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# Table of contents

1 The PEPPOL project 6
1.1 Overview 6
1.2 Key challenges 7
1.3 Main achievements 8
1.4 Lessons learned 9
1.5 Alignment with EU strategy 9
1.5.1 EU 2020 strategy 9
1.5.2 A strategy for e-procurement 9
1.5.3 Single Market Act II 10
1.5.4 E-government Action Plan 10

2 The PEPPOL project activities and results 14
2.1 Background 14
2.2 PEPPOL solutions 14
2.2.1 Transport infrastructure 15
2.2.2 E-signature validation infrastructure 19
2.2.3 E-attestation (VCD) 21
2.2.4 E-catalogue 24
2.2.5 E-ordering and e-invoicing 25
2.3 Pilot implementation and support unit (ISU) 27
2.4 Dissemination and awareness 29

3 The PEPPOL impact 34
3.1 Impact on the society 34
3.2 Impact on key targets 37
3.3 Pilot coverage 42

4 How to Join the community 46
4.1 OpenPEPPOL 46

5 Consortium and contact details 50
5.1 Development of beneficiaries 50
5.2 Contact points: Head of Beneficiary (HoB) 51

ANNEX 1 – The PEPPOL EIA Repository and Toolbox 54
Section 1
The PEPPOL Project
The PEPPOL Project

PEPPOL removes the roadblocks to cross-border procurement, allowing any business to communicate electronically in procurement processes with any public authority in Europe.

1.1 OVERVIEW

Public sector contracts form a significant part of the single market, accounting for 19.7% of Europe’s GDP or nearly 2.400 billion euro, but businesses, especially small companies, can find the related paper work cumbersome. The problem is exacerbated if a company wants to expand its business outside national borders and bids for a contract in another country which may have different requirements and obstacles.

PEPPOL removes the roadblocks to cross-border procurement, allowing any business to communicate electronically in procurement processes with any public authority in Europe. It has been estimated that automating the procurement processes (from the publication of notices, access to tender documents, submission of bids, evaluation, and award of the contract, to ordering, invoicing and payment) in Europe would save between 50 to 70 billion euro every year. While many EU countries already use electronic procurement to make tendering of public sector contracts and their ordering and invoicing processes simpler and more efficient, most of these solutions are implemented solely on a national or regional level, each with their own separate systems and standards, unable to connect easily to each other.

PEPPOL solves these challenges by aligning business processes using common standards, addressing common legal issues and developing open source technologies. The project was jointly funded by the European Commission and a consortium of 18 government agencies from 11 Member States and associated countries: Austria, Denmark, Finland, France, Germany, Greece, Italy, Norway, Portugal, Sweden and the United Kingdom. Agreement on the common standards for document content and on the technical aspects has been reached through consensus amongst all consortium members and these standards have been piloted in countries outside the consortium as well, such as Spain, Ireland, Belgium and others.

In the procurement process leading to contract award (pre-award phase), PEPPOL offers a Virtual Company Dossier for suppliers to collect and submit company information (certificates, attestations and evidence information) in a standardised and therefore ‘re-usable’ format, an e-catalogue for use in the tendering process to submit product information, and a pan-European e-signature validation service. In the procurement processes following the contract award (post-award phase), PEPPOL compliant business documents such as e-catalogue, e-orders, e-invoices are exchanged through the open and secure PEPPOL network between sending and receiving Access Points for public sector buyers and their suppliers.

In the post-award procurement process, PEPPOL enables buyers and suppliers to exchange electronic business documents across Europe through Access Points (APs) over the PEPPOL network. These business documents can be validated and processed, using solutions implementing the mandatory PEPPOL Business Interoperability Specifications (BIS). Access Points are currently provided by both government agencies and private companies. The relationship between the AP providers is regulated through the PEPPOL Transport Infrastructure Agreements (TIA), establishing a many-to-many legal framework instead of the traditional bilateral agreements entered into between service providers exchanging business documents. Through this approach, PEPPOL enables interoperability (the ability of systems to exchange information, comprehend it and process it electronically). Thus, PEPPOL does not replace systems already in use – PEPPOL connects them. Once connected to the PEPPOL network, public sector buyers and their suppliers can communicate electronically with all others that are already connected.

PEPPOL components have been implemented successfully in 12 European countries to date, with 51 PEPPOL Access Points established and interest also increasing now from outside of the EU. Countries like Norway and Austria have recently made e-invoicing mandatory for public sector suppliers, referencing the PEPPOL e-invoicing specifications and network as an implementation method. Denmark and Sweden already have legislation mandating the use of e-invoicing. Through the Single Market Act II, the EC have initiated a process for making e-invoicing the standard invoicing mode for public procurement in Europe. By making e-invoicing mandatory for public procurement throughout Europe, the EC aims to make the public sector a ‘lead market’ for e-invoicing and spearhead its wider use
in the economy. PEPPOL compliant solutions have already proven their usability as a means to implement mandatory e-invoicing and it has also been demonstrated that the PEPPOL solutions can be re-used for exchange of business documents between private sector entities. Thus, PEPPOL is well positioned to support governments, businesses and SMEs to adopt e-invoicing and e-procurement solutions that work seamlessly across Europe.

As the PEPPOL project reached a successful completion, in August 2012, the OpenPEPPOL Association, comprised of public and private members of the PEPPOL community within and beyond the original PEPPOL project, has taken over the responsibilities previously carried out by the PEPPOL Consortium and began official operations on September 1st 2012.

1.2 KEY CHALLENGES

A multitude of different standards and formats in use for e-procurement

E-procurement is still in its infancy in Europe with many different formats and standards in use, which is typical during the early development stages of an industry. Public authorities (buyers) typically define the format or standard to be used when implementing e-procurement solutions but they often underestimate the complexity and costs for their suppliers who may have to accommodate different requirements for a wide range of public sector clients.

Every new format or standard requires training, understanding of new terminology, learning new codes, developing and testing new solutions, and then maintaining them. This can present serious investment and maintenance costs, for large multi-national companies or even service providers, depending on the number of standards supported. SMEs are often excluded entirely from any form of real end-to-end integration, having to settle instead for semi-automated document downloads that are typically printed and processed manually.

Lock-in solutions and isolated islands of e-procurement

Access to an e-procurement platform or simple exchanges of electronic documents may require both the public sector buyer and its suppliers to enter into a business relationship with the same solution/service provider. In a market dominated by non-interoperable or ‘closed’ networks, engaging with a number of trading partners can also mean entering into multiple agreements with different service providers, creating additional cost and complexity for all parties involved.

Many e-procurement solutions differ between national and regional governments or even between regions, creating isolated islands of e-procurement and market fragmentation. While roaming agreements exist between some of these service providers, the costs can be prohibitive and are reflected in the prices for end-users.

Lack of focus on the big picture and the myriad of isolated initiatives

E-procurement can be broken down into various components and phases, often resulting in solutions and standards that are implemented in isolation from the complete procurement cycle. E-invoicing is a key example where national and EU initiatives have focused primarily on the invoice and related VAT compliance without consideration for the bigger picture. The pre-award tendering process is often automated through internet portals where manual interactions are still required in order to obtain or submit documents. Initiatives often focus separately on B2G (business to government) vs. B2B (business to business) transactions, even though the private sector supplier has to accommodate both processes. The ultimate goal for buyers and suppliers should be to automate the entire procure to pay process using one single standard and one set of rules for compliance. The more points in the process that are standardised and automated (from tendering to payment application), the greater the benefits will be.

Milestones

- **PEPPOL operational**: 2008
- **Pilot production**: 2009
- **PEPPOL Roll-Out**: 2010
- **Launch of Open PEPPOL**: 2011

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European e-procurement standardisation
PEPPOL provides the standard specifications for electronic documents exchanged in the procurement cycle through which suppliers can do business with all public sector clients across Europe.

In particular, PEPPOL has developed Business Interoperability Specifications (BIS) for common e-procurement processes such as e-catalogue, e-orders, e-invoices, etc., based on the efforts of CEN (the European Committee for Standardisation), workshop on Business Interoperability Interfaces for public procurement in Europe (CEN BII).

PEPPOL BIS can be supported by any e-procurement solutions, working seamlessly across Europe, and can be re-used also in the Business-to-Business environment, reducing the investment needed for companies to implement different e-procurement solutions for public and private sector clients.

The backbone of e-procurement infrastructure
PEPPOL has developed an open and secure network, not replacing but connecting existing e-procurement communities throughout Europe, providing interoperability bridges that use the same standards-based communication protocols and reducing the number of network connections that suppliers have to support.

Access to the network takes place through PEPPOL Access Points and with just one single connection it is possible to reach everyone within the PEPPOL network. An organisation can enter into one agreement with the Access Point provider of their choice - independent of national borders. For example a UK company could use the Access Point of an Italian service provider to reach every other organisation already connected to the PEPPOL network. Once connected to PEPPOL, buyers can no longer impose solutions on their suppliers, providing freedom of choice based on real added value, thereby increasing market competition.

The governance of the PEPPOL network is regulated by the PEPPOL Transport Infrastructure Agreements and no transfer or roaming fees are allowed between PEPPOL Access Points, in order to level the playing field between large and small providers. Through its TIA legal and organizational basis, PEPPOL truly promotes the principles of the EU Single Market.

Regulatory developments in Member States
In Norway, the government mandated the use electronic invoicing incorporating the PEPPOL specifications for all central government entities and regional health entities on July 1st 2012. All suppliers selling to the Norwegian government must send their invoices electronically. The number of Access Point providers is increasing in Norway with over one thousand public and private organisations receiving PEPPOL compliant e-invoices, by October 2012.

From January 1st 2014, all Austrian suppliers (and foreign suppliers that have the technical means) of the Austrian Federal Government will be obliged to use e-invoices. The use of the PEPPOL Transport Infrastructure for sending e-invoices - based on PEPPOL specifications - is one of the two accepted methods of e-invoicing.

In February 2012, Ireland launched a series of PEPPOL e-invoicing pilots with seven public sector bodies taking part as follows: the Office of Public Works, the Department of Defence, the Department of Justice, HSE East, HSE North West, Enterprise Ireland and the Local Government Computer Services Board. Since Ireland was not a member of the PEPPOL consortium, the adoption of PEPPOL specifications for e-invoicing is the result of a market driven government decision.

Other countries are undertaking similar efforts, which may lead to official adoption of PEPPOL specifications. For example, Greece is discussing the adoption of a new national e-invoicing format that has been mapped to the PEPPOL BIS format.

European governments’ commitment to long-term sustainability
A number of governments and contracting authorities are fully committed to the long-term sustainability of PEPPOL, clearly reflected in their role in setting up the OpenPEPPOL Association. This entity, operational from September 2012, has taken responsibility for the activities previously carried out by the consortium members, moving PEPPOL from a large scale pilot project, towards market driven adoption.
1.4 LESSONS LEARNED

Integrated Strategy

The PEPPOL project and certainly other Large Scale Pilots (LSPs) and ‘e’ related initiatives of the European Commission would have benefited significantly from an integrated cooperation and communication strategy from the outset of the project. Opportunities to share information, resources, and even outcomes in terms of reusable technologies were missed until a much later stage of the project, at which point, much of the work had already been completed. A coordinated effort across LSPs is now in place and the benefits are already evident.

PEPPOL Reach

While a core part of the PEPPOL strategy was to enable cross-border e-procurement between the private and public sector, opportunities emerged throughout the project to re-use the PEPPOL solutions in pilots where exchanges were taking place across communities (i.e. e-procurement hubs, regional government agencies, unconnected Service Providers etc.) within a single country.

The shift from a “cross-border” to a “cross-community” requirement for pilots signalled a milestone in the project evolution, coming to realise that a cross-border market for public e-procurement could not be created by technology. Instead the current trade between organisations within and outside national borders should be supported and fostered with technology that PEPPOL has developed. Thus the need to connect the existing trade communities in the Business-to-Government (B2G) area resulted in the adoption of the wider “cross-community” approach which replaced a strict “cross-border” requirement for the PEPPOL Pilot Definition.

Similarly, during the stakeholder feedback process, concerns came from key eBusiness integrators in the private sector regarding the limitation in scope of the PEPPOL project as an initiative focused solely on the public sector. As many of the PEPPOL components were clearly reusable to support business-to-business (B2B) transactions, a communication was released to ensure the B2B community was aware of the long term plans for PEPPOL sustainability and reusability of its components in future B2B document exchanges.

1.5 ALIGNMENT WITH EU STRATEGY

1.5.1 EU 2020 STRATEGY

The EU 2020 paper – ‘A strategy for smart, sustainable and inclusive growth’ defines one of its seven flagship initiatives as the need for a ‘digital agenda for Europe’ through which the benefits of a digital single market can be realised. A second flagship initiative is ‘an industrial policy for the globalisation era’ and aims to improve the business environment, notably for SME’s and to support the development of a strong and sustainable industrial base able to compete globally. Both of these initiatives have linkages to PEPPOL, such as:

• The generation and acceptance of the PEPPOL specifications and processes for e-procurement tasks by the member states would further the ambition of the European Commission to achieve a digital single market.

• PEPPOL is targeted at the European industrial base, especially the SME’s, to assist them in engaging more effectively in the public sector procurement market across the member states. By implementing the PEPPOL initiative they will inevitably become more efficient and competitive and so be able to compete globally.

• The 2020 paper is an agenda for all member states but it recognises that there are different needs, different starting points and national specifics that must be taken into account. The PEPPOL concept aligns with this issue and allows implementation at the simplest level for both Contracting Authorities and Economic Operators, e.g. from browser access through all levels to the most sophisticated end to end, integrated e-procurement and supply chain management systems.

1.5.2 A STRATEGY FOR E-PROCUREMENT

The Commission communication on ‘A strategy for e-procurement’ presents the strategic importance of e-procurement and sets out the main actions through which the Commission intends to support the transition towards full e-procurement in the EU. In particular, the Commission recognises that in order to overcome the current barriers to e-procurement specific actions should be undertaken, such as:
• Creation of an effective legal framework requiring the European Parliament and the Council to agree, by end-2012, on a full transition to e-procurement. Where necessary, after the adoption of the new directives, the Commission might have to harmonise technical requirements via delegated acts.

• Support the deployment of e-procurement infrastructure, ensuring support for the sustainability of the PEPPOL components from mid-2012. The Commission has proposed to support the deployment of an e-procurement infrastructure across Europe via the Connecting Europe Facility (CEF), launching projects from 2014 – 2015, and will promote the use of Structural funds to foster e-procurement take-up across Europe.

• Monitor relevant standardisation work and promote international regulatory dialogues about open e-procurement systems.

The Commission strategy for e-procurement acknowledges the importance of promoting the implementation of cross-border e-procurement solutions and infrastructure through PEPPOL.

1.5.3 SINGLE MARKET ACT II

In October 2012, the Commission adopted the ‘Single Market Act II’ which builds upon the first Single Market Act and identifies four drivers for new growth around which to focus key actions:

1. Developing fully integrated networks in the Single Market
2. Fostering mobility of citizens and businesses across borders
3. Supporting the digital economy across Europe
4. Strengthening social entrepreneurship, cohesion and consumer confidence

The Commission recognises that additional efforts are needed to achieve quickly the objectives set in the Digital Agenda for Europe and the Communication on e-Commerce and Online Services. Progress in tackling the fragmentation of online services along national borders, addressing the high speed network investment challenge and reaping the benefits of paperless public administration are important next steps.

In particular in Key Action 10, the Commission plans to make electronic invoicing the standard invoicing mode for public procurement, stating that:

“A shift towards paperless public administration, particularly in its cross-border dimension, should be a mid-term objective for the European Union and Member States.

In addition, action is necessary to avoid the further fragmentation of the Single Market, due to the on-going establishment of national e-invoicing systems operating on the basis of different, often national, standards. This increases complexity and costs for firms entering into cross-border contracts with public authorities across the EU. The Commission will therefore propose concrete actions to achieve these objectives in 2013”.

In this regard, PEPPOL is the necessary reference point for cross-border electronic public procurement, which includes an e-invoicing component, so that any company in Europe can send PEPPOL compliant e-invoices to any public sector authority across the EU, as an integral part of the standards-based e-procurement cycle.

1.5.4 E-GOVERNMENT ACTION PLAN

The Commission Action Plan 2011 – 2015 ‘harnessing ICT to promote smart, sustainable and innovative government’ reemphasises the need for all public administrations to improve their efficiency and effectiveness through a constant effort to use e-government to reduce the administrative burden and improve organisational processes. One such area is the implementation of e-procurement processes for public procurement.

It is recognised in the Action Plan that the emergence of innovative technologies such as „service-oriented architectures“ (SOA), or „clouds“ of services, together with more open specifications which allow for greater sharing, re-use and interoperability reinforce the ability of ICT to play a key role in this quest for efficiency in the public sector.

The Action Plan is clear that in 2012-2014 member states should roll out cross-border services based on the results of PEPPOL.
From the key messages in the above papers the role of PEPPOL is best strengthened at the European and national level by speeding up PEPPOL adoption and related benefits, by:

- convincing other public and private organisations – in particular those accustomed to e-procurement - of the potential benefits, through relevant experience and case studies;

- clarifying the journey from their specific starting position based upon proven methodologies, focusing also on organisational and cultural change. The benefits of implementing e-procurement are only fully realised when changes in organisational processes occur in parallel to the application of new technology.
Section 2
The PEPPOL project activities and results
The PEPPOL project activities and results

Ensuring consensus and commitment of national and regional public authorities to create a common level playing field for their communities through administrative efficiencies, innovation and advanced research.

2.1 BACKGROUND

When the internet was first opened to the public, it was used initially as a method for governments and academics to exchange or share information across multiple locations. However, by the very nature of its standards-based open network, the Internet has completely changed the way in which the world communicates and does business. Many experts claimed at the time that it would never ‘work’ or reach mass adoption.

If we compare this to how e-business has evolved and has been led almost entirely by the private sector, we find mainly large corporations exchanging information with their high-technology enabled trading partners often using in-house or IT service provider developed systems and business specific formats. This has led to the development of a series of private networks and competing standards where organisations are grouped together in isolation of the wider market.

The missing element is Government involvement. In fact, in regions where the government has been actively involved in and encouraged eBusiness technology (e.g.: the Nordics), adoption rates are significantly higher as a result. Europe is lagging behind its own targets (with e-procurement being used in only 5-10% of procurement procedures) and internationally, where countries such as Korea, or Brazil, have reached mature e-procurement adoption levels.

While Europe presents a fragmented market, with countless local public administrations which are difficult to coordinate and monitor, the PEPPOL project has been strategic to ensuring consensus and commitment of national and regional public authorities to create a common level playing field for their communities through administrative efficiencies, innovation and advanced research. In particular, in providing SME access to a wider market of business opportunities, PEPPOL leads to a more sustainable economic growth.

The PEPPOL project set out to address both the technical and legal barriers to enable cross-border e-procurement, including secure data exchange supported by the validation of e-signatures. While PEPPOL promotes the use of common standards, it also provides components for standards conversion, enabling organisations that have invested in regional or national standards to take part in the initiative at any time.

The PEPPOL approach to business interoperability including its transport infrastructure can be re-used as a key component in a number of large scale eBusiness projects (e.g.: eFreight, eCodex, eCustoms, etc.), Funded by EU and the Member States. The PEPPOL transport infrastructure, based on an open 4-Corner model, opens up competition amongst IT service providers and removes roaming fees between providers, weakening the business reasons for having closed networks and lack of interoperability.

Widespread adoption of PEPPOL will encourage IT companies to embed the specifications and technology into their core ERP and packaged software offerings, to the extent that access to PEPPOL could become as easy as sending and receiving e-mails.

Moreover, the technology developed in the PEPPOL project can be expanded for use in the business-to-business environment, resulting ultimately in the mass adoption of an open and standards based e-business environment.

2.2 PEPPOL SOLUTIONS

PEPPOL facilitates the pre-award and post-award procurement process with standardised components by focusing on the most complex e-procurement elements (marked yellow in the graphic below):
In the pre-award phase, PEPPOL supports the public tender process with:
- validation of e-signatures based on electronic certificates issued by certification authorities
- a Virtual Company Dossier to submit a standardised structured package of company-related qualification evidence such as certificates, attestations and other documents
- an e-catalogue to submit offers about goods and services in a standardised format

In the post-award process, PEPPOL covers:
- the e-catalogue to exchange information about goods and services offered under a contract
- Post Award e-ordering and e-invoicing providing the buyer and suppliers with defined procedures to exchange common business documents

PEPPOL does not provide an ‘e-procurement application’ to produce or exchange documents, but instead provides an open and expandable transport network, some centralised directory and validation services, and a set of specifications for organisations or their service providers to adopt in order to exchange electronic information/documents seamlessly – within or across industries, regions, or borders.

PEPPOL’s success is based on a modular building block approach, where organisations can grow their PEPPOL usage together with their expanding capabilities in e-procurement. For example, businesses and government agencies can start with e-invoicing, and later extend to e-catalogues and e-orders. Use of the PEPPOL Transport Network is mandatory for the post-award processes only.
2.2.1 TRANSPORT INFRASTRUCTURE

Overview

PEPPOL’s transport infrastructure is based on a set of standardised communication protocols which ensure the interoperable, secure and reliable exchange of electronic documents between buyers and sellers within the EU. PEPPOL seeks to join the islands of e-procurement that currently operate across Europe by defining profiles based on common and nationally compatible standards and providing tools for interoperability, on both a national and cross-border scale.

Problem Statement

As e-procurement has evolved over the years, economic operators have adopted various e-Initiatives in order to automate transactions with their supply chain partners. However, the technologies used in these e-supply chains were based on the processes and data formats unique to their own communities, industries or regions. In many cases, these communities had no connections to companies and systems outside of their own, often ‘closed’ networks. Organisations exchanging electronic documents across the EU may have to enter into agreements with a multitude of service providers in order to reach a large number of clients. This creates additional cost, complexity, and leaves organisations with very little freedom of choice.

The European Commission realised the importance of acting early to avoid technical or operational barriers becoming endemic in the emerging e-procurement landscape and selected PEPPOL for funding in 2008.

Solution

PEPPOL enables the connection of existing e-procurement communities through ‘Access Points’, currently provided by both public administrations and private companies, using common and nationally compatible standards. Access Points share the same transport protocol and document format, using digital signature algorithms to...
secure the message content. In particular, the sender (a large corporation, an SME or a public administration) of an electronic document (e.g.: an e-invoice, an e-order or an e-catalogue), uses an Access Point to connect to the PEPPOL network, specifying the type of document being sent and the recipient who is uniquely identified in the network via a business ID.

In order to route the documents received from the sender to the correct recipient, the PEPPOL infrastructure maintains information on servers, called Service Metadata Publishers (SMPs). They store information about the receiving capabilities of the users connected to the PEPPOL network, provide details about the business document types supported, and the business collaboration profiles that can be processed through the national infrastructure. The PEPPOL Access Points must identify the correct connection in order to retrieve the information about a specific recipient party. The Service Metadata Locator (SML) contains the respective SMP for every business ID.

The concept is similar to how e-mails are currently exchanged across the internet, where a company engages with an Internet Service Provider (ISP) and is able to send emails to all other companies without having to enter into agreements with the ISPs of their many e-mail recipients or concern themselves with the details of how those messages will be received.

Access Point providers typically connect to their customers through their existing networks and use the PEPPOL Access Point to exchange documents with other Access Point providers. So the PEPPOL Transport Infrastructure can be considered as providing a ‘gateway’ or ‘bridge’ between specific e-procurement communities or service platforms.

**Key features of the PEPPOL transport Infrastructure:**

1. **BusDox, a Common Electronic Document Exchange Platform**
   PEPPOL uses a set of technical specifications known as BusDox (Business Document Exchange) to enable the secure and reliable exchange of electronic documents throughout the EU. By establishing a BusDox network for e-procurement, PEPPOL has actually created a common eBusiness platform for use by any European organization – both public and private, and for any PEPPOL BIS compliant electronic document.

2. **An Open 4-corner model**
   Access to the PEPPOL network is open to any contracting authority and economic operator in Europe. Communication takes place between two Access Points, respectively for the sender and the recipient organisation.

3. **Addressing Independent of Transport**
   PEPPOL designed the Universal Endpoint addressing scheme (UPIS) to allow any type of existing addressing scheme to be mapped onto the PEPPOL scheme. PEPPOL also uses a set of predefined document and process identifiers based on commonly accepted standards.

**Challenges**

- Reaching consensus on the architecture and associated legal agreements
- Having to provide sample code to be used by service providers and other implementers in an open and flexible manner to integrate with their existing platforms

**Achievements**

1. **Building the PEPPOL Network**
   The success of the PEPPOL network is apparent in the growing number of Access Points – 60 e-procurement Communities and 50 Access Points enabled, by August 31st, 2012 - with a marked increase in interested participants of all sizes, both within and outside of the EU.

2. **The PEPPOL Transport Infrastructure - Legal Framework**
   A significant achievement of the PEPPOL project is evident in the ability of its members, a consortium spanning 11 EU countries, to obtain consensus for the design and implementation of the PEPPOL legal framework and governance structure, which is now used in a larger number of countries. The PEPPOL legal framework was designed specifically to protect the core principles behind the PEPPOL Transport Infrastructure – a network which is based upon sending and receiving Access Points in an open and accessible ‘open 4-Corner model’ and to ensure the long term sustainability of the associated PEPPOL specifications.
The PEPPOL Transport Infrastructure requires that a number of actors work together in a trusted environment. To achieve this, two levels of governance are required as follows:

1. The PEPPOL Coordinating Authority has authority over all of the central components of the PEPPOL Transport Infrastructure (the technical and service specifications, the Service Metadata Locator, the Transport Infrastructure Agreements and its annexes) and will delegate authority over the implementation and use of the infrastructure within a defined domain to a PEPPOL Authority. The PEPPOL Community Agreement defines the general principles of cooperation between these two parties. As of 1st of September 2012, the role as PEPPOL Coordinating Authority is held by OpenPEPPOL AISBL.

2. The PEPPOL Authority must ensure Access Point (AP) and Service Metadata Publisher (SMP) services are provided in conformance to the technical standards and service specifications by entering into separate AP and SMP agreements with each of the respective providers within their domain. These providers also have the option of signing the AP/SMP agreements with the Coordinating Authority directly.

The PEPPOL Transport Infrastructure Agreements (TIA) includes three types of agreements:

- PEPPOL Authority Agreement
- PEPPOL Access Point (AP) Provider Agreement
- PEPPOL Service Metadata Publisher (SMP) Provider Agreement

The regime of agreements and the governance structure ensure that:

- the role and responsibilities of each actor are clearly described and openly available, making PEPPOL an open and transparent community
- sufficient information is made available through the SML/SMP, allowing a Participant to make this its sole source of information for conducting e-procurement with its trading partners.

Through these measures, a set of minimum requirements and criteria will be established and consistently applied throughout the full PEPPOL Transport Infrastructure.

![PEPPOL Governance Model](image-url)
**Key Benefits**

- Improved access across borders, technologies and industry groups increases business potential, collaboration and efficiency.

- Widespread connection to PEPPOL under a “connect once, communicate everywhere” principle creates a more competitive market for standardised e-procurement solutions and existing service providers can offer PEPPOL business processes as a value added service to their customers.

- PEPPOL’s open exchange infrastructure Access Points providers do not incur transfer or roaming fees, ensuring small providers entering the market have the opportunity to compete equally with the larger more established providers.

- Each organisation can enter into one single agreement and agree one set of terms with their chosen Access Point provider. Alternatively, an organisation is also free to set up and maintain its own PEPPOL Access Point.

- Once connected to the PEPPOL network, documents can be exchanged seamlessly between any or all organisations that are connected to the PEPPOL network, regardless of which Access Point provider they use or the country in which they or their provider resides.

**Lessons Learned**

Earlier attention to stabilising the reference implementations for Access Point providers would have saved time and energy for pilot organisations and likely improved adoption rates.

**Future Possibilities**

The BusDox specifications are document agnostic, meaning users can transfer any type of XML document between any network. In the first pilot phase of PEPPOL, a specific suite of business documents have been developed, thereby establishing a firm foundation for the possible extension of the network to support additional document types (always based on the cooperation with CEN, as the standardisation body and PEPPOL producing the BIS, as implementation guidelines).

The PEPPOL transport infrastructure may be used in several other areas of eGovernment including Large Scale Pilot and other projects such as health, justice and eID (Identity) in the future. It has already been adopted as part of the EC’s co-funded e-Freight project. Since governments account for 19% of EU GDP, the PEPPOL infrastructure has the potential to become the backbone for e-Procurement in Europe. While the initial focus is on the business-to-government sector, the PEPPOL infrastructure and its components can be used in the future by private sector companies, including SMEs, in a business-to-business environment.

### 2.2.2 E-SIGNATURE VALIDATION INFRASTRUCTURE

**Overview**

PEPPOL’s vision is to create interoperability between the different e-signature national schemes, so that a contracting authority can validate certificates issued in other EU member states, enabling electronic submission of tenders across borders. This means that an economic operator can use the e-signature of its choice when submitting an offer to any public sector awarding entity.

**Problem Statement**

E-signatures identify companies or single persons, allowing the receiver of a document to confirm the identification of the sender (authenticity) and provide assurance that the document has not been modified in transit (integrity). The originator of the document uses an e-signature issued by the relevant certification authority. The party receiving the document needs to know who issued the e-signature in order to validate it accordingly. These authorities may be public or private, national, regional or domain specific and use completely different standards and technologies in their signature creation processes, making validation and acceptance of each others’ signatures a problem.

**Solution**

PEPPOL solves specific problems relating to the creation, verification and acceptance of e-signatures accompanying e-procurement documents, to enable cross border signature validation.
The PEPPOL validation infrastructure consists of a network of federated validation services, able to validate qualified signature certificates from trusted certification authorities according to the national ‘Trusted Services List’ (TSL) and also non-qualified certificates, as long as they are accepted in certain procurement domains.

The work included identification of the technical criteria for validation, review of signature policies to define the acceptance criteria - taking into account the legal/regulatory requirements and risk assessment, computational correctness, validity of eID used, quality of certificate, approval status of the Contracting Authority (national/international), and cryptographic quality. The PEPPOL specifications enable services that ensure not only eID (identity) and e-signature validity but also acceptance according to the requirements of the receiving party.

**Key Components:**

1. PEPPOL Responder that validates certificates against configured Contracting Authorities.

2. PEPPOL Public Registry Service (PPRS) - a service that provides information about Validation Service Providers.

Results of the project include: the e-signature validation specifications, architecture and trust models, e-signature quality classification and associated policies, cross-border verification system, open source software components, implementation guidelines and online testing facilities.
Challenges

- Definition of a trust model for validation services
- Specification of a method for signing e-procurement data and validating
- Provision of solutions for verification of signatures
- Alignment of the requirements of the different member states and stakeholders
- Delay of the EC Trusted Service List

Achievements

The PEPPOL e-signature validation has achieved its goals and proven the usability in different pilot implementations. The following products or solutions are enabled with the PEPPOL e-signature validation solution:

- Two Norwegian and international e-procurement platforms
- Two French government e-procurement platforms
- German market leader for e-procurement platform
- German e-government middleware
- Polish trust service and validation authority provider
- The national VCD service for Greece

The effort for implementation and maintenance of the solution has shown to be reasonable, implying a low barrier to enter the e-signature validation infrastructure, from both a user and IT provider perspective. At the end of the PEPPOL project the e-signature validation infrastructure is up and running in production conditions and will continue to be maintained.

Although some high usage numbers are encountered in certain PEPPOL pilots, the overall demand for cross border e-signature validation is lower than anticipated and goes far below the capabilities of the possible infrastructure performance. However, the PEPPOL e-signature validation infrastructure has achieved full coverage of European Certification Authorities issuing qualified signature certificates.

Key benefits

- Signature validation service which can validate a high number of European digital signatures cross border.
- Quality classification of the digital signatures.
- High flexibility of the solution: It can be implemented in any scenario with digital signatures.
- Service providers can easily implement the solution and offer respective services and software.
- Contracting authorities can validate any digital signature.
- Economic operators can use their favoured signature solution

Lessons Learned

Stronger and earlier focus on coordination activities between the Large Scale Pilot projects of the EC (LSPs) would have been helpful. Guidelines should be developed regarding the use of common infrastructure components between future EC projects.

Future Possibilities

The operations of the PEPPOL e-signature central infrastructure component and the governance will be provided by OpenPEPPOL. Apart from the on-going usage in the remaining pilot implementations and future use in the open market, the PEPPOL e-signature validation service is currently and will be used by other EC Large Scale Pilot projects, beyond the procurement field without the need for adoption of the PEPPOL solution, as a stand-alone component.

For detailed figures on usage and enablement see http://www.peppol.eu/pilot-reporting/usage/pre-award-usage/esignature-usage and http://www.peppol.eu/pilot-reporting/infrastructure/pre-award-infrastructure/platforms-enabled-for-esignature-verification
2.2.3 E-ATTESTATION (VCD)

Overview

PEPPOL’s vision of the Virtual Company Dossier is to provide an interoperable electronic document solution that supports the exchange of evidences across borders during the qualitative selection process of public procurement.

Problem Statement

In the tendering process, economic operators must provide attestations in order to prove conformance to specific selection criteria. The criteria and types of evidence required vary between Member States, based on different national procurement laws. Without common standards, national tendering systems can not interoperate, creating complexity for economic operators, particularly SMEs who need to understand the foreign criteria and for the contracting authorities who have to evaluate the qualification documents. This results in paper-based, time consuming and error prone tendering processes.

Solution

The overall goals and expectations of the Virtual Company Dossier solution as set out in the description of work can be described as follows:

1. The VCD will support any authorised entities - economic operator, intermediary, contracting authority or IT service such as an e-tendering system - in creating an electronic information package consisting of the required documentation, evidences, proof, attestations, certificates, and declarations.

2. In order to create the VCD, an implemented IT system will have to collect certificates and attestations from existing registries. It also enables the economic operator to add self-declarations or other documents.

3. The VCD solution enables economic operators to produce and submit the required documentation - assembled as an information package - to any contracting authority in Europe.

4. In a similar way, the VCD as an implemented IT system will enable contracting authorities or their e-tendering systems to interpret and accept the documentation submitted by the economic operator.
5. Therefore the contracting authority must either specify the documentation that has to be submitted by the economic operator or the criteria of qualitative selection and exclusion that have to be fulfilled.

6. For all parties - economic operator, intermediary, contracting authority, issuing bodies - it is important that the VCD Service Providers are trustworthy; this implies that the services are precise, up-to-date, available and reliable.

In the overall PEPPOL context, the VCD addresses these goals by providing a solution for economic operators to create a VCD and to use it in order to qualify for public contracts within a country and across borders. The VCD specification and pilot implementation form a key building block for pan-European pre-award e-procurement.

**Challenges**

- language barriers, need for common terms, definitions and domain knowledge
- lack of standardisation and compatible data exchange formats
- no common understanding of national procurement legislation
- diversity of certificates, attestations, awarding entities and market players

The PEPPOL VCD provides solutions to overcome these challenges by achieving interoperability at the legal, organisational, semantic, and technical levels in cross-border tendering procedures, providing a common understanding of national procurement regulations.

**Achievements**

A key achievement was the creation of the legal rule set regarding qualifications and the machine-interpretable knowledge of country or individual participants, based on the procurement regulations of the participating Member States and the European procurement directives. The achievement of legal interoperability created through this innovative technology has also been reflected in other VCD functions including the selection, collection and packing of the necessary certificates.

Other achievements include the VCD reference implementation which provides very helpful tools to build and adopt the VCD solutions and the VCD schema specification with its related artifacts (the concept database, data model and code lists).

**Key benefits include**

- Reduced transaction costs, improved quality and accuracy of qualification information, more reliable and secure electronic document exchange
- Simplified creation and submission for public tenders across borders
- Easier interpretation of laws through transparent criteria-to-evidence mapping
- Decision support for economic operators in selecting appropriate evidences
- Ready-to-use Open Source software that can be integrated into existing systems

**Lessons Learned**

Wider coverage of existing business processes could have been included, in particular the electronic definition of qualification criteria used by contracting authorities. A stronger focus was needed on central governance and maintenance while working towards a more decentralised deployment.

A key finding from actual piloting was that the VCD has a strong potential to be used in post-award situations, as the need to refresh company-related qualification evidence is an ongoing requirement for contractors. The use of VCD has been found to be easier in post-award, with fewer barriers to overcome when the supplier is known, than in pre-award when the awarding process is more sensitive and critical.

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1. eCertis (www.ec.europa.eu/markt/ecertis) is a guide to the different documents and certificates frequently requested in procurement procedures across the 27 Member States, two candidate countries (Turkey and Croatia) and the three EEA countries (Iceland, Liechtenstein and Norway). Economic operators that wish to submit a proposal in response to a foreign Call for Tender and Contracting Authorities that have to evaluate a foreign tender are supported by eCertis to understand what information is being requested or provided.
Future Possibilities

The VCD could be improved by including more Member State domains, better decentralisation of the system capabilities. For eCertis in particular, there is an opportunity for DG MARKT to offer a more robust and useful automatic service by adopting the VCD approach, thereby becoming able to play the authoritative role on cross-border document equivalence.

Existing solutions such as, the VCD and pre-qualification bodies or other qualification initiatives (e.g. lists of approved economic operators) should be aligned within the different Member States for broader use and acceptance of electronic qualification solutions throughout Europe. Artifacts and components should be upgraded in tandem with the CEN BII, thus further coordination with CEN BII and other EU initiatives is recommended.


2.2.4 E-CATALOGUE

Overview

PEPPOL’s vision is for any company in the EU to easily, securely and seamlessly create, validate and send an electronic catalogue of goods and services offered, either as part of a procurement tender issued by any European contracting authority or in response to an awarded contract.

Catalogues are used by economic operators to describe goods or services offered for sale and may be used by contracting authorities to source goods or services, or to obtain product or pricing details. They can be a component of the pre-award tendering process or the post-award purchasing process.

Figure 6: PEPPOL Pre-Award processes
**Problem Statement**

The lack of common standards across Europe for e-catalogue formats and content creates difficulty in exchanging detailed accurate product information in cross-border transactions, resulting in duplication of effort and misunderstandings between Economic Operators and Contracting Authorities.

**Solution**

PEPPOL’s e-catalogue component focuses on common data structures and classification schemes. While the purpose and content of pre and post-award catalogues may be different, many structures and classification schemes can be shared. Results included:

1. E-catalogue specifications for pre and post-award cross-border procurement, based on the work carried out in the CEN BII workshops
2. An open platform for document exchange via the PEPPOL transport infrastructure (for post award e-catalogues)
3. Pilot evaluation guidelines and testing facilities
4. Development of open source software components and demonstrator tools
5. Tools to support the creation/visualisation/validation of pre and post-award e-catalogue
6. Documented benchmarking and best practices

PEPPOL enables interoperability of e-catalogues by lowering the organisational, semantic and technical barriers.

**Challenges**

- Lack of a clear legislative framework regulating the use of e-catalogues in pre-award tendering at the EU level.
- The CEN BII profiles, upon which PEPPOL specifications are based, did not have an existing e-catalogue profile that could be used.

**Achievements**

The experience of the PEPPOL project has shown that the full interoperability of Pre-award e-catalogues between administrations and suppliers is technically feasible. The specifications and components have been implemented in several national platforms and successfully tested in cross-border transactions.

At the format level, the technology is mature for wider adoption in the pre-award scenario; however the level of investment required by end users may see greater adoption in centralized platforms and platforms operated for a large number of public administrations; for reopening of competitions under framework agreements or dynamic purchasing systems.

At the content level, the project has demonstrated the technical feasibility of interoperable e-catalogue item description. However, wider adoption would require conditions that are not yet fully existing, for example the widespread use of common classification systems, and dictionaries that describe the properties of goods and services that are included in e-catalogues.

**Key benefits**

- Improved efficiency through standard e-catalogue formats and standardised descriptions of tender objects.
- Increased competition in tendering and purchasing through cross-border e-catalogue exchange capability.

**Lessons Learned**

While the lack of current EU level legislation presented an opportunity to develop the solution freely, it made it more difficult to find a solution that would satisfy everyone. The new provisions of the draft Public Procurement Directive may provide clarification on the cases where e-catalogues can be used.
**Future Possibilities**

As the full benefits of e-catalogues depend on the maturity of a number of conditions including the legislative framework and increase in shared services, it is unlikely to reach its full potential in the near term, however, PEPPOL has certainly provided a valuable contribution in proving the technical feasibility, and in bringing forward the debate.

Some re-adaptation work will be necessary after the project end, to take into account the evolution of pre-award e-catalogue documents within CEN/BII in parallel to the PEPPOL project and to consider any changes that might be required from the revised Public Procurement Directive.

In addition, the sharing of work done by other administrations to describe the technical properties within certain public procurement tenders needs to be further investigated.

### 2.2.5 E-ORDERING AND E-INVOICING

**Overview**

The PEPPOL vision is to develop solutions that make it possible for economic operators to exchange cross-border electronic orders and invoices with any contracting authority within Europe.

Electronic ordering is the automated process of sending, receiving, acknowledging and processing of orders for goods or services while electronic invoicing is the automated process of issuing, sending, receiving and processing of invoice data by electronic means.

**Problem Statement**

Orders and Invoices are key parts of the ‘procure to pay’ process, however e-invoicing in particular is governed by legislation that differs between countries and may be subject to processes and standards specific to regions or industries, creating barriers to cross-border trade. There is a strong desire from both Contracting Authorities and Economic Operators to achieve efficiency across the procurement process though automation. This requires a specific structure ensuring the flow of information between different parts of the process and specific models, ensuring data synchronisation.

**Solution**

To realise this vision, the solution architecture was developed using the eDelivery component of the PEPPOL Transport Infrastructure where organisations as ‘senders’ can transmit e-orders or e-invoices to a PEPPOL Access Point of their choice, where validation and data translation (if necessary) to the PEPPOL compliant format takes place before transmitting the order or invoice documents to the receiver’s Access Point. The receiver’s Access Point re-validates the documents before transmitting on to the receiver’s system in order to be processed automatically.

The PEPPOL project results include:

1. E-ordering and e-invoicing specifications (known as PEPPOL BIS) for cross-border trade based on the work carried out in the CEN BII workshops
2. An open platform for document exchange via the PEPPOL Transport Infrastructure
3. PEPPOL evaluation guidelines and testing facilities for organisations piloting the solutions
4. Development of open source software components and simple demonstrator tools
5. Documented benchmarking and best practices

**Challenges**

- Creation of the order and invoice profiles in accordance with the different national legislation, to ensure compliance
- Finding common ground on key information required, for example: company identifiers

**Key benefits**

- Economic Operators and Contracting Authorities can use a single data format to exchange documents with each other and with any organisations that are connected to PEPPOL
• PEPPOL provides simple and accessible Open Source software solutions enabling organisations - whether SMEs or IT software or service providers - to develop their own e-invoicing PEPPOL compliant systems.

• PEPPOL provides the opportunity for contracting authorities and their suppliers to expand their e-procurement access to the wider EU market, benefiting from increased opportunities and efficiencies.

**Lessons Learned**

While working on complex cross-border collaboration projects, frequent meetings in person are needed to eliminate any misunderstandings that can easily arise through written dialogue. Net-meetings and email have limitations when it is absolutely necessary to obtain consensus.

**Future Possibilities**

The PEPPOL e-order and e-invoice specifications could be expanded as new countries become interested, as legislation changes, or more detailed procurement processes evolve, however all changes must be made in accordance with the work carried out in the CEN BII workshop or related CEN standardisation work.

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**Figure 7: PEPPOL Post-Award Processes**


2.3 PILOT IMPLEMENTATION AND SUPPORT UNIT (ISU)

Overview

The International Support Unit (ISU) was established in 2011 as part of the transformation of PEPPOL from a technical to a business oriented project and was built on a combination of a centralized core team of dedicated IT professionals with the help of an ad-hoc team of experienced PEPPOL project members from the Consortium country teams, providing first level support to their own pilots or technical assistance as necessary.

The overall aim of the ISU was to lay the foundation for successful execution of PEPPOL pilots by providing goal oriented and professionalized support to the pilot execution, during pilot establishment and implementation. The task focused on coordination of the local pilots’ initiatives, monitoring of pilot execution, providing pilot-specific contingency planning and risk mitigation as well as consolidated overview of pilot performance.

Problem Statement

Before the ISU was formed, most pilot support was provided by experts actively participating in the PEPPOL work packages. While this setup provided the shortest possible path between the support requestor and the expert group, it did not scale well for an increase in piloting activities or for a market uptake of the PEPPOL specifications, and did not necessarily provide transparency about issues and recommended solutions. Reporting on pilot recruitment and implementation activities was inconsistent and success therefore difficult to measure effectively: contracting authorities who have to evaluate the qualification documents. This results in paper-based, time consuming and error prone tendering processes.

Solution

The Global ISU team operated within four main areas as follows:

- **Global recruitment**
  - Identification and help for prospective pilots

- **Task Force**
  - Hands on assistance to on-going Pilots in troubleshooting root cause analyses

- **ISU Support**
  - A help desk that acted as a connection between pilots and technical experts and provided task-based assistance to pilots

- **Strategic ISU**
  - Strategic help to PEPPOL management and technical work packages to define and document Pilot implementation processes, release management processes, Artefact evaluations, and Pilot evaluation reports

The Global Recruitment Team was responsible for recruiting new pilot participants primarily in countries not participating directly in the PEPPOL project, as free market pilots. The Recruitment Team managed the pilot relationship from first contact to PEPPOL and during the commitment and implementation phase.

By creating a highly organised support structure the ISU was able to provide professional help for interested pilot organisations. This included getting pilots running, coordinating contact between pilots and technical work packages, and qualifying material from the technical work packages, before it went to production pilots.

The work done by the ISU team, focused on formalising and professionalising the experiences in a way that they could be used as guidelines for future work on the PEPPOL project when responsibilities are transferred to OpenPEPPOL, as well as in future large scale projects.

Challenges

- Developing the ISU late in the project timeline meant that existing lines of communication needed to be re-established.

- The learning curve was steep – requiring six months to get the ISU up and running, including the change management process to ensure a smooth handover.

- Not all PEPPOL software was completely ready for production scenarios and technical support faced challenges in delivery, thereby affecting recruitment activities.
Achievements

The development of the PEPPOL Pilot Lifecycle Management Methodology (PPLM), a structured framework for implementing PEPPOL pilots as well as for supporting these pilots during implementation has been a significant element in achieving the overall goal of launching PEPPOL Production Pilots in the lifetime of the project. While providing support and assistance to Pilots, the Global ISU has been building bridges and filling in gaps in order to obtain success for pilots as well as for the PEPPOL project in general. The main part of the bridging effort has been focusing on strengthening collaboration between pilots and technical work packages, in order to speed up trouble shooting and artefact innovation by use of participatory development, and pilot driven improvements. The gap filling part of the ISU work has been focusing on providing services and activities needed in order to recruit, onboard and support Pilot participants with no beneficiary attachment.

Key benefits

• Making it easier for interested organisations to commit themselves, i.e. showcasing clear communication lines within the project and making clear to the pilot where to ask for help and where to report findings.

• Providing ongoing monitoring and support throughout all phases of the technical and business pilot enablement.

• Qualifying software from technical work packages, by handing over findings from pilot projects for work packages to use, thereby making it easier for future pilots to interact with already existing software and directing the work packages in the direction the pilots need.

• Controlling release management, in a way that is beneficial for both work packages and pilots.

• Acting as a link between open source software / research and development on the one hand the pilot experience on the other hand.

Benefits of providing front line support included

• Single point of contact for PEPPOL pilots, monitoring and follow-up on issues with a structured approach.

• Scalability of the support organisation to ensure technical subject matter experts are only drawn upon when needed, enabling cross-functional support, with a clear delegation structure and division of responsibility.

Achievements of Recruitment

• Extended discussions with Russia regarding possibility to interlock with PEPPOL and join OpenPEPPOL

• Identification and start-up of potential pilots outside the reach of the PEPPOL consortium: Scotland, UK, Ireland, Spain, Germany, Portugal and Lithuania

• Transparency in documentation and tracking of progress within the recruitment team

• Knowledge about Access Point Providers services, disseminated to potential pilots

• Substantial increase in the number of organisations expressing interest in piloting PEPPOL solutions

Lessons Learned

In future pilot projects a support organisation has to be established on day one to harvest the full potential of its existence. It could take up to six months, to get an ISU fully up and running, with structured process methods and tools, fully integrated in the overall project governance structure and collaboration process. Specific knowledge is required to lay the groundwork for the type of support needed, as well as to ensure adoption of the collaboration model is realised. Furthermore it is recommended to implement a task force focused on piloting support and on-boarding as a permanent element in future operations and initiatives.
Following the experiences from PEPPOL, the structure of such a large project, in some ways makes it incompatible with the smaller problems that production pilots will encounter. Large development projects such as PEPPOL will necessarily acquire a rather rigid structuring of resources and a straight line of development.

Helping organisations through implementation requires a mix of competencies to understand the problems of the pilot, both in terms of technical assistance as well as getting the right help when needed. A support and onboarding task force should be able to assist and complement resources in the organisational structure of implementers by drawing on specific resources as needed.

### 2.4 DISSEMINATION AND AWARENESS

**Overview**

Prior to December 2010, the PEPPOL project focused mainly on the research and development activities carried out in the initial phase by technical resources. PEPPOL specifications were then stable and the pilot implementation process became easier when compared with the initial effort required.

In spring 2011, the dissemination team defined clear objectives to build awareness of PEPPOL throughout the EU, shape market perception and build momentum for PEPPOL adoption while fostering confidence and trust amongst PEPPOL stakeholders. During the summer of 2011, a new unit was established to enhance recruitment activities and support pilot implementations. Tracking and reporting of activities was set up and more clarity regarding the actual implementation developments and issues was achieved.

The core communication strategy was to educate stakeholders and market influencers on the achievements and continuing progress of PEPPOL, highlight the benefits to users and governments, and work in tandem with EC and national communications organisations to increase awareness of PEPPOL. At the time, PEPPOL was considered as being ‘undersold’, particularly when compared to other Large Scale Pilot projects, and a decision was taken to intensify communications efforts.

The dissemination plan included development of key PEPPOL messages, fact sheets and presentations, an operational guide (the PEPPOL Starter Kit), a PEPPOL video, ongoing publication of PEPPOL news stories, case studies and success stories, distribution of a newsletter, quarterly stakeholder feedback interviews, and an update of the PEPPOL website content to present a more user-friendly source of information about the PEPPOL project activities.

The strategic study ‘The PEPPOL Business Case’ provided the opportunity to assess the market perception and concerns about PEPPOL, by gathering a wide range of stakeholder feedback, clarifying misunderstandings and receiving valuable input on how to improve the project developments. Additionally, taking into account the growing number of organisations interested in setting up PEPPOL Access points during 2011, a specific document was published, ‘How to become an Access Point provider’, covering legal, organisational and technical aspects.

PEPPOL targets included the IT industry with a focus on e-procurement service providers, public authorities including regional governments and universities, and private industry influencers across various business sectors. Channels included the PEPPOL website, the LSP Webzine, social media sites, online magazines and portals dedicated to e-procurement, e-invoicing, Supply Chain, specific industries and technology.

While the continuous flow of PEPPOL success stories and individual country-based announcements increased external interest and confidence in the project, two PEPPOL groups that had been formed on LinkedIn, in particular, the OpenPEPPOL eDelivery Forum quickly became a forum for exchanges of technical advice and information between PEPPOL pilots and a growing channel for spreading momentum about upcoming PEPPOL events. The main PEPPOL LinkedIn group membership is steadily growing with over 960 members at present.

Further interest in PEPPOL was evident by the popularity of the 7th PEPPOL Conference in Rome at the end of May, 2012, where 300 participants attended to hear key project achievements and establishment of OpenPEPPOL to further the long-term adoption of the next generation of interoperable e-procurement solutions.

**Challenges**

- Some resistance to change from an R&D phase of an IT project, focused on internal public sector needs, to a market oriented project where external stakeholders / pilots needs and challenges had to be taken into account;
• From 2011, extremely tight deadlines were necessary to swiftly prepare dissemination and recruitment strategy, methodology, pilot requirements and supporting material, impacted by long approval processes;

• Very low PEPPOL awareness and misunderstanding about the activities, expected results of the project and concerns about future governance of the network;

• Low numbers of pilot implementations and initial instability of the specifications made it difficult to recruit new pilot organisations, as the implementation risk was higher;

• During 2011, re-organisation of the PEPPOL recruitment team and delays for the pilot support unit to be fully operational, continued to represent a challenge for recruitment activities to ensure smooth transition during an already challenging period;

• Different levels of commitment from national teams, sometimes focused only on national matters.

Strengths

The most important strength and success factor for PEPPOL - all of its teams and results - relates to the people who have been involved throughout the life span of the project. These are visionaries, practitioners and experts, with strong focus on realising the vision and great understanding of stakeholders needs, committed and capable of dedicating all necessary efforts to succeed. Other relevant strengths include:

• Unique value of the project for its potential to achieve interoperability and standardisation in e-procurement and eBusiness – communication messages therefore focused on these benefits for the main targets;

• Excellent project leadership which proved to be invaluable for the re-organisational change during 2011 and for the long term sustainability, providing relevant guidance also to PEPPOL recruitment and Communications teams;

• Flexibility of the international marketing team to make decisions and implement changes;

• Support from the Commission to “sell” the project in coordination with other LSPs, which represented a strong push to focus even more on communication.

Lessons Learned

Skilled communication and sales people are necessary in IT oriented projects, from the early stages, defining the strategy and exchanging views on market needs with technical developers. Market engagement is required in order to ensure that business requirements (in particular SMEs requirements) are fully considered, to be reflected in technical specifications and solutions. Higher priorities to marketing and sales should be given from the beginning of the project.

The year 2011, particularly during the first 6 months have been dedicated to establishing all the necessary activities, processes, teams, supporting material and channels for marketing and recruitment purposes. This preparatory phase should have taken place earlier in the project, during 2010, so that 2011-2012 could have been used to actively communicate to stakeholders, attracting pilot organisations and achieving higher adoption rates and maturity of the components.

An agreed project development and market engagement strategy was needed at the international level from the beginning of the project;

National teams joining the project in later phases, set up very complex pilots which should have been avoided.
Section 3
The PEPPOL impact
The PEPPOL impact

A common set of interoperable and standards-based components deployed across the EU, providing the foundation for the next generation of pan-European e-procurement software solutions

3.1 IMPACT ON THE SOCIETY

The impact of PEPPOL on the society is assessed by analysing five common themes which are basic social infra-structural characteristics and goals of contemporary European societies.

The domain analysed is e-procurement, as part of the wider area of ICT for innovative government and public services, where PEPPOL substantially contributes to realising the objective of developing a comprehensive, coherent, reusable and interoperable set of European public services building blocks.

1- Rationalization (efficiency, effectiveness, innovation)

Analysing rationalization means to look for e-procurement objectives in the EU and how these are supported by PEPPOL results.

“The EC has put forward an ambitious proposal to modernise the EU’s public procurement legal framework. One objective of this proposal is to achieve a full transition to e-procurement in the EU by mid-2016, where the ultimate goal is ‘straight through e-procurement’, with all phases of the procedure, from notification to payment, conducted electronically. This will maximise the efficiency gains of e-procurement for the public sector and allow European companies – especially SMEs – to exploit the full benefits of the Digital Single Market”.

PEPPOL technology has focused on the most critical e-procurement phases and tools, in the more complex cross-border context. The project has delivered solutions to validate e-signature certificates from any Certification Authority in the EU, provided opportunities for companies, especially SMEs, to prepare and submit a single Virtual Company Dossier (including electronic company attestations and qualifications) to reply to tenders in Europe; to exchange electronic catalogues before and after the awarding phase; and to exchange electronic orders and invoices, re-using the data from the e-catalogue, thus ensuring ‘straight though processing’ and related efficiencies.

PEPPOL has been effective in overcoming the barriers that are hampering e-procurement uptake:

1. Inertia in adopting e-procurement

PEPPOL Consortium members have been active users and promoters of e-procurement solutions. PEPPOL implementations have involved governments and contracting authorities which have updated and/or implemented the PEPPOL interoperable components. PEPPOL recruitment teams have persuaded hesitant purchasers and suppliers in adopting the technology.

2. Market fragmentation

PEPPOL has created a common set of interoperable and standards-based components deployed across the EU, providing the foundation for the next generation of pan-European e-procurement software solutions, lowering the barriers to adoption and implementation costs. PEPPOL has connected the isolated e-procurement platforms of several governments, facilitating access for suppliers to a wider EU public procurement market, through a single Access Point, which they can freely choose amongst all of those currently offered by several service providers.

PEPPOL solutions have brought forward technological innovation but also supported organisational innovation. In particular, PEPPOL specifications cover organisational interoperability aspects - organisation / business and process interoperability - describing the way business partners collaborate to play their respective roles and

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2 The approach used to assess the social impact of PEPPOL has been derived from the ‘Study on the Social Impact of ICT’ (CPP N°55A – SMART N°2007/0068) – Final Report D7.1 (30.04.2010)

share responsibilities to achieve mutually agreed goals, with the support of their respective information systems.

2- Networking

Transformative effects of PEPPOL occur in the relations built and the resources who have interacted during the project lifetime, this is to say: in changes in social capital.

The PEPPOL impact on social networks in the e-procurement domain is influenced by:

1. **The PEPPOL social capital: relations and resources (people)**

PEPPOL relations are maintained through channels such as social media, newsletters, events, quarterly stakeholder feedback, (net-)meetings, and working groups.

Among the various social media channels, the most used is LinkedIn. The PEPPOL LinkedIn group ranks as the 2nd largest e-procurement community, with over 960 members, while considering that the largest community covers also traditional procurement matters, not only e-procurement. An additional LinkedIn ‘OpenPEPPOL eDelivery Forum’ has been set up, specifically to address developers’ needs. With over 200 members, this community represents an important meeting point to discuss open issues and find mutual support in implementing the PEPPOL solutions. This Forum will prove to be valuable especially for OpenPEPPOL, where the implementation support will be provided mainly by the open community rather than by internal resources.

Newsletter: with a database of over 1,500 contacts - composed of people who have participated in conferences and have expressed interest in receiving PEPPOL information.

Events have contributed to increasing PEPPOL awareness and have provided networking opportunities which resulted in important shifts in the market perception of the project. PEPPOL has focused participation in events targeted to EU policy makers and government representatives, e-invoicing market, e-procurement and ICT industry players.

Through seven conferences, PEPPOL has involved hundreds of resources from several countries, also outside of Europe, participating from the different stakeholder groups. The first and third PEPPOL conferences had a mainly technical focus, while the 2nd conference focused mainly on public procurement issues. The 4th, 5th and 6th conferences combined the high level e-government/e-procurement approach with more technical sessions, while the 7th conference also gave room to present the other EU co-funded Large Scale Projects as part of the EC roadmap series.

Another example is the close relationships and cooperation maintained with standardisation bodies and initiatives. The most important partners of PEPPOL in this context are the CEN⁴ workshop on Business Interoperability Interfaces in Public Procurement in Europe (CEN BII) and OASIS⁵ technical committee BDX/BDXR⁶. This cooperation has resulted in stronger market recognition and supported the achievement of wider consensus about the results of the project. PEPPOL resources also contribute directly to the work of standardisation bodies, ensuring that the PEPPOL specifications always take into account changing market requirements.

The PEPPOL Dissemination team has proved to have the necessary skills to build a positive market perception of the project results, triggering interest from a variety of stakeholders, expanding relationships, always keeping intact the PEPPOL vision, its messages and with a clear focus on the key targets, leveraging on the right channels. Close communications with EU institutions and policy makers have contributed to fostering PEPPOL awareness and clarify its strategic value for standardisation of e-procurement.

2. **The PEPPOL network and solutions (technology)**

In terms of social capital, the impact of networking in the e-procurement domain can be represented by the relations created between organisations (and related resources) that adopt the same technology.

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⁴ Committee for European Standardisation) (CEN) - http://www.cen.eu/cenPages/default.aspx
⁵ The organization for the Advancement of Structured Information Standards (OASIS) is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society - https://www.oasis-open.org
Therefore, when evaluating the impact of PEPPOL on social networks, the role of Access Point providers which are currently connecting organisations all over Europe has to be taken into account.

The ‘network effect’ also relates to enablement of buyers and suppliers, which gain increasing benefits as the number of connected and integrated trading partners increases. The current PEPPOL enabled organisations are pro-actively looking to onboard their supply chain partners, in order to maximise efficiencies and savings.

e-Freight, the EU-funded research and development project that aims to enable paperless freight, transport and logistics in a co-modal context, selected, after investigating alternatives, the PEPPOL transport infrastructure for electronic information exchange.

Broader Impact at EU Level:

- Collaboration with SPOCS which uses the PEPPOL e-signature validation infrastructure in its pilots, with the same governance model
- Coordination with e-CODEX, which will use the PEPPOL e-signature infrastructure, stating the usability of the solution.

3- Empowerment and participation

PEPPOL is empowering e-procurement users to actively participate in the governance and continuation of the agreement infrastructure, through the establishment of OpenPEPPOL, a new organisational structure that is emerging to support PEPPOL sustainability, creating new roles, functions, organisational positions of people working in the e-procurement domain.

The OpenPEPPOL Association will provide the authoritative point of reference for the interoperable PEPPOL-compliant network and organisations that use it, fostering a market driven adoption phase. The organisational structure includes coordinating communities that will be composed by committed organisations, increasing participation.

PEPPOL is therefore changing the relationships between governments, businesses and the ICT industry, providing OpenPEPPOL members with the opportunity to shape the future of e-procurement solutions to take into full account the most up-to-date business requirements.

What is already evident is a bottom-up trend in terms of shift of power triggered by a few SMEs in the ICT industry which are some of the most active participants and supporters of the PEPPOL community. These companies have been the first adopters of PEPPOL technology and contributed to its developments, as part of the open source community. The people involved are among the top experts and technical people in Europe.

The main reason for being involved is that small IT companies have serious challenges in competing with large network operators in the e-procurement domain, who tend to secure the high volume transaction clients. PEPPOL provides the launching pad and a level playing field for small ICT companies to access the open network and compete in the wider European market, enabling buyers and suppliers with PEPPOL-based solutions.

PEPPOL provided a constructive response to the EC Green Paper on e-procurement, while project representatives actively participated in the public hearing on how to expand the use of e-procurement in Europe. The PEPPOL e-signature team also provided input to the EC public consultation on eID and e-signatures.

4- Social capital

“Social capital is defined here as ‘... the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit’. High stocks of social capital in a particular society, nation state, region or local community are associated with relative ease of the sharing of knowledge and expertise, with community building and social cohesion’.

Organisations and people who have implemented the PEPPOL solutions in their information systems had to share information about their common business processes, rules, level of automation, clients/suppliers based across Europe, etc. in order to be effectively

supported by the PEPPOL resources. Information about how to connect to PEPPOL, exchange PEPPOL compliant business documents, integrate systems has also been shared. Developers have been improving constantly the technical specifications, making them stable and easier to implement.

Expertise and insight into PEPPOL solutions has grown steadily in the European business society, creating bonds between people living in different countries and working in a variety of industries that support each other on a daily basis to gain better understanding of the technology, solving issues, improving the user experience in order to better integrate their organisations digitally. The sum of all this represents the PEPPOL social capital.

Market consensus in the relevant e-procurement communities about the added value of PEPPOL has been achieved, especially in the last 12 months of the project. These results have emerged from feedback received during conferences, gathering quarterly stakeholder feedback, and from policy makers and European governments including the use of PEPPOL in their legislations and recommendations, in particular in Norway, Austria and Sweden.

5- Information and Lifelong learning

The contribution that PEPPOL provides to development of the information society and lifelong learning, strongly relies on its value for standardisation developments.

“Standards can be considered as the heritage of our civilisation, they represent current and past knowledge; they have to be progressive in order to properly evolve. The time required to develop standards should be reduced in order to always reflect the needs of the society.”

“Facilitate access to standards and improve communication of the value they can provide to the society should be critical tasks for the EU. Standards should be easy to comprehend, to apply, and not costly.”

“Some international standardisation bodies do not produce implementation guidelines for using the standards developed. EOSs should meet that need, producing clear and concise implementation guidelines in order to ensure ease of implementation.”

PEPPOL itself does not define the standards, leaving this to standardisation bodies, such as CEN/CENELEC and OASIS. PEPPOL represents the user group who has developed the implementation guidelines for standards-based electronic business documents - e-catalogue, e-orders, e-invoices - through the PEPPOL Business Interoperability Specifications (BIS), based on the CEN BII profiles, using them successfully; and has produced the PEPPOL BusDox specifications, describing how to implement the OASIS Business Document Exchange Standard to develop the open network infrastructure.

The PEPPOL open source solutions play a strategic role for the development of knowledge and innovation. PEPPOL strongly supports the opportunities of lifelong learning, both for the job market and in formal education. Two PEPPOL Consortium members are universities with important roles in the project. Students in these universities have been studying and following the PEPPOL developments. Master theses have also focused on PEPPOL.

Finally, the value of PEPPOL for the society is also recognised by the European Economic and Social Committee (EESC):

“The EESC strongly supports the European Commission’s actions relating to ICT standards and interoperability. In particular, this concerns the possibility of employing widely accepted ICT standards in public procurement in order to create demand for interoperable services led by the public sector, which will act as a key driver for standardisation.”

3.2 IMPACT ON KEY TARGETS

The PEPPOL main target groups are: contracting authorities (public sector buyers), economic operators (public sector suppliers), and ICT solution and service providers (as enablers for PEPPOL based solutions to end-users). The PEPPOL impact on its key target groups is summarised below.

**Impact on Contracting Authorities**

PEPPOL saves contracting authorities significant administrative and transaction costs through standardised, speedy and streamlined procedures.

**Impact expected:**

- By using standard-based components to improve supplier access to a wider e-procurement market across borders, PEPPOL provides opportunities for greater competition, lowering buyers’ sourcing costs.
- PEPPOL reduces the complexity of administrative procedures through standardised processes and business rules agreed at EU-level for the public sector.
- Using PEPPOL compliant solutions, contracting authorities can easily create e-procurement communities, even at a local level, providing the highest level of services, efficiencies and opportunities.
- Contracting authorities using national or regional e-procurement solutions can also connect to the PEPPOL network, converting to and from the PEPPOL specifications during the transport phase.
- Once connected to the PEPPOL network, contracting authorities can communicate electronically with any supplier in the network.

Increased adoption of PEPPOL components should foster competition for e-procurement solutions, resulting in lower costs to implement e-procurement for local governments and SMEs.

**Impact Realised:**

- Governments with existing e-procurement platforms are adding PEPPOL order and invoice capability covering more than one procurement process (Scotland)
- Governments not involved in the original PEPPOL project are connecting to the transport infrastructure, setting up Access points and national roll out plans for e-invoicing through PEPPOL (Ireland)
- Governments are simplifying supplier access, in particular for SMEs, by sustaining the developments of the Virtual Company Dossier (Italy, France)
- Regions are providing their communities with the opportunity to access the PEPPOL network for business expansion, becoming hubs for PEPPOL exchanges across countries (e.g. Emilia Romagna - Italy)
- Contracting authorities are rolling out PEPPOL implementations across their entire supplier base, leading as best practice (e.g: Lund University, Western Norway Regional Health Authority)

**User experience – Lund University**

Ulrika Steidler, e-procurement Manager at Lund University, discusses Lund University’s involvement in the PEPPOL Project:

"I attended the 4th PEPPOL Conference in 2010, and got involved as a pilot immediately after that as I saw the benefits for us. As an international university, a significant proportion of our more than 10,000 active suppliers in 2011 were international. We’ve worked with e-procurement since 2006 and are trying to increase the number of e-transactions as well as to decrease the time it takes for us to integrate our suppliers and reduce our administrative costs. Due to Sweden’s small size – compared to other European countries – it is not always easy to interest the suppliers in Swedish standard formats, unless they come as an internationally accepted format accompanied by a demonstration of efficiency and business gains. We intend to present PEPPOL to our suppliers as one of the standardised formats you can use for aligning their business processes electronically both pre-award and post-award."

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11 The case of Western Norway Regional Health Authority & Johnson&Johnson
Thanks to PEPPOL, Ms Steidler cites simplified processes and greater e-access to the university. Importantly, technical problems – i.e. compliance with a supplier’s internal business systems – have largely dissipated as the technology becomes more familiar to operators and more pervasive throughout the industry.

When asked how she sees the project evolving in the future, Ms Steidler is optimistic and eager to see the project grow:

“I think it is vital that the PEPPOL infrastructure is implemented in national solutions for e-procurement in Europe. We also need to get more pilots up and running, we need to make it easier for suppliers to see the benefits. My theory is: if I as a supplier make the effort to send PEPPOL e-invoices to Lund University, I would probably like to send e-invoices to others as well. But how do I find out if it is possible in an easy way? If I can easily reach other customers to set them up, my immediate benefits will increase.”

Importantly, Ms Steidler is helping expand the project by contacting colleagues at other Swedish universities to find out if they too are interested in the project, and sending them the information of their pilot suppliers. This word-of-mouth dissemination, complemented by a broader information campaign that increases efficiencies for all parties, will help develop the project into the future.

**Impact on Economic Operators**

PEPPOL provides economic operators, in particular SMEs, with new business opportunities and increased competitiveness, while lowering costs with automated tendering solutions. By breaking down the barriers to seamless electronic communications across borders and communities, PEPPOL can enable suppliers to realise significant benefits.

**Impact expected:**

- PEPPOL reduces significantly the cost and complexity of implementing e-procurement, using one single set of standard specifications accepted by any public sector authority across the EU, instead of adapting to a multitude of formats and non compatible standards.

- Once connected to the PEPPOL network, suppliers can communicate easily with everyone within PEPPOL, without being forced to join closed or non interoperable networks.

- PEPPOL allows for re-use of electronic data throughout the complete procurement cycle using the same standard, thus increasing the benefits of automation.

- Companies using national or regional e-procurement solutions can also connect to the PEPPOL network converting to and from the PEPPOL specifications during the transport phase.

Electronic procurement speeds up administrative activities and lowers costs of manual data entry. Immediate processing of invoices can also improve cash flow. PEPPOL makes it easier for suppliers to do business with public authorities, and with widespread adoption, the interconnection of businesses across the EU will produce greater opportunities and improved economies of scale.

**Impact Realised:**

- SME suppliers are able to take advantage of PEPPOL Access Point provider services such as simple e-invoice templates to send PEPPOL compliant invoices to governments across borders (e.g.: Celeris in the UK to Difi in Norway).

- Suppliers to governments are benefiting from the cost savings of using a single standard across orders, invoices, etc. (e.g.: Telecom Italia planning to implement other PEPPOL components with Consip).

- Organisations supplying products across borders to public and private sector clients have PEPPOL implementations in progress to reap the benefits of having the freedom to choose their Access Point provider, enter into only one agreement, and exchange documents with all of the other buyers in the PEPPOL network (e.g.: Perkin Elmer).

**User experience – Telecom Italia**

Telecom Italia, a service provider that has major contracts with Italian Public Administrations, has used the Consip e-procurement platform

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to receive purchase orders for several years. The amount of business Telecom Italia currently manages on the Consip e-procurement platform peaks at more than 200 orders per day.

In December 2011, Consip suggested that Telecom Italia join the pilot scheme for the exchange of electronic orders via the PEPPOL infrastructure, integrating software packages, processes and formats into the systems.

PEPPOL is Telecom Italia’s first real experience of interaction with customers through an e-procurement platform based on a European standard. The results of the implementation have highlighted the potential to achieve significant results in terms of cost savings from process automation: Orders can now be automatically processed through e-orders from the Consip platform to that of Telecom Italia with significant time and human resources savings.

Indeed, the greatest gains for Telecom Italia in using PEPPOL stem from the reduction of time spent processing orders, as well as improving the quality of service provided and facilitating interaction between public administrations and suppliers. The possibility of using a standards-based infrastructure, through an Access Point, for the exchange of information has greatly simplified the development of the prototype. The IT tools developed and made available by PEPPOL have also provided considerable advantages.

When asked how they see the project evolving in the future, a representative of the company suggested:

“To maximise results, Telecom Italia would like to see the e-procurement platforms of other public administrations in Italy adopt the PEPPOL specifications, and, finally, to complete our implementation with Consip and with other public administrations for the additional PEPPOL components, including tender participation, management and electronic invoicing.” - Massimiliano Materazzi, Key Account Manager - Top Clients and Public Sector, Telecom Italia.

Impact on the ICT industry

The ICT sector will play a key role in the implementation of PEPPOL’s infrastructure, assisting contracting authorities and suppliers to connect to the PEPPOL network and offering Pan-European e-procurement capabilities. PEPPOL boosts the development and the capabilities of the ICT industry with increased demand for new, user-friendly IT services.

Impact expected:

As more contracting authorities move to e-procurement, ICT companies will realise further efficiency gains and cost savings, as well as, a number of business opportunities:

• Widespread PEPPOL adoption by public sector buyers and their suppliers throughout Europe should create significant demand for more advanced IT solutions and services.

• First movers will gain valuable experience with the specifications and have an advantage in securing early implementation contracts.

• Small IT companies will have the opportunity to access new markets by offering PEPPOL enabled solutions accepted across Europe, overcoming barriers to business expansion.

• ICT companies can implement PEPPOL specifications to offer PEPPOL enabled services, or solutions in ERP software.

• Opportunity to expand usage of PEPPOL transport infrastructure (network) across any industry, within and outside Europe, becoming market leaders for global standards-based e-procurement solutions.

As ICT companies scale up their efforts to connect existing procurement communities electronically, the web of interconnected communities will grow, leading to a more efficient business climate throughout Europe.

Impact Realised:

- SMEs have been some of the first PEPPOL Access Point providers to become enabled and are starting to gain first move advantage.
- Many Access Point providers are offering value-added services to translate documents between the PEPPOL specifications and other standards.
- Countries not part of the original PEPPOL project consortium are planning PEPPOL implementations and seeking Authority status (Ireland with seven APs enabled).
- Countries outside of the EU are seeking PEPPOL Authority status (Russia).
- A relevant number of IT software vendors in Norway are starting to develop PEPPOL capability in their ERP systems.

User experience – Basware

In May 2012, Basware, a leading provider of e-invoicing and purchase-to-pay solutions, has successfully built PEPPOL compliant procedures and protocols into all of its e-invoicing solutions, expanding commerce opportunities for its customers across Europe. Staples Finland, a Basware customer, has become one of the first companies to start using PEPPOL-compliant e-invoices.

Following successful planning, collaboration and trialing of PEPPOL, the proposed specifications for e-invoices are being rolled-out to businesses. As of today Basware’s customers can send and receive PEPPOL-compliant e-invoices and documents to customers and suppliers. Basware customers are therefore able to meet the standardized business processes for the transmission of electronic invoices to organizations within Europe. Whilst Basware has always provided compliance with multiple invoice formats or standards, the premise of PEPPOL provides an agreed way to e-invoice, a major step forward in collaborative working.

Staples – a key supplier of office and industrial supplies to government agencies and a Basware customer – is one of the first companies to start using PEPPOL e-invoices. Pekka Leppälä, Sales Director, Staples explains: “As a supplier it is essential to be PEPPOL compliant to meet customer demands. When sales and invoicing processes are harmonized, it makes the relationship between buyer and supplier mutually beneficial and opens up new business opportunities, particularly against our competitors that may not yet be compliant.”

Basware’s implementation of PEPPOL comes three months before the Norwegian Government will mandate contracting authorities to require that all suppliers must invoice them electronically with the use of PEPPOL infrastructure as the preferred approach. The Agency for Public Management and eGovernment (Difi) state that this mandate by the Norwegian Government will make PEPPOL the ‘backbone of public electronic invoicing in Norway’. PEPPOL anticipate similar requirements from governments across Europe over the next few years.

Esa Tihilä, CEO, Basware says: “PEPPOL marks a step forward in open, collaborative commerce. Automating purchase processes along with a common way of working across Europe will significantly boost commerce opportunities between private and public businesses of every size. Basware believes in openness and collaboration between all parties across trading networks. The support we have provided to the PEPPOL initiative is based on recognition and understanding of the importance in providing an EU-wide standard for electronic document exchange upon which organizations can rely to automate their P2P processes.”

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3.3 PILOT COVERAGE

A summary of the quantitative and qualitative aspects of the pilot documentation, evaluation metrics and some important lessons learned from the piloting experiences and achievements regarding market adoption (pilot coverage) of PEPPOL at project end (August 2012), is provided as follows:

1. In the Transport Infrastructure, the project objectives have been largely achieved. In fact, overall piloting achievement in Access Points have surpassed the ambitions of Consortium members, as a much larger pipeline was developed due to spontaneous market adoption. A strong finish in the last six months of the project seems to reflect accelerating market penetration, partly driven by demonstrable results as well as the prospect for Service Providers to join OpenPEPPOL.

   • Access Point providers: 51 enabled; 11 under development

2. From the post-award document specifications, e-invoicing seems to be the “killer app” as it follows market penetration of the Transport infrastructure. Real transactions scaled up in the last months of the project and reached just under 9,000 and a steady flow appears to establish a market presence. For Billing and Procurement Business Interoperability Specifications (BIS) there are relatively few pilots, none of which became fully enabled, which shows there is more difficulty and some reluctance to go deep into the procurement workflow and standardise a wider set of procedures. This would require a greater market maturity to happen.

   • e-invoicing platforms (implementing BIS 4a): 29 enabled; 50 under development
   • e-billing platforms (implementing BIS 5a): 7 under development
   • e-procurement platforms (implementing BIS 6a): 8 under development

3. e-ordering and post-award e-catalogue have considerably fewer pilots, and have not reached a maturity level yet as we see in e-invoicing, resulting in fewer transactions.

   • e-ordering platforms (implementing BIS 3a): 5 enabled; 10 under development
   • Post-award e-catalogue (implementing BIS 1a): 5 enabled; 13 under development

4. In post-award usage, the level of ambition for reaching large numbers of Contracting Authorities (CAs) and Economic Operators (EOs) is nearly achieved, as the e-procurement communities enabled, particularly in Denmark, Norway and Sweden, offer such potential. Already with Nemhandel in Denmark we have concrete evidence of a very large e-procurement community being fully enabled but work still remains to be done in order to replicate this success. In terms of CAs and EOs actually enabled in these e-procurement Communities, it is difficult to have exact numbers as this is often commercially sensitive information held only with their Service Providers.
• e-procurement communities, defined as a group of organisations (buyers, suppliers) which use the same IT solution with a common set of electronic procedures for all aspects of the procurement process: 60 enabled; 19 under development

5. In pre-award, wide market adoption and spontaneous reaction has not been fully realised. This market will still need to be convinced through more extensive piloting and building on the experiences of PEPPOL. It is a less mature market for PEPPOL specifications and components, but one where significant new ground has been broken through in the PEPPOL pilots. It has been encouraging to see some PEPPOL-compliant tenders appearing towards the end of the project, which means improvement is necessary in the near future.

• Pre-award e-catalogue (implementing BIS 12a): 3 enabled; 1 under development

6. In the Virtual Company Dossier (VCD) there were mostly post-award transactions, as not many tenders offered the possibility to use the solution, so post-award cases and “handheld” transactions with organizations around the implementation teams of the Consortium were the main actors with active involvement.

• Pilots implementing the VCD: 3 enabled; 4 under development

7. Currently, the PEPPOL e-signature validation infrastructure covers 100% of the qualified certification authorities of Europe.

• Pilots implementing e-signature Validation: 6 enabled, 5 under development

8. As an overall concluding remark, PEPPOL did achieve real production pilot status in some of its scenarios. This is true even when applying high standards and strict criteria about what is a production pilot – for the PEPPOL Pilot Lifecycle Management Methodology (PPLM) being in actual production implies seamless real transactions as part of the organisations’ everyday practice. Of course not every PEPPOL pilot achieved that level, but some did. And this is indeed a great achievement that promises more successes in the future.
Section 4
How to Join the community
4.1 OPENPEPPOL

As the PEPPOL project has reached a successful completion, with the PEPPOL specifications being implemented across Europe, OpenPEPPOL has been established as a non-profit international association comprised of public and private members of the PEPPOL community, with operations beginning on September 1st, 2012.

OpenPEPPOL strives to set widely accepted standards based business processes, ensuring long-term sustainability, maintaining, promoting and supporting the wider use of the PEPPOL specifications, building blocks and services. The Association provides the authoritative point of reference for networks of interoperable, PEPPOL-compliant infrastructure and the organisations that use it, ensuring high level governance and continuation of the agreement infrastructure.

The main goals of OpenPEPPOL are as follows:

1. Encourage European governments and their suppliers to continue implementing e-procurement using the PEPPOL specifications and promoting best practices.

2. Encourage the development of innovative PEPPOL-based ICT products and services, promoting their use also in the Business to Business context to harmonise processes across the private and public sectors, simplifying e-procurement adoption for small and medium sized enterprises.

3. Ensure that the PEPPOL network continues to grow in an open, accessible and compliant manner, supporting interoperability for European public services and helping Europe move towards a Digital Single Market.

With the future of the PEPPOL specifications assured and with the support of the European Commission, ICT vendors of all sizes are investing resources to support PEPPOL in their solutions. As more products are developed, businesses and contracting authorities will have a choice of simple and more flexible ways to implement PEPPOL’s e-procurement solutions, which will lead to increased market driven adoption.

OpenPEPPOL Membership

By becoming a member of OpenPEPPOL, private and public organisations will have the unique opportunity to join forces and drive adoption of standards, process automation and connectivity across Europe. In particular, OpenPEPPOL members enjoy the following benefits:

- Influence the development of e-procurement standardisation and adoption of standards in Europe.

- Gain knowledge of where the e-procurement market is heading, trends, usage, legislation, etc., supporting decision makers in implementing interoperable and compliant e-procurement solutions.

- Influence the possible expansion of PEPPOL specifications to other functions in the e-procurement process - for example, logistics, payments and remittance advices.

- Ensure relevance and usability of PEPPOL for specific industries or sectors through an ongoing review of business requirements.

- Access to a wide network of private and public sector members with expertise in multiple countries and industries.

How to join the community

Organisations will have the unique opportunity to join forces and drive adoption of standards, process automation and connectivity across Europe.

...
Membership of OpenPEPPOL is open to the following types of organisations:

- Contracting authorities (public sector buyers), economic operators (suppliers) and other end-users of PEPPOL specifications, building blocks and services
- Regional or other types of Authorities within the PEPPOL network
- Service Metadata Publisher Providers
- Access Point Providers
- e-signature Validation Service Providers
- Pre-award Service Providers
- Other organizations which are relevant to the purposes of OpenPEPPOL

For more information about how to join OpenPEPPOL and download the registration form, go to:

http://www.peppol.eu/about_peppol/openpeppol/how-to-join
Section 5
Consortium and contact details
**5.1 DEVELOPMENT OF BENEFICIARIES**

During the project period, new beneficiaries were recruited while others left the project. An accumulated total of 21 members took part. The figure below shows the changes in beneficiary participation, starting with 14 pioneers and ending in the last year with 17 active beneficiaries.

The 17 partners (mostly leading public e-procurement agencies) within 11 countries: Austria, Denmark, Finland, France, Germany, Greece, Italy, Norway, Portugal, Sweden and the United Kingdom. PEPPOL activities have been funded jointly by consortium members and the European Commission with the mission to preparing the technical infrastructure to enable a cross-border e-procurement market by 2012. As such, PEPPOL is part of the European Commission’s Competitiveness and Innovation Framework Programme’s ICT Policy Support Programme.
To fully implement PEPPOL, the project partners are developing agreements and specifications for the exchange of business information between contracting authorities and their suppliers. The project partners are also investing into aligning national systems, standards and legislations with the common European specifications. By linking existing national systems of electronic public procurement all participants will enjoy the full benefits of the single European market. (For more information, please go to: http://www.peppol.eu/about_peppol/project_partners)

5.2 Contact points: Head of Beneficiary (HoB)

In the table below the relevant contact persons from each beneficiary are listed. They have all been members of the Head of Beneficiary Forum (HoBF) through the project period. The first person mentioned from each country is the latest functioning HoB.

<table>
<thead>
<tr>
<th>Country</th>
<th>Beneficiary</th>
<th>Representative</th>
<th>Email address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>PEPPOL.AT</td>
<td>Silke Weiss Josef Makolm</td>
<td><a href="mailto:silke.weiss@bmf.gv.at">silke.weiss@bmf.gv.at</a></td>
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<td>VM</td>
<td>Juhani Koivunen</td>
<td><a href="mailto:juhani.koivunen@netum.fi">juhani.koivunen@netum.fi</a></td>
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<tr>
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For further information, please visit our website: http://www.peppol.eu/

Project Duration: 52 months
The PEPPOL project started 1st of May 2008 and ran until 31st of August 2012.
Annex
The PEPPOL EIA Repository and Toolbox
The PEPPOL Enterprise Interoperability Architecture (EIA) is a structured approach to present the PEPPOL artifacts (project documents, specifications, user guides, software tools, etc.) in a repository so that different stakeholders can access information relative to their specific needs, in a consistent and flexible way. The EIA repository illustrated below as three dimensional matrix is a useful tool for organisations interested in implementing the PEPPOL components, and become familiar with the results of the project.

At the top, the cube comprises 4 interoperability communities, reflecting the PEPPOL components:

- e-signature Validation Infrastructure – validates e-signature certificates across EU borders.
- Transport Infrastructure – enables pan-European eDelivery of business documents between the e-procurement communities.
• Post-Award e-procurement - enables the purchasing process consisting of e-catalogue, e-ordering and e-invoicing

• Pre-Award e-procurement – enables the tendering process currently consisting of eAttestation (VCD) and e-catalogue

The above 4 communities are also linked to 6 dimensions:

• ICT Architecture – providing the ICT scope, solutions and ICT architecture for the interoperability community

• Conformance and Test – comprising the requirements, processes and tools of conformance for the different interoperability stakeholders

• Life Cycle Management (LCM) – processes for LCM of business and ICT architectures

• Governance - comprising the governance structure, legal framework and processes for the business and ICT architectures

• Marketing – including processes and material for increasing awareness and recruiting new participants for PEPPOL pilot projects

• Business – being the business scope and business architecture of the interoperability community

Furthermore, each community dimension is divided into 5 abstraction levels:

• Strategy

• Framework

• Models (guidelines and specifications of the different services and components)

• Services and Components

• Designs

• Implementations

These 5 abstraction levels can be viewed as follows:

Strategy, Framework, Models, Services and Components are generic artifacts where the Models can be instantiated into specific designs and implementations. The Services and Components can be used in the specific designs and incorporated into the implementations.

The EIA repository can be found at: http://www.peppol.eu/peppol_components/peppol-eia/eia