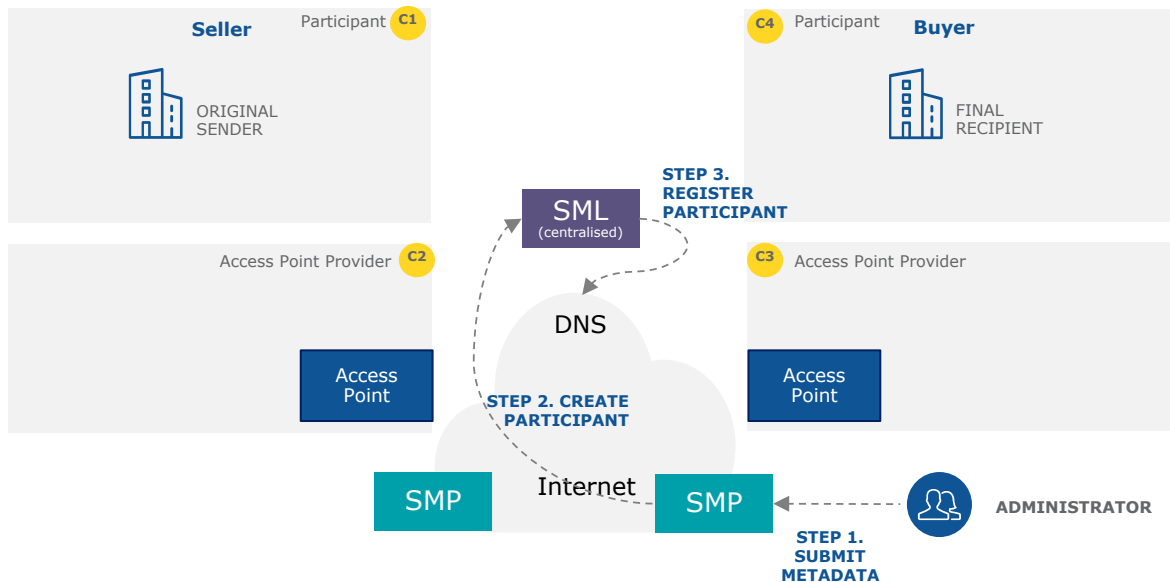
## SML

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.

## Phase 1: Registration



# Dynamic discovery in detail

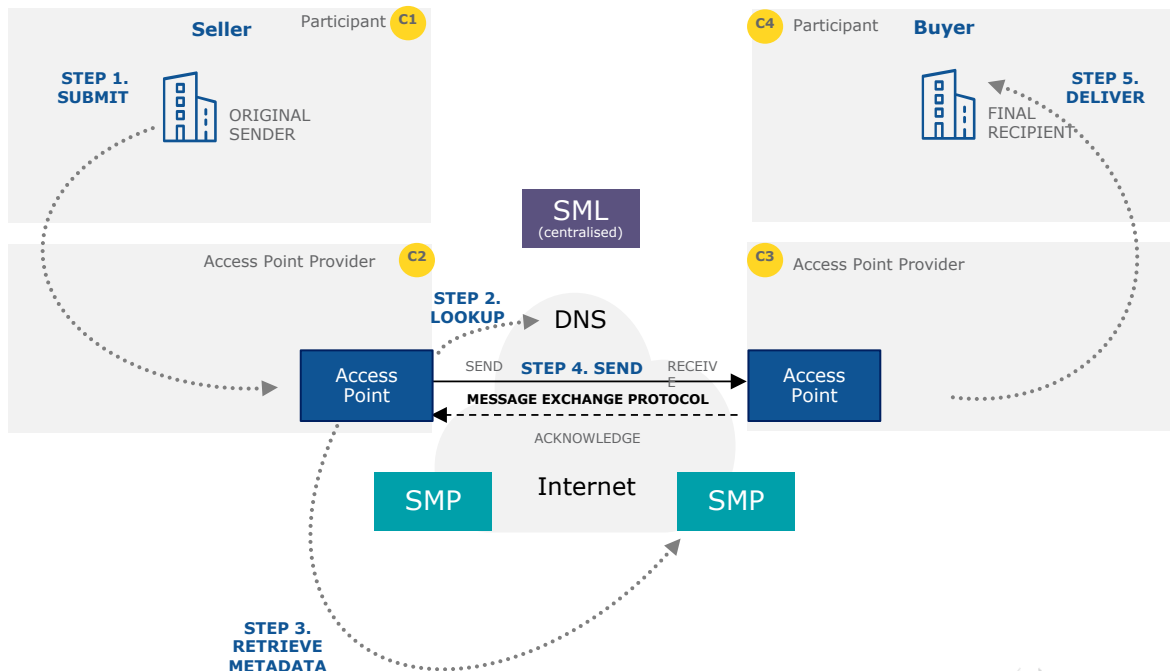
## SML

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.

## Phase 2: Operations



# 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

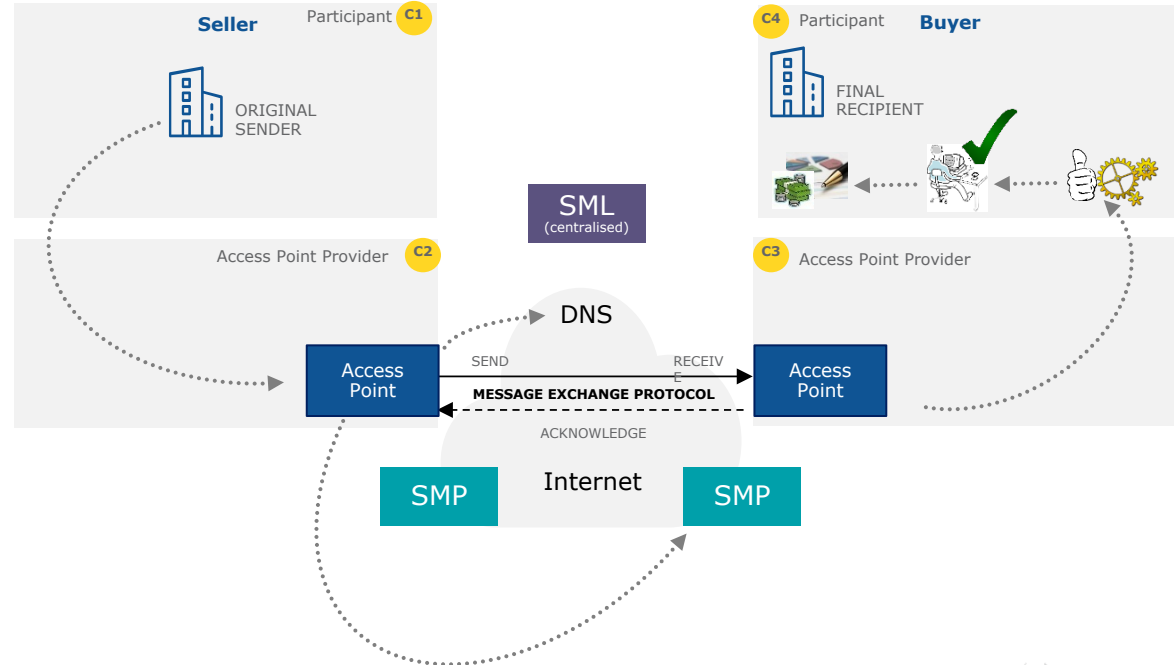
A participant registered in the PEPOL Infrastructure is visible as a receiver by everybody. The SML/SMP is open for queries.

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



# Consequences for the users

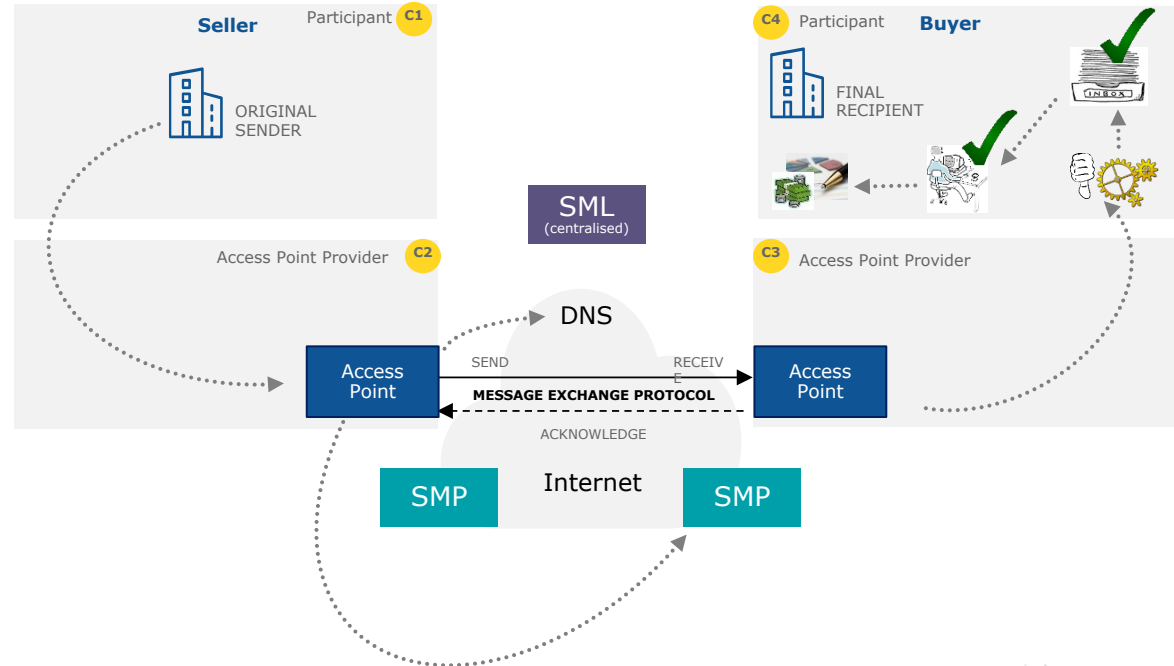
A participant registered in the PEPPOL Infrastructure is visible as a receiver by everybody. The SML/SMP is open for queries.

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 – Unknown business partner





**5**

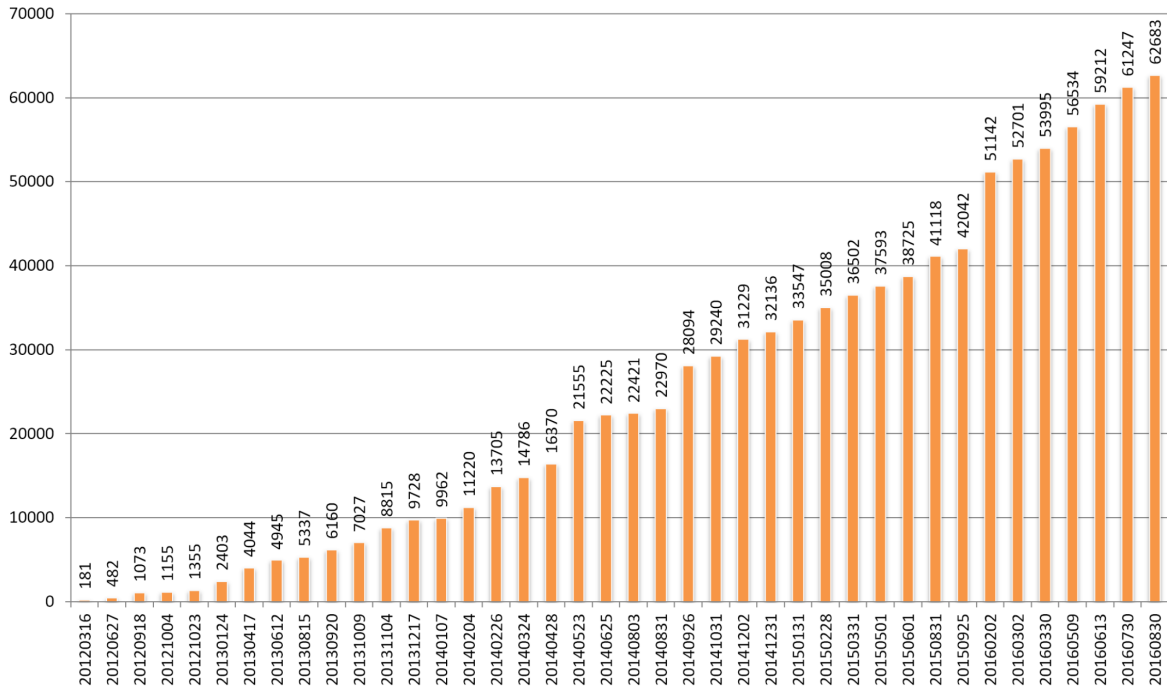
## **Scalability of the infrastructure**

# 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

## Total number of organizations capable of receiving eInvoices in PEPPOL





Source: [www.galaxygw.com](http://www.galaxygw.com)

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






# CEF eDelivery is not a one-size fits all solution

SCOPE OF CEF eDELIVERY

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

# Reuse of building blocks by CEF's sectorial projects

## Building Block DSIs

Sector Specific DSIs		Building Block DSIs				
		eDelivery 	eSignature 	eID 	eTranslation 	eInvoicing 
Europeana*	DG CONNECT					
Safer internet*	DG CONNECT					
Public open data	DG CONNECT					
ODR	DG JUST					
eHealth	DG SANTE					
eProcurement	DG GROW					
EESSI	DG EMPL					
EU e-Justice portal	DG JUST					
BRIS (ECP)	DG JUST					
Cybersecurity	DG CONNECT					
eTranslation	DGT					

Commitment to analyse

Commitment to reuse

Reusing

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

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

CEF Digital Home > eDelivery > All CEF eDelivery services > Access Point software

## e-SENS AS4 conformant solutions

This page lists the solutions that have passed or are in the process of passing the conformance testing according to the e-SENS AS4 profile:

- [Domibus \(EC sample implementation\)](#)
- [EESI AS4.NET](#)
- [Flame](#)
- [Holodeck](#)
- [IBM](#)
- [Laurentius](#)
- [Mendelson](#)
- [RSSBus](#)
- [ADES](#)
- [iFenix](#)

**All eDelivery Services**

- TECHNICAL SPECIFICATIONS
  - [Access Point specifications](#)
  - [Connector specifications](#)
  - [Security Controls guidance](#)
  - [SML specifications](#)
- SOFTWARE
  - Access Point software**
    - [SML software](#)
    - [SMP software](#)
  - MANAGED SERVICES
    - [PKI Service](#)
    - [SML service](#)
  - TESTING SERVICES
    - [Connectivity testing](#)
    - [Conformance testing](#)
  - SUPPORTING SERVICES

## Certified PEPPOL Access Points (APs)

SEARCH

**Who is who**

**OpenPEPPOL member list**

**Certified PEPPOL Access Points (APs)**

**PEPPOL Authorities (PAs)**

**Coordinating Community (CC) Leaders**

**Work Group Leaders**

**Change Management Boards (CMBs)**

**Managing Committee (MC)**

**Coordinating Community**

**Certified PEPPOL Access Points (APs)**

PEPPOL Access Point Providers	AP Location	PEPPOL Authority	Contact Name
AdValvas Europe	Belgium	FEDICT	Michel Gills
Advanced Business Software and Solutions UK	UK	OpenPEPPOL	Peter Leigh
Akness Innkjop (Prosjektservice AS)	Norway	DIFI	Tommy Storjord
Aknesspunkt Norge AS	Norway	DIFI	Morten Buskop
Aliquid Italy	Italy	OpenPEPPOL	Fabrizio Pastorello
Amesto Solutions Purchasing A/S	Norway	DIFI	Thomas Karlsen
Anachron B.V.	Netherlands	DIGST	Marco Eeman
Apix Messaging Oy	Finland	DIFI	Antti Marjala
Apro Consulting Services B.V.	Netherlands	Simpler Invoicing	Heinen Wijmand
Archiva S.r.L.	Italy	OpenPEPPOL	Lorenzo Della Vedova
Archivium Srl	Italy	OpenPEPPOL	Lauritano
At Work Systems	Norway	DIFI	Tore Solheim
Babelway	Belgium	OpenPEPPOL	Mathieu Pasture
Basware	Finland	DIFI	Fredrik Heimerback
BEAst AB	Sweden	ESV	Peter Fredholm
BIZbrains A/S	Denmark	DIGST	Per Lund Thomsen
Bluzor B.V.	Netherlands	DIFI	M. Frenksen



---

# 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?**



---

# Examples of early adopters of large scale e-Invoicing - lessons learned

Christian Vindinge Rasmussen



1

# **eInvoicing from the early adopters in Europe - The Nordic perspective**

# The first steps

---

# THE DANISH EXPERIENCE

---

# The process leading to full electronic invoicing

- October 2003
  - Ministry of Finance hired KPMG to analyze how to optimize the fund transfer process in Denmark
  - KPMG analysis stated that the public sector would save 1 Mia. Dkr. (€ 100->135 Mio.) per year, by optimizing the fund transfer process.
  - The report stated that paper based invoicing would be a prime candidate for digitisation

---

# Budgetary analysis

A general budgetary analysis of public payments identified a total efficiency potential of appx. € 100 mill./year:

- Elimination of float-days Appx. € 25 mill./year
- Closing of cash tills Appx. € 15 mill./year
- Easy Account Appx. € 30 mill./year
- E-Invoicing Appx. € 30 mill./year
- 15 million invoices/year
- Estimated €2 reduction in handling cost/invoice



---

# Funding

The savings estimated had to be divided evenly on the public sector.

The savings was distributed amongst the public institutions (both state and municipal) based on their expected invoicing volume in 2004.

And based on the distribution of the expected savings, each Ministry and municipality were withdrawn the amount of expected saving from their appropriation for 2005 and onwards.

---

## What to do?

In 2009 NemHandel (EasyTrade) was introduced

NemHandel is an open, shared and yet secure infrastructure using the internet.

There is only one central component – the NemHandel registry

NemHandel makes room for solutions that meet the different needs and IT skills of both small and large companies

NemHandel contain guidelines and components that makes it easy for it-vendors to implement. The easier and cheaper it is, the more it-solutions is being offered.

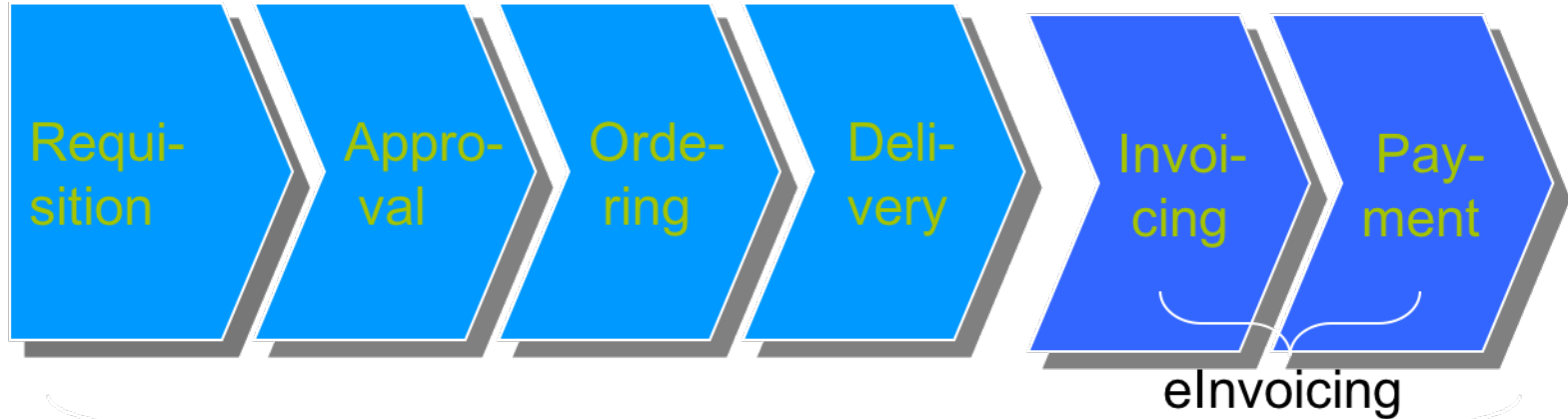
Open standards

Open source components

International format (UBL 2.0)

Focus now on e-procurement as opposed to e-invoicing

Focus is to digitalize and make the end-to-end process from procurement to invoice and payment more effective



## Electronic Procurement & Financial Systems

---

# NemHandel was made mandatory in May 2011

All public authorities are now registered in the NemHandels registry with their unique ID (GLN)

A wide range of eInvoicing solutions are being offered, a lot of new players have emerged

- Fully integrated in ERP system

- Partly integrated in ERP system

  - using an email program to send the invoices.

  - Or using a web-based invoice form

  - Government provide one, but we are not the only one

Denmark is seeing an increased use business to business

---

## NemHandel – the central costs

Around 10 mio € to establish since beginning in 2007

Including guidelines, translation of standards, tools to aid implementation, central registry, web based invoice portal, e-mail program etc.

Around 1 mio € to run and administer the central components each year

***The next steps***

***- Sweden & Norway***

---

# THE SWEDISH EXPERIENCE

---

# Sweden

## How it started

- 2005

## Standards for eInvoicing

- Use of UBL

## Forms for interconnection

- PEPPOL recommended

## Incentive to adopt eInvoicing

- Recommended to require eInvoicing in contracts
- Proposed law to mandate all suppliers to send eInvoices to public sector

## Maintenance

- SFTI (Single Face To Industry)

## Lessons learned



---

# THE NORWEGIAN EXPERIENCE



---

# Norway

## How it started

- 2009 with PEPPOL

## Standards for eInvoicing

- Use of UBL

## Forms for interconnection

- PEPPOL

## Incentive to adopt eInvoicing

- Mandatory require eInvoicing in contracts

## Maintenance

- DIFI maintains and supports

## Lessons learned



2

**Going from first movers to team effort  
across Europe – cost and efficiency  
models**

***From first movers to pan-European***

---

# There is BIG potential in Europa for eInvoicing...

- Some European examples:

- Austria

- **6-8 mio. euro** in savings per year - only by processing the invoice

- Denmark

- **90 mio. euro** in savings per year - by full electronic handling of invoices

- Ireland

- **246mio. euro** in savings per year - in est. savings by full electronic handling of invoices

- Finland

- **29-49 euro** in savings per invoice - by full electronic handling

- EU

- **240 billion euro** in savings over 6 years - by mass adoption of eInvoices

---

...but extremely hard to realize:

More than **150 billion invoices** per year worldwide (est. 2012)

...but only **3 billion** is electronic eInvoices (est. 2012)

...Europe (especially Scandinavia) is leading in B2G eInvoices

...US is leading in B2B

...Latin & South America in B2C eInvoices

**Moderate market penetration despite solid business cases**

---

# Mainly due to the barriers

**Standards & Formats**

**Business models**

**Legislation**

**eInvoices alone**

**World economy**

**Islands of procurement**

---

# Many standards and formats

## Global standards

- ebXML, OASIS UBL2.0, UBL2.0 NES Subset, UN/CEFACT, EDIFACT

## Local/regional standards

- OIOXML (Denmark), BMF (Belgium), Finvoice (Finland), Svefaktura (Sweden), EHF (Norway)

**Mappings between all these standards are needed to create interoperability between the sender and receiver of e-Invoices**

**Many e-invoicing suppliers support only 1 standard**



---

# Complicated business models

The eInvoice service providers have very different business models of eInvoicing:

- Fixed pricing per invoice
- Fee per supplier
- Fixed subscription
- Per invoice percentage fee

**Nearly impossible to support all business models for the client**

**All parties in the “four corner model” has to benefit from implementation of eInvoice**

---

# eInvoices in Europe today is part of isolated implementations

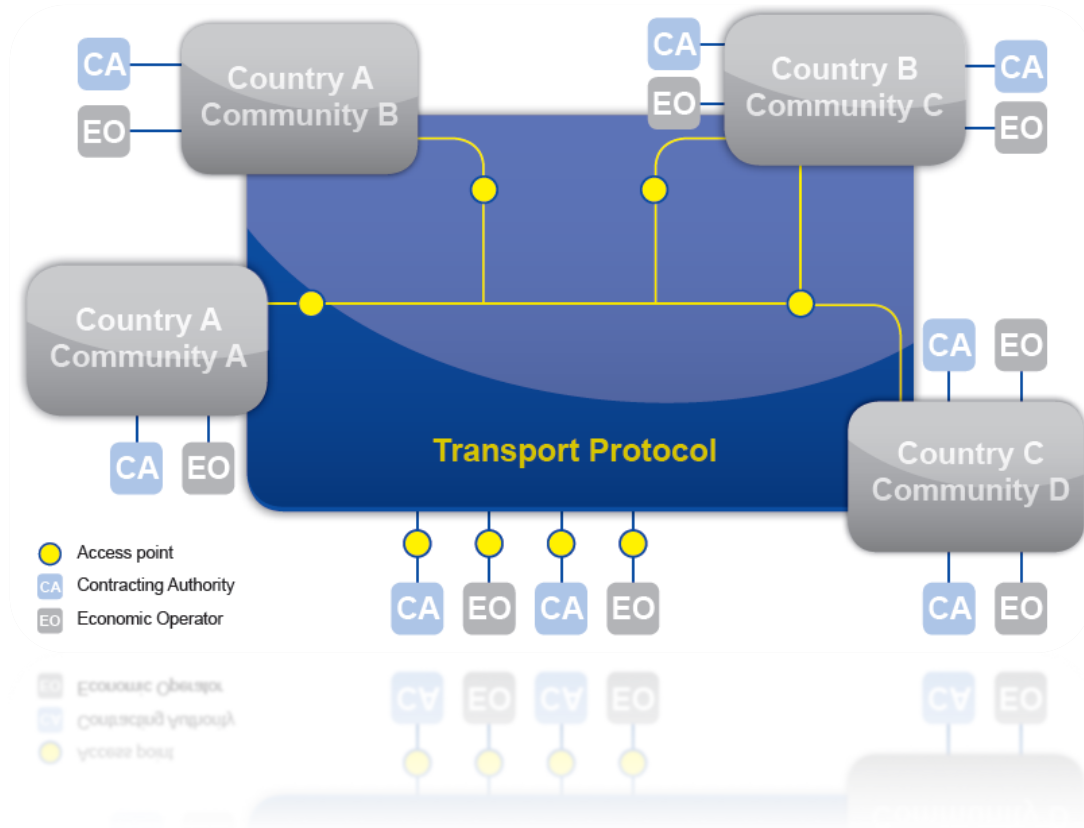
Many service providers offers:

- Few standards and formats
- Local but highly specialized legislation knowledge
- No cross-border interoperability
- High entry fees – low transaction fees
- e-Invoice as part of a total procurement package

This is called Islands of Procurement!

They can be national, regional or even local and domain specific

# Islands of procurement – a PEPPOL terminology





## 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
<b><u>CEF-TC-2017-1</u></b> BRIS EESSI eID & eSignature European e-Justice Portal	€2 million €17 million €7 million €1.5 million	17 February 2017	18 May 2017
<b><u>CEF-TC-2017-2</u></b> Cyber Security eDelivery eHealth eProcurement	€12 million €0.5 million €9 million €4 million	6 May 2017	21 September 2017
<b><u>CEF-TC-2017-3</u></b> eInvoicing eTranslation Europeana Public Open Data	<b>€10 million</b> €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

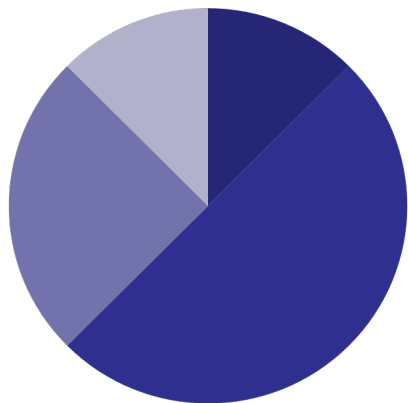
**Proposals received: 10**

**Eligible proposals received: 8**

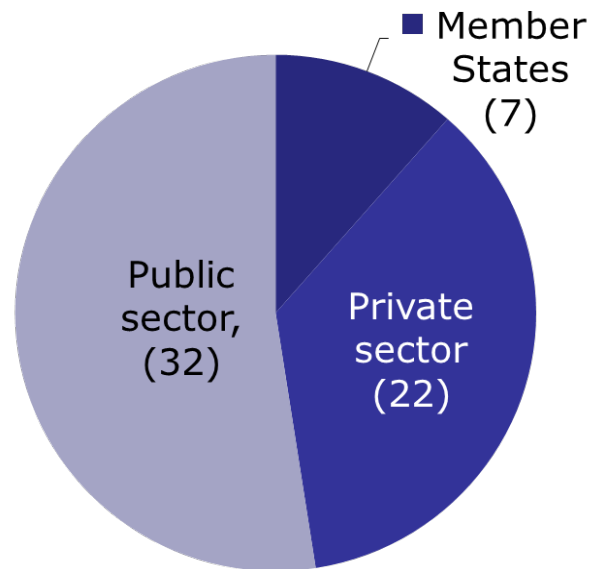
**Grant agreements: 8**

**Maximum EU contribution: €4,426,111**

# 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**

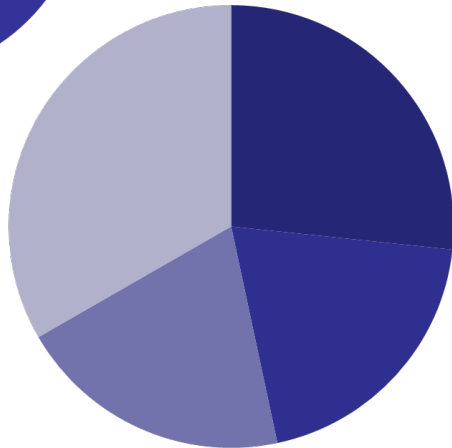
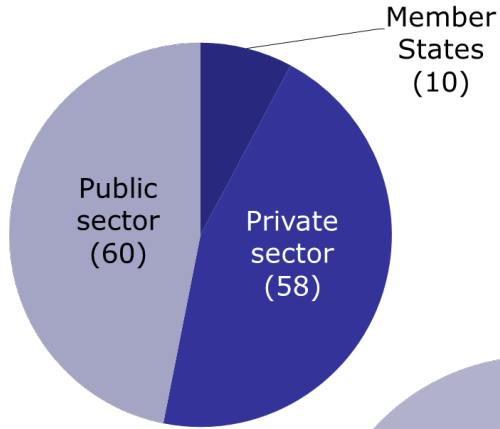
**Eligible proposals received: 20**

**Recommended proposals: 15**

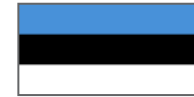
**Recommended funding: €10,401,818**

# 2016-3 eInvoicing call

## Member States involved (22)



- 5 members (4 consortia)
- 6 members (3 consortia)
- 7 members (3 consortia)
- 8 or more members (5 consortia)



---

## 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 compliant 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](mailto: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](https://twitter.com/inea_eu)**

## 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



The screenshot shows the CEF Digital website homepage. At the top left is the logo for CEF Digital, featuring the European Union flag and the text 'CEF Digital Connecting Europe'. To the right of the logo is a search bar and two buttons labeled 'MENU' and 'COMMUNITY'. Below the logo area is a dark blue header with the text 'CEF Digital' in white, followed by the subtitle 'Part of the Connecting Europe Facility (CEF) programme - enabler of the Digital Single Market'. The main content area has a white background and features a 'Latest' section with a yellow underline and the headline 'BRIS Now Live on the European e-Justice Portal'. Below this is a section titled 'CEF Building Blocks' with the subtext 'Build your digital service faster and cheaper and create a European digital single market.' This section contains six items arranged in a 2x3 grid: 'eDelivery' (Supporting electronic registered delivery of data and documents), 'eID' (Extending the use of online services to citizens of other EU Member States), 'eInvoicing' (Helping public entities adopt the European standard on electronic invoicing), 'eSignature' (Creating and verifying electronic signatures), 'eTranslation' (Exchanging information across language barriers in the EU Member States), and 'About the building blocks' (Learn more about the CEF building blocks). At the bottom of the page, there is a section for 'Sector Specific Digital Service Infrastructures' and an 'About CEF' section with a brief description of the CEF's role in supporting trans-European networks and infrastructures in transport, telecommunications, and energy.

## Contact us



CEF-BUILDING-BLOCKS@ec.europa.eu

© European Union, 2017. All rights reserved. Certain parts are licensed under conditions to the EU. Reproduction is authorized provided the source is acknowledged.

**Thanks!**