POLITECNICO DI MILANO

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Master of science in Management engineering

Electronic Invoicing diffusion and countries' behavior

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INTRODUCTION

Nowadays electronic invoicing is a relevant topic and a great source of benefits in the European context but, there isn't a clear and univocal overview about the diffusion rate and realistic statistics about this practice. This situation creates uncertainty by the stakeholders inside the country.

This thesis pretends to give a clear view of the European situation about eInvoicing, taking into consideration the adoption level and practices used. The general schema of the international dimension of this topic is discussed, going into the details of some countries where have been noticed peculiarities.

The main effort is dedicated to Italy, Germany and United Kingdom that are compared from different viewpoints regarding the normative, the most used communication methods and the diffusion.

METHODOLOGY

The methodology followed to perform this research is divided basically in two phases: the data collection and the empirical analysis. These two steps allow, in the end, to identify the summary notes, facts, measures that create awareness about the actual situation in Europe of the eInvoicing. The phase of data collection is characterized by

the analysis of the secondary sources and the research of experts' name, for the direct interviews. This part has the aim to obtain new perspectives of the information already taken into consideration in the empirical analysis, interviewing the stakeholders of eInvoicing and clear the contradictory aspects found in the research.
For these purposes a questionnaire was designed in order to confirm the data obtained and collect perceptions about the electronic invoicing status in Europe. At the end of the data collection phase, the countries with more significant data and which represent the real status of Europe have been selected and analyzed in depth.

OBJECTIVES

The adoption of dematerialization services in the everyday business is continuously growing. In particular, business operators, looking for more efficient collaborations within the supply chain and public administration relationship, are pushing towards the adoption of digital-based solutions for a more transparent economy. The purpose of the thesis is to define the current adoption of electronic invoicing in the World with more attention at the European situation and in particular to the one of Italy, United Kingdom and Germany, trying to understand which are the most used mechanisms of data transmission (e.g. EDI, PDF) and data security (e.g. digital signature, time stamping). Moreover, will be studied:

- the normative of the countries in terms of strictness and criticalities establishing a framework of measurement and a classification of the different European Countries according to their behavioral pattern or environmental

condition.

- Obstacles, enablers, negative and positive conditions that affect directly the adoption and correct development of electronic invoicing among the industries, especially in Italy, United Kingdom and Germany.

- Diffusion level of eInvoicing and of the most used communication methods.

LITERATURE REVIEW

The literature review analyzes the aspects that characterize the electronic invoices as a process, and take into consideration the aspects of the European and World situation. The first part is dedicated to the "dictionary" with the *definition and meaning of electronic invoicing* and taking into consideration the difference between *active and passive invoices.* Moreover this part treats the transmission and storing methods of the data giving a definition of *Electronic Data Interchange (EDI),* the different types of *electronic and digital signature (basic, advanced and qualified)* and of *substitute archiving.* The following paragraph is dedicated more specifically to the technologies used for data transmission. The existing solutions are: *Traditional EDI*, *Internet EDI, Web EDI, XML EDI, Extranet Web based, XML-based solutions.* Basically the choice depends on the size of the company, capitals availability and frequency of communication.

Going more into the details of eInvoicing, it has been analyzed the 2020 Europe strategy that is a ten years based process which aims to address the shortcomings of the growth model and create the conditions for a different type of growth that is smarter, more sustainable and more inclusive. It is based on three basic principles:

- Smart growth: developing an economy based on knowledge and innovation.
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
- Inclusive growth: fostering a high-employment economy delivering economic, social and territorial cohesion.

The following part talks also about the opposite side of the coin: concerns and obstacles of electronic invoicing.

Six main parameters are identified that seriously undermine efforts to exploit ICT, making clear the need for a comprehensive and united policy response at the European level: *lack of interoperability*, *rising cybercrime and risk of low trust in networks*, *lack of investment in networks*, *insufficient research and innovation efforts*, *lack of digital literacy and skills, missed opportunities in addressing societal challenges.*

A fundamental part is played by the stakeholders of the process represented by the *government, technology and service providers (Software, Banking Service providers, Document Management, B2b Service providers) and by the banks.*

- Government. Since it is the enabler of eInvoicing the governmental sector has many key roles in the process. In fact issues the laws and accomplishes the control activities, supplies the enabling tools and the technology for the digital

signature which guarantee the authenticity and the origin of the documents and promotes the use of eInvoicing.

- Technology and service providers.The actors that are in charge to create the awareness of the benefits of eInvoicing and also to provide solutions with the right integration tools belongs to this category.

- Banks. This sector is fundamental for the payment cycle process, indeed the invoice is obviously paid in the bank. Moreover this actor interacts and act as consultant among the parties involved in the process and is looking for a deeper internal (inter-bank networks)and also external (between banks and companies) integration.

The definition of the actors brings with it the definition of the environment where they have to operate. It has been made a distinction among macro-areas identified by the continents: Europe, Asia (here are also present Australia and New Zealand), Africa, North America, Latin America. The main effort was dedicated to the Europe situation (the situation of the other areas were not belittled but was given an overview of the most important and peculiar aspects) where has been studied four aspects: *the current adoption of eInvoicing in Europe, the regulatory framework, the potential benefits stemming from the adoption of eInvoicing, the main European initiatives to promote the adoption of eInvoicing.*

Below is explained the meaning and the basis on which it was set the analysis:

- *The current adoption of eInvoicing in Europe:* is the percentage of companies and public administration entities that are using the eInvoicing in their productive processes. Not necessarily all the invoices have to be sent electronically, but the eInvoicing must be implemented and used.
- *The regulatory framework:* is the set of laws and requirements established by the government agencies for the adoption of eInvoicing. In this paragraph are also considered the updated data coming from the European commission on electronic invoicing that establishes recommendations to each member state, discussed in advanced with the country involved.
- *The potential benefits stemming from the adoption of eInvoicing:* here are considered all the features and strong points of electronic invoicing both for a better management (effectiveness) and for the cost saving (efficiency)
- *The main European initiatives to promote the adoption of eInvoicing: the objective of this part is to clarify the goals of the European commission and the* set of tangible actions to make the uptake of eInvoices in Europe easier. They can be summarized in these points:

    1. Ensuring a consistent legal environment for eInvoicing
    2. Achieving mass market adoption by getting SMEs onboard
    3. Stimulating an environment that creates maximum reach between trading partners exchanging invoices
    4. Promoting a common eInvoicing standard

The last paragraph is dedicated on how the electronic invoicing is one of the means through which is possible to reach the strategic objectives needed for an integrated supply chain collaboration, the goal of one of the practice to face it: *Supply Chain Management*.

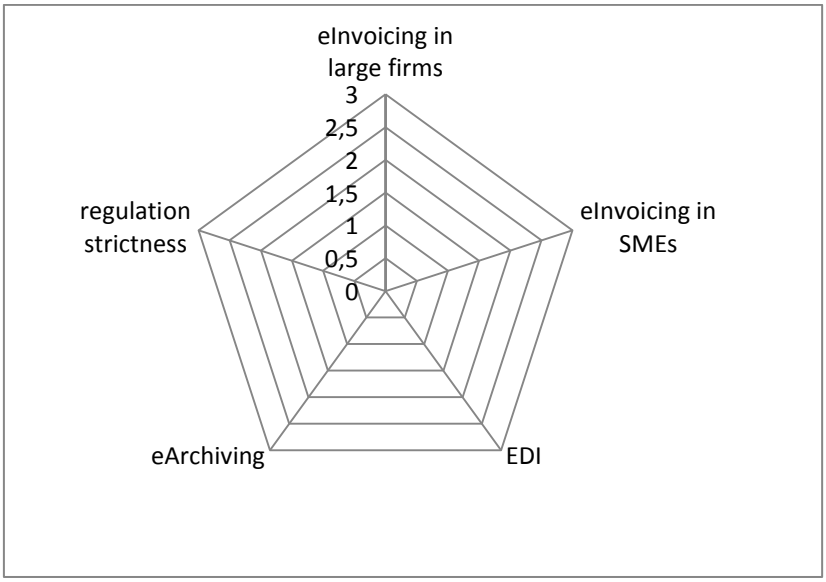
EMPIRICAL ANALYSIS

In the empirical analysis are studied in detail the most important countries of the European Union , in particular Italy, United Kingdom, Sweden, Ireland, Denmark, Poland, Finland and Germany. Moreover are studied Argentina and China in order to complete the analysis of the extra-EU countries. For each European country are analyzed*: the regulatory framework, the basic information required, a focus on a particular aspect of the country*, the *comparative chart and the spider diagram* .

- *The regulatory framework:* explains the laws and regulation of the specific country
- *The basic information required:* establishes which are the minimum characteristics that a document must have to be considered first a legal invoice and secondly an electronic invoice. Here are also present some particular country's recommendation.
- *A focus on a particular aspect of the country:* this section analyzes typical example of the state.
- *Comparative chart* : comparison between Italy and the country in exam of the most important characteristics of (table 1).
- *Spider diagram:* visualizes the results obtained (table 2).

	ITALY	Country in exam
COUNTRY PARTICULAR STANDARDS		
ALLOWED COMMUNICATION METHODS		
COUNCILE DIRECTIVE 2010/45/eu ADOPTED		
MANDATORY eInvoicing TOWARDS PA		
MAIN eArchiving REQUIREMENTS		
PERCENTAGE OF DIFFUSION		

TABLE 1- GENERAL COMPARATIVE CHART



- If the value is zero means that the practice has low penetration and/or that the regulatory framework does not facilitate the adoption.
- A well-structured law and a wide diffusion make the value equal to 3

TABLE 2 - GENERAL SPIDER DIAGRAM

SUMMARY NOTES

The last part of the thesis is dedicated to the countries comparison in order to get a clear and definitive overview about the electronic invoicing adoption, and to a zoom on Italy, Germany and UK, for summarizing their similarities and differences.

In the first part, the nations are clustered according to similar characteristics visualized in the spider diagrams. Hereafter are explained in details the parameters taken into consideration.

eInvoicing in large firms	➢ Diffusion level of eInvoicing in large firms
eInvoicing in SMEs	➢ Diffusion level of eInvoicing in SMEs
EDI	➢ Diffusion level of EDI with respect to other methods
eArchiving	➢ Usage and development of the practice ➢ Easiness to adopt and use it from a legal perspective
Regulatory strictness	➢ Specific requirements for eInvoice implementation and management increase the value ➢ Government behavior: if it is promoting the development of the practice the value is lower

According to these characteristics the resulting diagrams are reported below

- *HIGH eInvoicing DIFFUSION WITH LOW REGULATION STRICTNESS*

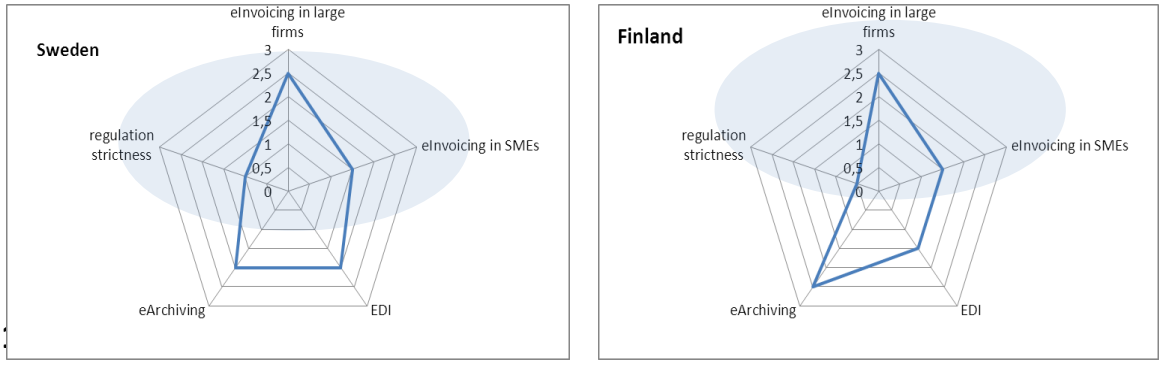


TABLE 3 – HIGH EINVOICING DIFFUSION WITH LOW REGULATION STRICTNESS

- *HIGH eInvoicing DIFFUSION WITH HIGH REGULATION STRICTNESS*

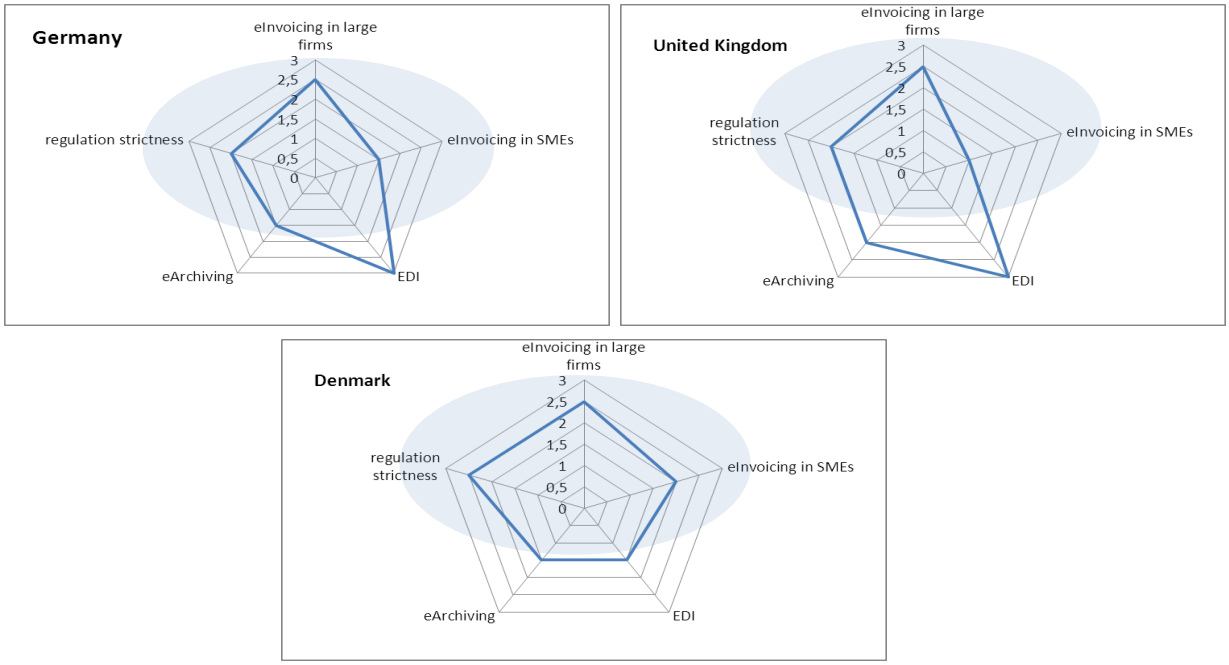


TABLE 4 - HIGH EINVOICING DIFFUSION WITH HIGH REGULATION STRICTNESS

- *MEDIUM/LOW eInvoicing DIFFUSION WITH HIGH REGULATION STRICTNESS*

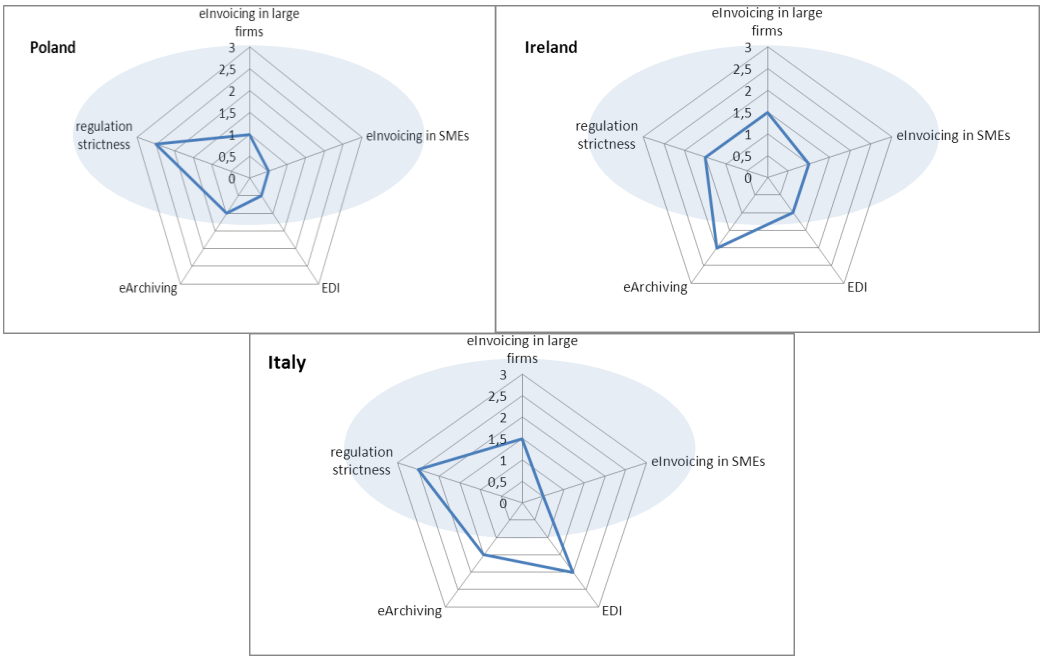


TABLE 5 - MEDIUM/LOW EINVOICING DIFFUSION WITH HIGH REGULATION STRICTNESS

Talking about the zoom on Italy, Germany and United Kingdom the analysis is focused on three main aspects which are the eInvoicing, the EDI and the eArchiving. From the research the most important results obtained are represented in figure 1:

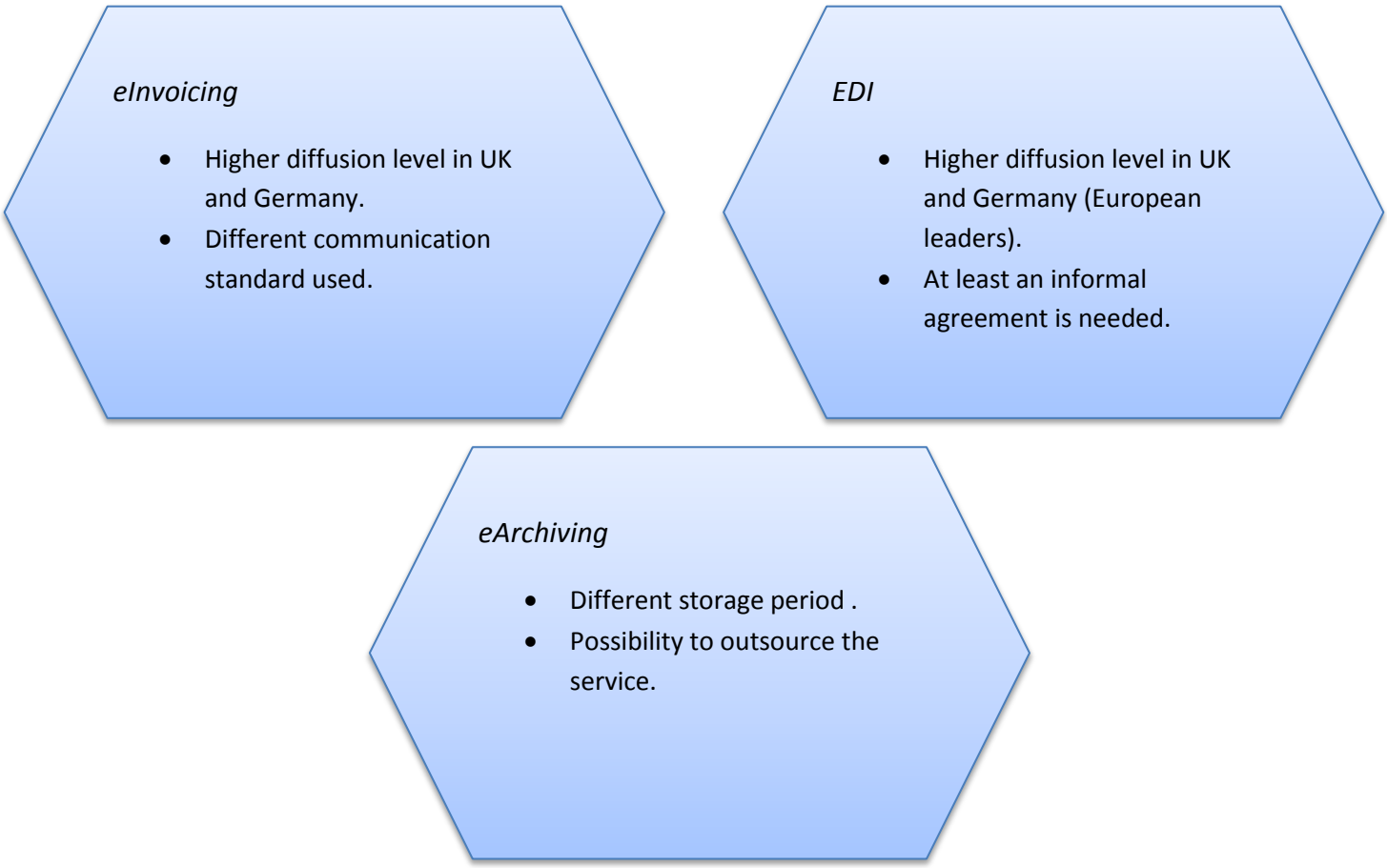


FIGURE 1 - COUNTRIES COMPARISON

SINTESI

INTRODUZIONE

Oggigiorno la fatturazione elettronica è un argomento rilevante e una grande fonte di benefici nel contesto Europeo ma non c'è una chiara e univoca visione sul grado di diffusione e statistiche realistiche a riguardo. Questa situazione crea insicurezza nei soggetti implicati in tale pratica.

La tesi si pone di dare una chiara visione della situazione Europea riguardo alla fatturazione elettronica, prendendo in considerazione il livello di recepimento e le tipologie di comunicazione utilizzate. Viene discusso l'argomento anche in tema internazionale a livello generale, andando poi nel dettaglio di quelle nazioni nelle quali sono state riscontrate particolarità.

Lo sforzo maggiore è stato dedicato a Italia, Germania e Regno Unito che sono stati confrontati da diversi punti di vista come il quadro normativo, i metodi di comunicazione più utilizzati e la diffusione della fatturazione elettronica.

METODOLOGIA

La metodologia seguita per svolgere la ricerca è divisa in due fasi: la raccolta dati e l'analisi empirica. Questi due passaggi permettono di identificare le note di sintesi i fatti e i risultati che rendono possibile la comprensione della situazione Europea attuale riguardo la fatturazione elettronica.

La fase di raccolta dati è caratterizzata dall' analisi delle fonti secondarie e dalla ricerca di esperti del settore per svolgere le interviste dirette. Questa parte ha l'obiettivo di

ottenere nuove prospettive delle informazioni già prese in considerazione nell' analisi empirica, intervistando gli stakeholders della fatturazione elettronica e chiarendo gli aspetti contraddittori trovati nella ricerca.

Per questi obiettivi è stato strutturato un questionario per confermare i dati ottenuti e raccogliere pareri riguardo allo stato della fatturazione elettronica in Europa. A conclusione di questa fase le nazioni con dati più significativi e che rappresentavano al meglio la situazione Europea sono state selezionate e analizzate nel dettaglio.

OBIETTIVI

L'adozione dei servizi di dematerializzazione nella vita lavorativa quotidiana sta continuamente crescendo. In particolare, gli operatori di business, cercando una collaborazione più efficiente nella supply chain e nella relazione con la pubblica amministrazione, stanno spingendo per l' impiego di soluzioni digitali per una gestione più trasparente. Il fine della tesi è quello di definire il livello di adozione corrente della fatturazione elettronica nel mondo con maggiore focalizzazione sull' Europa e in particolare per Italia, Regno Unito e Germania, cercando di capire quali sono i meccanismi di trasmissione dati (es. PDF, EDI) e i meccanismi di sicurezza più utilizzati (es. firma digitale, marcatura temporale). In più verranno approfondite:

- la normativa delle nazioni in termini di rigore e criticità, stabilendo un quadro di riferimento e una classificazione delle nazioni Europee analizzate a seconda del loro atteggiamento e delle condizioni di sviluppo.

- Gli ostacoli, I fattori abilitanti, le condizioni positive e negative che condizionano direttamente l'adozione e il corretto sviluppo della fatturazione elettronica tra i diversi settori, soprattutto in Italia, Gran Bretagna e Germania.

- La diffusione della fatturazione elettronica e i metodi di comunicazione.

REVISIONE DELLA LETTERATURA

La revisione della letteratura analizza gli aspetti che caratterizzano il processo di fatturazione elettronica prendendo in considerazione la situazione Europea e mondiale. La prima parte è dedicata al "dizionario" con la *definizione e significato di fattura elettronica* prendendo in considerazione la differenza tra *fatture attive e passive.* In più questa parte tratta i metodi di trasmissione e archiviazione dei dati dando la definizione di *Electronic Data Interchange (EDI),* dei diversi tipi di *firma digitale (base, avanzata e qualificata)* e di *archiviazione sostitutiva.* Il paragrafo successivo è dedicato più specificatamente alle tecnologie usate per la trasmissione dei dati. Le soluzioni esistenti sono: *EDI tradizionale, EDI via internet, Web EDI, XML EDI, Extranet e XML.*
Fondamentalmente la scelta dipende dalla grandezza dell'azienda, dal capitale disponibile e dalla frequenza delle comunicazioni.

Andando più nel dettaglio della fattura elettronica, è stata analizzata la strategia Europa 2020 che riguarda un processo decennale atto a promuovere un modello di

crescita e creare le condizioni adatte per uno sviluppo brillante, sostenibile e completo, che costituiscono i principi identificativi dell' iniziativa.

- Crescita brillante: promuovere un'economia basata sulla conoscenza e l'innovazione.
- Crescita sostenibile: promuovere un economia più efficiente, eco-sostenibile e competitiva.
- Crescita completa: perseguire un economia ad alto tasso di impiego grazie a una coesione economica, sociale e territoriale.

La parte successiva tratta argomenti opposti, ovvero preoccupazioni e ostacoli dell'adozione della fattura elettronica. Sono stati identificati sei principali parametri che condizionano il pieno sfruttamento della tecnologia, evidenziando il bisogno di una risposta globale e unificata a livello Europeo: *mancanza di interoperabilità, crescita della pirateria informatica e del rischio legato a canali di comunicazione non sicuri, mancanza di investimenti nei canali di comunicazione, insufficiente impegno in ricerca e innovazione, mancanza di conoscenze base e capacità informatiche, mancate opportunità di direzionare i cambiamenti della società.*

Una parte fondamentale è ricoperta dagli stakeholders del processo, rappresentati dal *governo, dai fornitori della tecnologia e servizi (software, servizi bancari, gestione documentale) e le banche*

- *Governo*. È l'abilitatore della fatturazione elettronica e ha molti ruoli chiave nel processo. Infatti emana le leggi e svolge le attività di controllo, fornisce gli strumenti e la tecnologia per il processo come per la firma digitale che

garantisce l'autenticità e l'origine dei documenti. In più è influente nella promozione della fatturazione elettronica.

- *Tecnologia e fornitori di servizi.* Rappresentano i soggetti incaricati di creare consapevolezza dei benefici e di fornire soluzioni con gli strumenti di integrazione più adatti.
- *Banche.* Questo è un settore fondamentale per il processo di pagamento, infatti la fattura viene pagata in banca. In più interagisce e opera come consulente tra le parti interessate nel processo e cerca un' integrazione interna (inter-bank networks) e esterna (tra banche e aziende).

La definizione degli attori porta come naturale conseguenza la definizione dell'ambiente nel quale devono operare. È stata fatta una distinzione in macro aree identificate dai continenti: Europa, Asia (qui sono presenti anche Australia e Nuova Zelanda), Africa, Nord America, e Sud America. La parte predominante è dedicata all'Europa (senza trascurare le altre) dove si sono studiati quattro aspetti principali: *l'adozione corrente della fattura elettronica in Europa, il quadro normativo, i benefici potenziali derivanti dall'adozione della fattura elettronica, le principali iniziative per promuovere l'adozione della fattura elettronica.*

- *Adozione corrente della fattura elettronica in Europa:* è la percentuale di compagnie e di Pubblica Amministrazione che usano la fatturazione elettronica nei loro processi produttivi. Non necessariamente tutte le fatture devono essere spedite elettronicamente, ma il sistema deve essere implementato e utilizzato.

- *Quadro normativo:* è il set di leggi e requisiti stabiliti dal governo per l' adozione della fattura elettronica. Sono considerati i dati aggiornati derivanti dalle iniziative della Commissione Europea sulla fattura elettronica che stabilisce parametri per ogni stato membro, discusso a priori con la nazione in questione.
- *Benefici potenziali derivanti dall'adozione della fattura elettronica:* qui sono considerati tutte le caratteristiche e i punti chiave della fatturazione elettronica sia per una gestione ottimizzata (efficienza) sia per un taglio dei costi (efficacia).
- *Principali iniziative per promuovere l'adozione della fattura elettronica:* l'obiettivo di questa parte è quello di chiarire gli obiettivi della Commissione Europea e il set di azioni tangibili per rendere più semplice l'adozione della fatturazione elettronica in Europa. Possono essere riassunte nei seguenti punti:
    1. assicurare leggi consistenti per la fatturazione elettronica.
    2. Raggiungere un mercato di massa grazie alla diffusione anche nelle piccole e medie imprese.
    3. Creare un ambiente che crei un facile collegamento tra i partner implicati nel processo di scambio delle fatture elettroniche.
    4. Promuovere uno standard comune.

L'ultimo paragrafo è dedicato a come la fatturazione elettronica sia uno dei mezzi attraverso i quali è possibile raggiungere obiettivi strategici necessari per ottenere una

supply chain integrata che è lo scopo di una delle pratiche atte a ottimizzarla: *Supply Chain Management*.

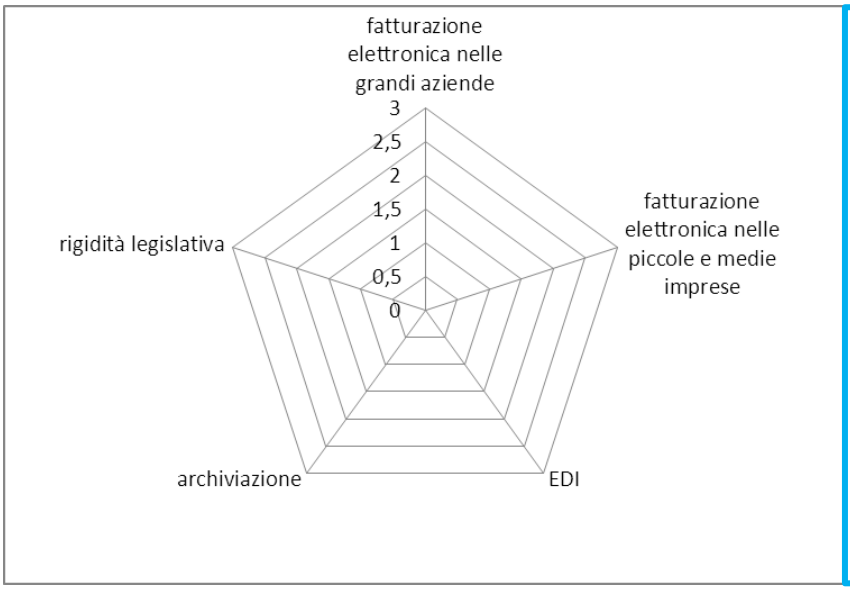
ANALISI EMPIRICA

Nell'analisi empirica sono studiate in dettaglio le più importanti nazioni Europee, in particolare Italia, Regno Unito, Svezia, Irlanda, Danimarca, Polonia, Finlandia e Germania. In aggiunta sono state approfondite Argentina e Cina per completare l'analisi delle nazioni extra-EU. Per ogni stato Europeo sono stati analizzati: *il quadro normativo, le minime informazioni richieste, un focus su un aspetto particolare della nazione, una tabella comparativa e un diagramma a ragno*.

- *Quadro normativo:* comprende le leggi della nazione in esame
- *Minime informazioni richieste:* stabilisce quali sono le caratteristiche minime che un documento deve avere per essere considerato legalmente prima come una fattura e poi una fattura elettronica
- *Focus su un aspetto particolare della nazione:* questa parte analizza un esempio, tipico dello stato in esame.
- *Tabella comparativa:* relaziona l'Italia con lo stato analizzato riguardo agli aspetti più importanti (tabella 1a)
- *Diagramma a ragno:* visualizza i dati ottenuti (tabella 2a)

	ITALIA	PAESE IN ESAME
STANDARD TIPICI DEL PAESE		
METODI DI COMUNICAZIONE PERMESSI		
ADOZIONE DIRETIVA 2010/45/UE		
OBBLIGO DI FATTURAZIONE ELETTRONICA VERSO LA PUBBLICA AMMINISTRAZIONE		
PRINCIPALI REQUISITI DI ARCHIVIAZIONE		
PERCENTUALE DI DIFFUSIONE		

TABELLA 1A- TABELLA COMPARATIVA GENERALE



- Se il valore è zero significa che la pratica ha una passa penetrazione e/o il quadro normativo non facilita l'adozione.
- Una legge ben strutturata e una diffusione ampia rende il valore pari a 3.

TABELLA 2A – DIAGRAMMA A RAGNO GENERALE

NOTE DI SINTESI

L'ultima parte della tesi è dedicata al confronto tra le nazioni per dare una visione chiara e definitiva riguardo l'adozione della fatturazione elettronica e uno zoom su Italia, Germania e Regno Unito per riassumere le uguaglianze e differenze.

Nella prima parte le nazioni sono state raggruppate a seconda di caratteristiche simili visualizzate nei diagrammi a ragno. In seguito sono spiegati in dettaglio i parametri presi in considerazione.

Fatturazione elettronica nelle grandi aziende	➢ Livello di diffusione nelle grandi aziende
Fatturazione elettronica nelle piccole e medie imprese	➢ Livello di diffusione nelle piccole e medie imprese
EDI	➢ Livello di diffusione dell' EDI rispetto agli altri metodi
Archiviazione	➢ Uso e sviluppo della pratica ➢ Facilità di utilizzo e adozione della pratica
Rigidità legislativa	➢ Requisiti per l'implementazione e gestione della fatturazione elettronica aumentano il valore ➢ Comportamento del governo: se promuove l'adozione della pratica il valore diminuisce

In accordo con queste caratteristiche sono stati individuati diversi gruppi.

- ALTA DIFFUSIONE DELLA FATTURA ELETTRONICA CON BASSA RIGIDITA' LEGISLATIVA

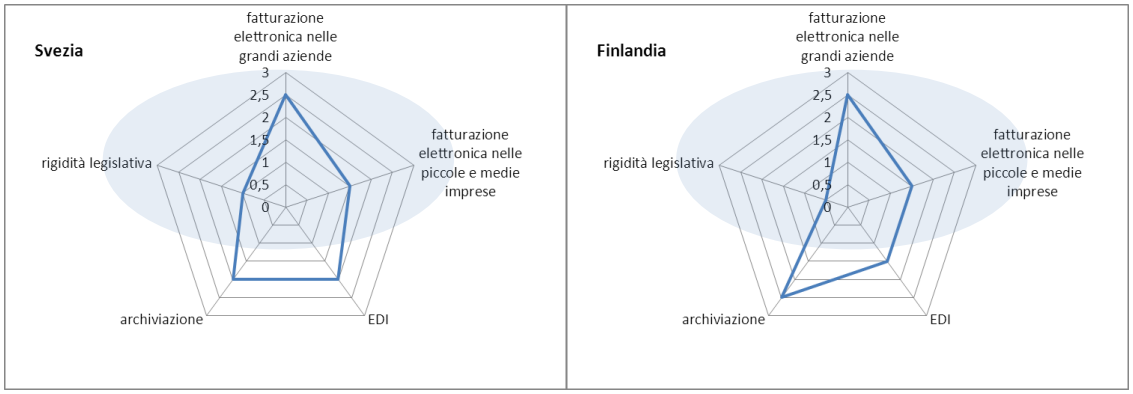


TABELLA 3A - ALTA DIFFUSIONE DELLA FATTURA ELETTRONICA CON BASSA RIGIDITA' LEGISLATIVA

- ALTA DIFFUSIONE DELLA FATTURA ELETTRONICA CON ALTA RIGIDITA' LEGISLATIVA

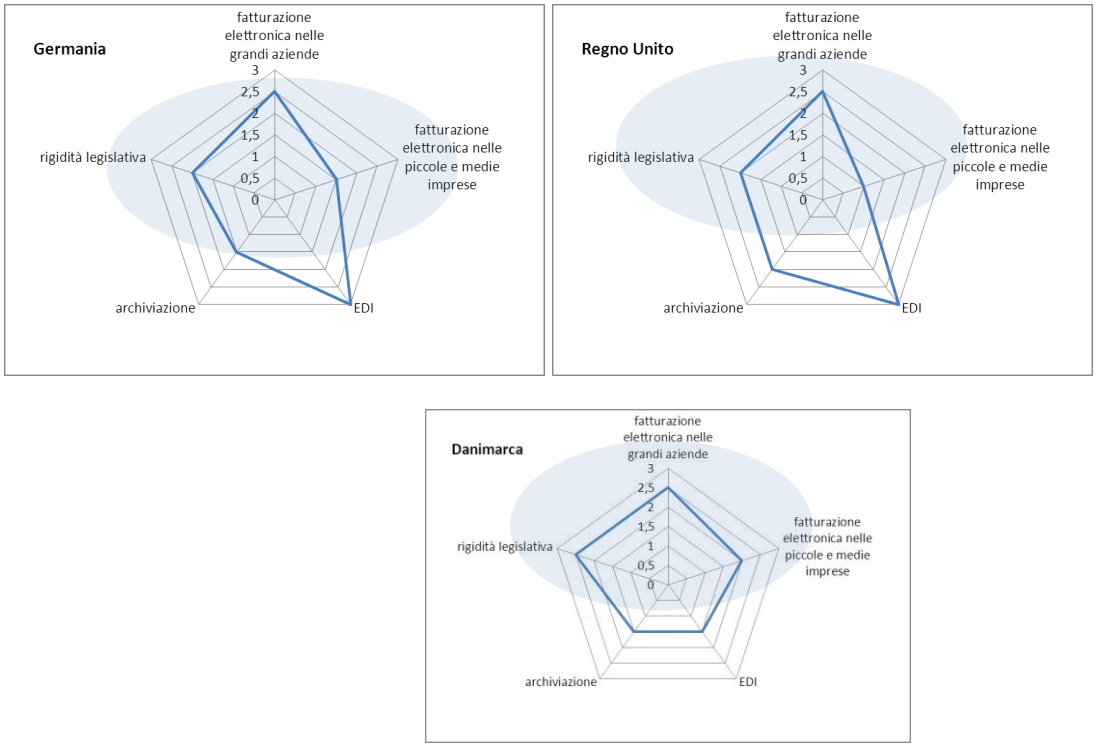
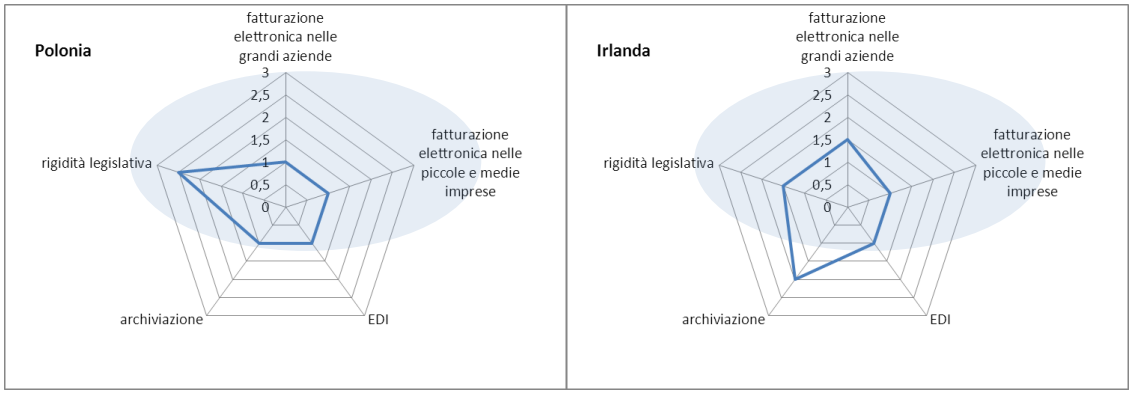


TABELLA 4A - ALTA DIFFUSIONE DELLA FATTURA ELETTRONICA CON ALTA RIGIDITA' LEGISLATIVA

- MEDIA/BASSA DIFFUSIONE DELLA FATTURAZIONE ELETTRONICA CON ALTA RIGIDITA' LEGISLATIVA



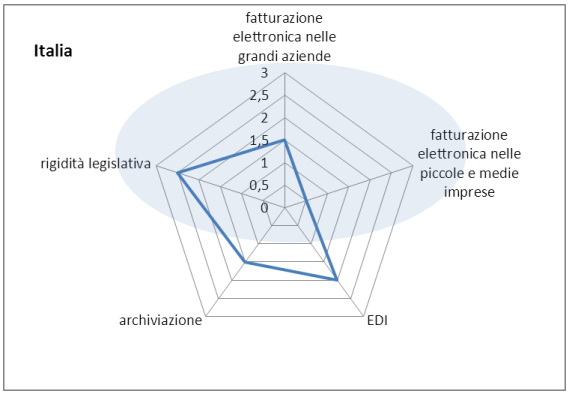


TABELLA 5A - MEDIA/BASSA DIFFUSIONE DELLA FATTURAZIONE ELETTRONICA CON ALTA RIGIDITA' LEGISLATIVA

Parlando dello zoom su Italia, Germania e Regno Unito, l'analisi è concentrate su tre aspetti principali che sono la fatturazione elettronica, l'EDI e l'archiviazione. Dalla ricerca i principali risultati ottenuti sono riportati in figura 1a:

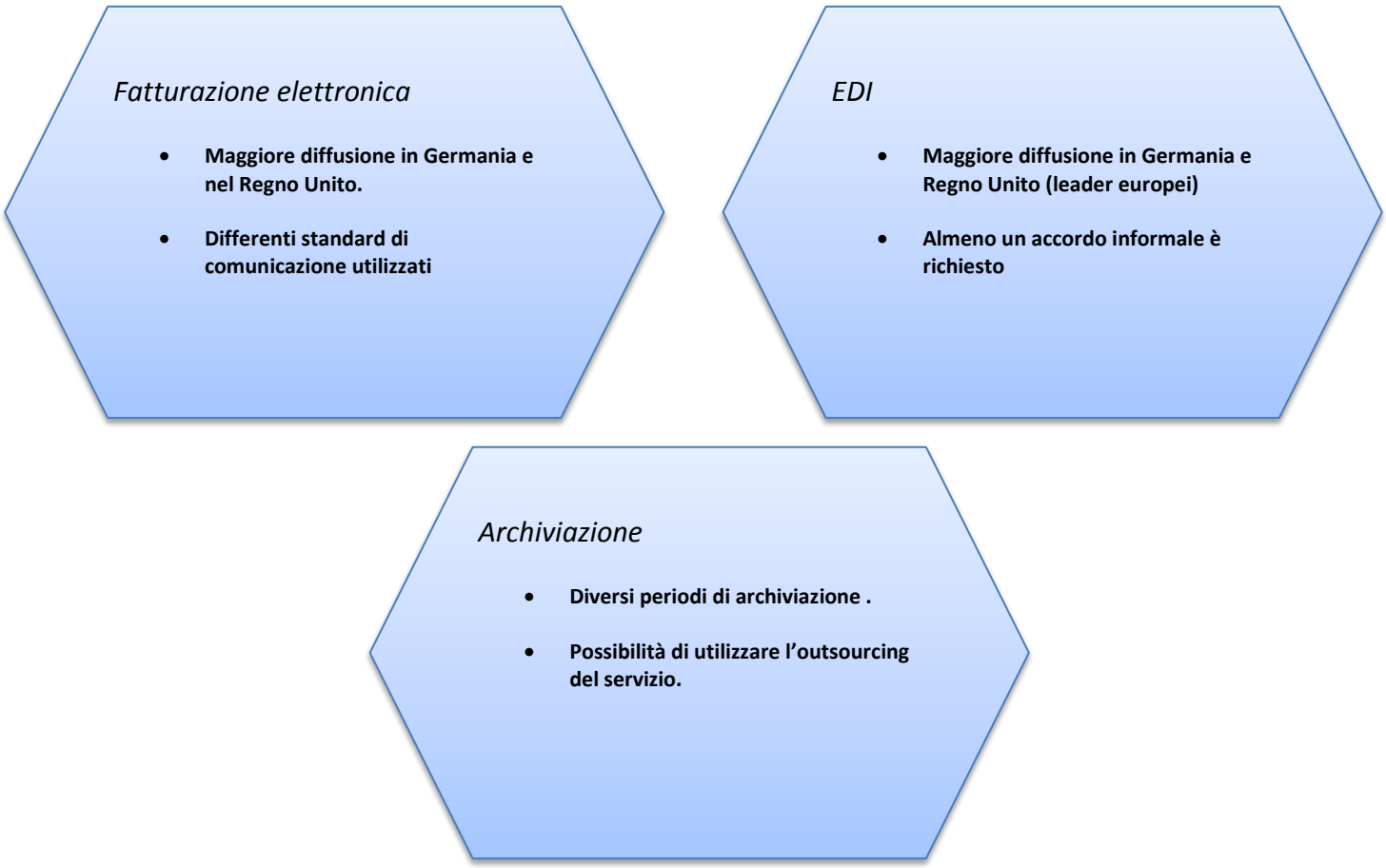


FIGURA 1A - CONFRONTO TRA LE NAZIONI

1 RESEARCH PURPOSE

1.1 INTRODUCTION

The context of analysis where the electronic invoicing takes place will be clear in this chapter that also explains the relevance of a theme that should be at the top of the economic issues in the European countries.

1.2 RESEARCH CONTEXT

Nowadays, all businesses to be competitive have to interface with technology that, thanks to his powerful tools, allows innovation and improvement of company's performances. An entity that is studying the facets of this aspect and try to diffuse the awareness that the technology is strategic for all business is the ICT & Management Observatories from Politecnico di Milano. One of these is the "Osservatorio Fatturazione Elettronica e Dematerializzazione", that is specially focused in research and analyze all the conditions and aspects involved in the development of the electronic invoicing especially in the Italian context. During the previous years, the Observatory has only partly joined the European situation. The main objective is to obtain a trustful point of view of the current status of the electronic invoicing, going in depth into the analysis of sources in different languages, classifying the results to identify patterns and trends and finally confronting the sources and the results in an effective way. The main context of analysis is dedicated to Europe, with a comparison of the level of adoption of eInvoicing and of the technologies used for the exchange of documents. In particular are analyzed the diffusion level of EDI and those standards which are typical of a specific country.

2 LITERATURE REVIEW

2.1 EINVOICE: DEFINITION AND MEANING

Electronic invoicing is one of the solutions to simplify the management of the supply chain. It is defined as the transmission and storage of invoices, without the delivery of paper documents, by electronic means (www.customs.hmrc.gov.uk, 2010). EInvoices are more than just an electronic picture of a paper invoice. With an eInvoice, a number of different intelligent solutions also occur and, with such solution well-integrated into a company's business system, a number of other functions can be added to the invoice. In this manner, companies can avoid performing manual work tasks; moreover, printing and filing paper copies will be unnecessary. It has to be noticed that eInvoicing is not the finish line of the adaptation of electronic solutions inside business processes: further steps would be the integration into more parts of the financial and business value chains. This means moving from eInvoicing (with integrated e-payment) via e-procurement (with electronic catalogues and online ordering), e-trade (with integrated e-financing and digital trade papers) finally to a fully electronic real-time economy (Salmony&Harald, 2010). Moreover the eInvoice has legal implications to both transacting parties and constitutes the basis for Value Added Tax (VAT) declaration that is a tax on consumer spending. It is collected by VAT-registered traders on their supplies of goods and services effected within the State for consideration to their customers. Each such trader in the supply chain from manufacturer through to retailer charges VAT on his or her sales and is entitled to

deduct from this amount the VAT paid on his or her purchases. The effect of offsetting VAT on purchases against VAT on sales is to impose the tax on the added value at each stage of production – hence Value-Added Tax. The final consumer, who is not registered for VAT, absorbs VAT as part of the purchase price (Ireland eInvoicing).
The project of dematerialization of the order cycle are related to three families of models that can be used in a complementary and synergic way and, therefore, lead to the digitalization of the relationship between client and suppliers (Observatory on Electronic Invoicing and Dematerialization, Oltre la fattura,2011)

- Substitute archiving: the models of Substitute Archiving refer to the process which allows the storage of accounting documents – invoices issued to the clients, received by the suppliers, accounting records ecc. – that substitutes at all the paper archiving.

  At operative level the process of substitute archiving is different according to the specific document.

- Accounting books and records*:* are generally generated with accounting systems which make simpler the management. It is necessary to put the time reference and the digital signature before the substitute archiving.

- Electronic invoicing “pura “:covers all the possible solutions aimed at digitalizing and automating the process from the invoice generation to its archiving and include models offering only a substitute mean of archiving(Observatory on Electronic Invoicing and Dematerialization, Electronic

Invoicing as a keystone in the collaboration between companies, banks and PA, 2008) . Hence, the invoice stays electronic during all its life cycle and the supplier has to include the time reference and his own digital signature in order to guarantee the authenticity. The eInvoice has to be stored according to the rules of the Substitute Archiving by the supplier and the customer. The stipulation of an agreement by the parties involved is necessary in order to guarantee that the process has been done in line with the norms and regulation of the country: client and supplier in this way make explicit the fact that they know the implications and the modalities stated by the norms on the Electronic Invoicing.

- Integration of the order to payment cycle: integration and dematerialization of the all order cycle payment. Hence, involves all the actors of the supply chain and should be the final goal of the electronic invoicing. It also implies the norms and the regulations of the specific country regarding the Substitute Archiving and the Electronic Invoicing. This kind of solution is suited for the actors of the same supply chain or belonging to the same sector (Observatory on Electronic Invoicing and Dematerialization, 2008).

2.1.1 THE ROLE OF DIGITAL SIGNATURE

The digital signature is strictly related to the concept of electronic invoices. The digital signature is defined as the set of data in electronic form, attached or connected through the logical association to other electronic data, used as a method of electronic

identification (Observatory on electronic invoicing, Report FEeD Italia digitale è possibile, 2012). For example the digital signature can be a password (i.e. PIN) or a biometric signature The EU Council Directive 1999/93/EC33 defines three forms of *electronic signature* recognized.

- *Basic electronic signature* : is the simplest and broadest sense of electronic signature as a means to identify and authenticate data (for example signing and e-mail with personal name). To be a signature, the authentication must relate to data. For example put a sign through a PIN code on an e-mail is a signature, while entering a website with the same PIN is not a signature (there is no related document).

- *Advanced electronic signature:* this form has to meet the requirements defined in Article 2.2 of the Directive. The Directive does not favor a particular technology, but in practice this definition refers mainly to electronic signatures based on a public key infrastructure (PKI). This technology uses encryption technology to sign data, which requires a pubic and a private key.

- *Qualified electronic signature:* this third form is mentioned in Article 5.1 of the Directive and consists of an advanced electronic signature based on a qualified certificate and created by a secure signature creation device (Europe's Information Society, 2011).

2.2 EINVOICING: TECHNOLOGIES AND SOLUTIONS

The eInvoicing document can be created in different forms:

- *unstructured invoice document* (e.g. Text, PDF, JPEG, TIFF, HTML or email) – in this case the document is created manually, and instead of printing it, the document is sent electronically to the receiver. An alternative is to digitalize the paper document by scanning it;
- *structured invoice document* – in this case, the creation of the document consists of a compilation of the required data defined in the selected structure. The receiver will have to be familiar with the chosen format to be able to read it.

Talking about the *structured invoice document* more in detail we have: (A. Perego, 2013)

- *(Traditional) EDI*: based on the standardized exchange of documents in a structured format (e.g. EDIFACT, international standard by UN, ANSI X12, mainly adopted in North America, ODETTE, specific of the automotive industry, etc.); integration is at data level and the business partners communicate mainly through service providers (i.e. VAN: Value Added Network).

- *Internet EDI:* Internet is used, instead of dedicated networks, as a mean of transport for the EDI documents, with a consequent reduction of the data transfer costs.

- *Web EDI:* EDI messages are exchanged through the Internet. Companies use a web browser to upload/download EDI files or to read/write EDI files through web forms.

- *XML EDI:* EDI messages are written in XML, a language that allows to add important features (i.e. functionalities, documents, etc.).

- *Extranet Web based:* company website with restricted access (according to predefined profiles) for the integrated and collaborative management of the intercompany processes. Usually an extranet allows for the exchange of resources (applications, database, information, etc.), provides services and process integration.

- *XML-based solutions:* group of technologies that goes from the asynchronous exchange of messages and documents in XML format, to the utilization of Web Services (automatic exchange of data between applications) (A. Perego, 2013).

The first solution, with a dedicated network, can be implemented only by large firms, due to the high initial investment and due to the training costs of the employees. In fact a specific communication language has to be learnt by the person in charge of this

task. All the characteristics of the traditional EDI makes it the most secure choice in terms of cybercrime (dedicated network) suited for a high number of interactions but, also, the most rigid one (standard language, very simple documents, etc.) (A. Perego, 2013).

Scanning all the other possibilities the main differential parameter is in the use of the internet instead of the VAN. The pros and the cons are dual with respect to the previous solution: can be used also by smaller firms, no particular training required, less (but still high) security, suited for a lower number of interactions and has a higher flexibility for the enormous amount of the features that can be exploited thanks to the internet. All the characteristics are summarized in figure 2.

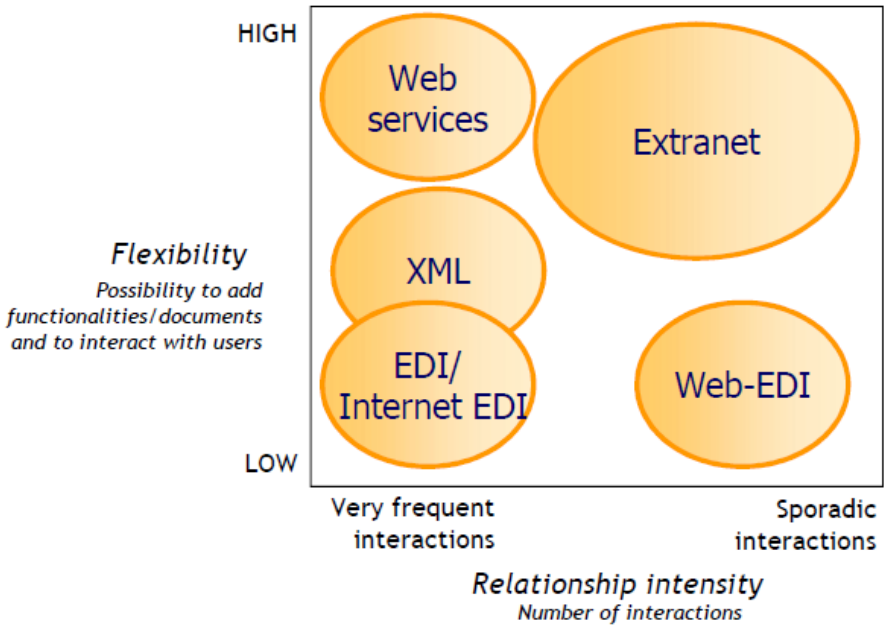


FIGURE 2 - COMPARISON OF DIFFERENT TECHNOLOGICAL SOLUTIONS SOURCE (A. PEREGO, 2013)

2.3 EUROPE 2020 STRATEGY

Europe is facing a moment of transformation. The crisis has wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. In the meantime, the World is moving fast and long-term challenges – globalization, pressure on resources, ageing – intensify. The EU must now take charge of its future. Europe needs a strategy in order come out stronger from the crisis and turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion (http://ec.europa.eu).

Europe 2020 is the European Union's ten-year growth strategy. It is about more than just overcoming the crisis which continues to afflict many of our economies. It is about addressing the shortcomings of the growth model and creating the conditions for a different type of growth that is smarter, more sustainable and more inclusive.

Three priorities should be the heart of Europe 2020:

- Smart growth: developing an economy based on knowledge and innovation.

- Sustainable growth: promoting a more resource efficient, greener and more competitive economy.

- Inclusive growth: fostering a high-employment economy delivering economic, social and territorial cohesion.

These three priorities are mutually reinforcing; they offer a vision of Europe's social market economy.

To guide the efforts and steer progress, there is a large consensus that the EU should commonly agree on a limited number of headline targets for 2020. These targets should be representative of the theme of smart, sustainable and inclusive growth. They must be measurable, capable of reflecting the diversity of Member States situations and based on sufficiently reliable data for purposes of comparison. The following targets have been selected by the European Commission (A strategy for smart, sustainable and inclusive growth, 2010):

- the employment rate of the population aged 20-64 should increase from the current 69% to at least 75%, including through the greater involvement of women, older workers and the better integration of migrants in the work force;

- the EU currently has a target of investing 3% of GDP in R&D. The target has succeeded in focusing attention on the need for both the public and private sectors to invest in R&D but it focuses on input rather than impact. There is a clear need to improve the conditions for private R&D in the EU and many of the measures proposed in this strategy are doing this. It is also clear that by looking at R&D and innovation together would get a broader range of expenditure which would be more relevant for business operations and for productivity drivers. The Commission proposes to keep the 3% target while developing an indicator which would reflect R&D and innovation intensity;

- reduce greenhouse gas emissions by at least 20% compared to 1990 levels or by 30%, if the conditions are right; increase the share of renewable energy sources in our final energy consumption to 20%; and a 20% increase in energy efficiency;

- a target on educational attainment which tackles the problem of early school leavers by reducing the drop out rate to 10% from the current 15%, whilst increasing the share of the population aged 30-34 having completed tertiary education from 31% to at least 40% in 2020;

- the number of Europeans living below the national poverty lines should be reduced by 25%, lifting over 20 million people out of poverty.

Moreover, have been established seven flagship initiative to catalyze progress under each priority theme(A strategy for smart, sustainable and inclusive growth, 2010).

- "Innovation Union" to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas can be turned into products and services that create growth and jobs.

- "Youth on the move" to enhance the performance of education systems and to facilitate the entry of young people to the labor market.

- "A digital agenda for Europe" to speed up the roll-out of high-speed internet and reap the benefits of a digital single market for households and firms.

- "Resource efficient Europe" to help decouple economic growth from the use of resources, support the shift towards a low carbon economy, increase the use of renewable energy sources, modernize the transport sector and promote energy efficiency.

- "An industrial policy for the globalization era" to improve the business environment, notably for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally.

- "An agenda for new skills and jobs" to modernize labor markets and empower people by developing their of skills throughout the lifecycle with a view to increase labor participation and better match labor supply and demand, including through labor mobility.

- "European platform against poverty" to ensure social and territorial cohesion such that the benefits of growth and jobs are widely shared and people experiencing poverty and social exclusion are enabled to live in dignity and take an active part in society (A strategy for smart, sustainable and inclusive growth, 2010).

The main point for the purpose of the thesis is the third: "A digital agenda for Europe" that is set out to define the key enabling roles that the use of Information and Communication Technologies (ICT) will have to play if Europe wants to succeed in its ambitions for 2020. The objective of this Agenda is to chart a course to maximize the social and economic potential of ICT, most notably the internet, a vital medium of economic and societal activity: for doing business, working, playing, communicating and expressing ourselves freely. Successful delivery of this Agenda will stimulate innovation, economic growth and improvements in daily life for both citizens and businesses. Wider deployment and more effective use of digital technologies will thus enable Europe to address its key challenges and will provide Europeans with a better quality of life through, for example, better health care, safer and more efficient transport solutions, cleaner environment, new media opportunities and easier access to public services and cultural content. The ICT sector is directly responsible for 5% of European GDP, with a market value of € 660 billion annually, but it contributes far more to overall productivity growth (20% directly from the ICT sector and 30% from ICT investments). This is because of the high levels of dynamism and innovation inherent in the sector, and the enabling role the sector plays in changing how other sectors do business. At the same time, the social impact of ICT has become significant – for example, the fact that there are more than 250 million daily internet users in Europe and virtually all Europeans (A Digital Agenda for Europe, 2010).

There are, however, some obstacles to be overcome. Based on consultation with stakeholders and on the insights contained in both the Granada Declaration and the European Parliament Resolution, the Commission has identified the seven most

significant obstacles. These are listed in the inner ring of figure 3. On their own or in combination, these obstacles seriously undermine efforts to exploit ICT, making clear the need for a comprehensive and united policy response at the European level.

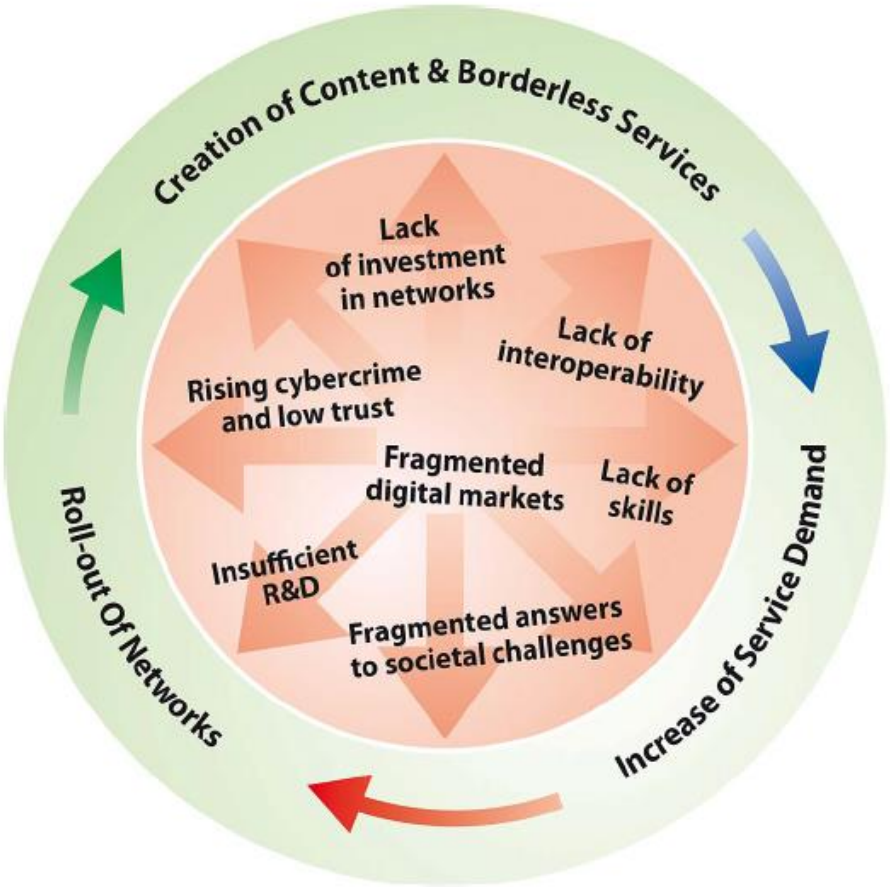


FIGURE 3 - MAIN OBSTACLES FOR ICT DEVELOPMENT. SOURCE (EUROPEAN COMMISSION 2010)

• *Lack of interoperability*

Europe does not yet reap the maximum benefit from interoperability. Weaknesses in standard-setting, public procurement and coordination between public authorities prevent digital services and devices used by Europeans from working together as well

as they should. The Digital Agenda can only take off if its different parts and applications are interoperable and based on standards and open platforms.

• *Rising cybercrime and risk of low trust in networks*

Europeans will not engage in ever more sophisticated online activities, unless they feel that they can fully rely upon their networks. Europe must therefore address the rise of new forms of crime - "cybercrime" - ranging from child abuse to identity theft and cyber-attacks, and develop responsive mechanisms. In parallel, the multiplication of databases and new technologies allowing remote control of individuals raise new challenges to the protection of Europeans' fundamental rights to personal data and privacy. The internet has now become such a critical information infrastructure for individuals as much as for the European economy at large, that our IT systems and networks must be made resilient and secure to all sort of new threats (European Commission, 2010).

• *Lack of investment in networks*

More needs to be done to ensure the roll-out and take-up of broadband for all, at increasing speeds, through both fixed and wireless technologies, and to facilitate investment in the new very fast open and competitive internet networks that will be the arteries of a future economy. Our action needs to be focused on providing the right incentives to stimulate private investment, complemented by carefully targeted public investments, without re-monopolizing our networks, as well as improving

spectrum allocation (European Commission, 2010).

• *Insufficient research and innovation efforts*

Europe continues to under-invest, fragment its efforts, under-use the creativity of SMEs and fail to convert the intellectual advantage of research into the competitive advantage of market-based innovations. We need to build on the talent of our researchers to deliver an innovation ecosystem where European based ICT companies of all sizes can develop World-class products that will generate demand. We therefore need to address the suboptimal character of current research and innovation efforts by leveraging more private investment, better coordinating and pooling of resources, 'lighter and faster' access of digital SMEs to Union research funds, joint research infrastructures and innovation clusters and the development of standards and open platforms for new applications and services (European Commission, 2010).

• *Lack of digital literacy and skills*

Europe is suffering from a growing professional ICT skills shortage and a digital literacy deficit. These failings are excluding many citizens from the digital society and economy and are holding back the large multiplier effect of ICT take-up to productivity growth. This requires a coordinated reaction, with Member States and other stakeholders at its center (European Commission, 2010).

• *Missed opportunities in addressing societal challenges*

By harnessing the full potential of ICT, Europe could much better address some of its most acute societal challenges: climate change and other pressures on our environment, an ageing population and rising health costs, developing more efficient public services and integrating people with disabilities, digitizing Europe's cultural heritage and making it available to this and future generations, etc (European Commission, 2010).

2.3.1 EU ACTIONS FOR PAYMENT UNIFICATION

Talking more in detail about the eInvoicing, Europe has a market for electronic payments and eInvoicing that is still fragmented along national borders. Only in an integrated payment market will be possible for enterprises and consumers to rely on safe and efficient payment methods. Electronic identity (eID) technologies and authentication services are essential for transactions on the internet both in the private and public sectors. Today the most common way to authenticate is the use of passwords. For many applications this may be sufficient, but more secure solutions are increasingly needed. As there will be many solutions, industry, supported by policy actions – in particular e-Government services - should ensure interoperability based on standards and open development platforms. In order to guarantee the right implementation and functioning the European Commission will ensure the completion of the Single Euro Payment Area (SEPA) for the payment integration, necessary to rely on safe and efficient methods in market which aims to be united (EBL, 2009). SEPA will also provide a launch platform for value added services linked to payments, such as the development of a European eInvoicing framework and facilitate the emergence of

an interoperable European eInvoicing framework through a Communication on eInvoicing and by establishing a multi-stakeholder forum. Another key issue for the eInvoicing will be the revision of the electronic signature directive with a view to provide a legal framework for cross-border recognition and interoperability of secure e-authentication systems and the effort of the member states to transpose the VAT Directive ensuring equal treatment for eInvoicing with paper invoices.

2.4 STAKEHOLDERS OF EINVOICING

A classification of the actors involved in the supply chain management is necessary because the eInvoicing is not a simple process to be put in place but needs the coordination and the agreement of all the entities involved in this phenomenon. Hereinafter are described the main participants, their roles and the implication of the decisions for the growth of eInvoicing.

The main stakeholders identified in the whole electronic Invoicing market and environment are (DB Research, 2010):

- Government. Since it is the enabler of eInvoicing the governmental sector has many and key roles in the process. In fact issues the laws and accomplishes the control activities, supplies the enabling tools and the technology for the digital signature which guarantee the authenticity and the origin of the documents and promotes the use of eInvoicing.

- Technology and service providers. In this category belongs different actors that are in charge to create the awareness of the benefits of eInvoicing and also to provide solutions with the right integration tools.

- Banks. This sector is fundamental for the payment cycle process, indeed the invoice is obviously paid in the bank. Moreover this actor interacts and act as consultant among the parties involved in the process and is looking for a deeper internal (inter-bank networks)and also external (between banks and companies) integration.

2.4.1 ROLE OF GOVERNMENT

Electronic invoicing could streamline government administration at a stroke, save taxpayers billions and enable the government to use its immense purchasing power to open new markets (Guardian, Stephen Partland and Adam Afriyie, 14 January 2013). Many governments have, or are considering, mandating electronic invoicing and any company doing business with the public sector will be required to issue their invoices electronically. Governments have different objectives, within Europe the aim is to capture efficiencies and cost savings but for Latin America, where tax collection is an issue, the objective is to provide transparency and capture tax revenues. The current European Commission's Multi-Stakeholder eInvoicing Forum (EMSF) is taking a similar approach with respect to the UK where there is active engagement with the private sector through interest groups such as the Forum of Private Business (FPB), the British

Chambers of Commerce (BCC) and the Institute of Credit Management (ICM). Providing open forums for discussion all stakeholders are able to provide their unique perspectives ensuring the best possible outcome. In the European commission the viewpoints sometimes are opposed, all parties gain insight and work to achieve the best way forward but there is the clear objective to ensure that all transactions are electronic and is a 'standard' mode for public procurement.

However, how these public sector systems are implemented vary from country to country, and typically (as in the B2B World) each country's program brings a brand new standard to use. One project that is attempting to bring together national initiatives in e-Procurement and eInvoicing across Europe is the Pan-European Public Procurement online project – PEPPOL (see Denmark) (Nigel Taylor, 2013). An interesting Italian government initiative is to make public via web the requirements to send electronic invoices to the public administration, making available both the syntactic standard, the structure of the invoice, and the semantic, which data have to be inserted and in which form (Observatory on electronic invoicing and dematerialization, 2009). Moreover it is important to underline the European Commission directive approval which aims to promote the use of eInvoicing in the public administration. The proposal establishes a standard model valid for all the member state of the Union, that would boost the use, and according to the estimations it will bring to potential savings equal to 2,5 billion euros. Now the eInvoice is active only in the 15% of the cases and the proposal will be transmitted to the Council of Ministries and to the European Parliament for the final approval (European Commission, 2013).

2.4.2 ROLE OF TECHNOLOGY AND SERVICE PROVIDERS

In this sector that is trying to do business creating the awareness on the need of the digitalization of the documents there are some categories to be identified.

- *Software providers* : are in charge of the selling and distribution of the technology needed for eInvoicing.

- *Banking Service Providers:* thanks to the new advanced solutions like Corporate banking interbancario (CBI is a way for banks to interact with other parties owning CBI through a personal computer and an internet connection), banks are now able to provide advanced solutions to manage the administrative-financial cycle (CBI, 2011).

- *Document Management Service Providers:* this category includes all the suppliers of solution to manage structured and non-structured documents, as well as the providers of document management services and the systems integrators (CBI, 2011).

- *B2b Service Providers:* operators specialized in solutions for structured exchange of order cycle documents and the automation of the supply chain processes (CBI, 2011).

The number of service operators has remained steady over the last number of years

(see figure 4) while for the future it is expected a growth in the eInvoicing market because there is still room for newcomers, and it is estimated that 60 new companies are likely to join the market in 2013 (Bruno Koch, 2013)

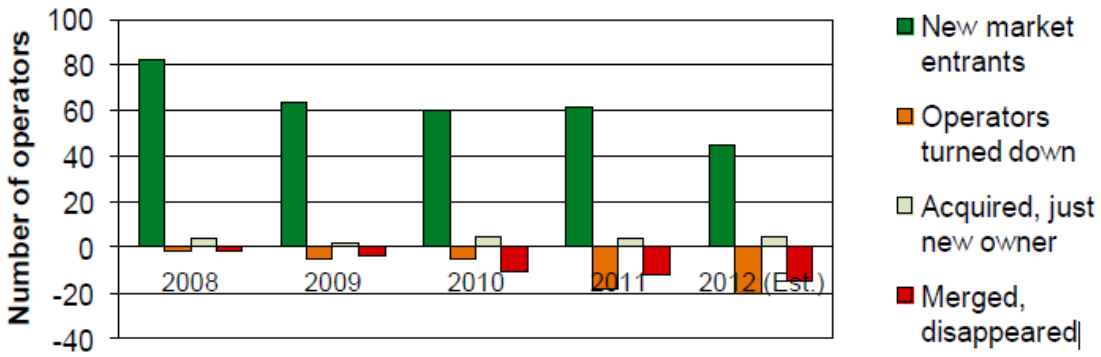


FIGURE 4 – CHANGES IN THE SERVICE PROVIDER LANDSCAPE. SOURCE (BILLENTIS, 2012)

2.4.3 ROLE OF BANKS

During the financial crisis, financial institutions dramatically reduced their exposure to the risks they had accumulated during previous phases of financial stability. Banks has to become more active in online payments (and not only because before long, the only payments will be online payments) so they should think of ways to stay close to their customers and not be dis-intermediated so much that they become invisible (Innopay, 2012). In this direction the banking sector has launched, in January 2008, the first pan- European payment tool, the so called SEPA (Single Euro Payment Area) Credit Transfer and, in November 2009, the SEPA Direct Debit. It is estimated that the national payment tools will be abandoned to be substituted with the SEPA instruments. For the banks the electronic invoicing is considered one of the key

services with high value added that they can include in SEPA offer for their customers. Some banks already deliver services with the objective of the integration of the electronic invoicing with other functionalities like the electronic reconciliation among the invoices and payment data or other financial service (European e-business lab, 2010). The banks are for sure one of the best players of theInvoicing chain and could act as invoicing consolidators, connecting and distributing eInvoices on behalf of a range of billers and buyers. The banks would no doubt face competition from IT providers and others, but their ability to integrate eInvoicing with payments and cash management should give them a golden opportunity to build large proprietary platforms for inter- and intra-company integration thanks to the development of a network (PWC, 2009).

2.5 LANDSCAPE OF EINVOICING IN EUROPE

The widely-acknowledged benefits of eInvoicing have led several EU Member States (Denmark, Austria, Sweden and Finland) to require the submission of eInvoices in public procurement in all or part of the public sector. However, these bottom-up initiatives are for the most part based on national standards, most of which are not interoperable. As such, they lead to an increase in complexity and costs for firms wishing to participate in cross-border procurement, and thereby generate market access barriers. Annual corporate and public savings of over €200 billion are estimated to be available across Europe as a whole. The overall result is that the adoption of eInvoicing in Europe is still very limited, accounting for 4 to 15% of all invoices

exchanged (European Commission, 2013). The adoption rate of eInvoicing is accelerating with varying growth rates per country and variations between business-to-business and business-to-consumer invoicing. The Nordic countries are well recognized as leaders, but many other western European countries are seeing strong growth as well. Domestic volumes predominate but cross-border invoicing is also growing, as market integration occurs at both a trade and enterprise level. In general, the current focus is on outbound and inbound volumes from and to the larger corporate entities and public administrations, especially in the accounts payable area, and mass-consumer invoicing initiatives from utilities and similar entities. The strong market power of these players is driving these developments. The role of the public sector is instrumental in some cases, for example in Denmark (Innopay, 2010).

2.5.2 EU REGULATORY FRAMEWORK

The European Union provides a uniform framework for the European market, under which eInvoicing is standardized and applicable in every European Member State. The normative is the Directive of the 13th of July 2010, n. 2010/45/UE, that replaces the Directive of the 28th November 2006, n. 2006/112/CE referred to the VAT, regarding the invoicing rules. The council directive n. 2010/45/UE came into effect the 11th of August 2010 and states that the member states have to adopt the directive by the 31st of December 2012 because the new rules must be applied from the 1st of January 2013.

Concerning the electronic invoice, the new directive, updates the following requirements:

- The eInvoices are considered legally equal to the paper invoices if they are issued and received electronically, and consequently accepted by the receiver (Directive 2010/45/UE, July 2010).

- The native electronic invoices, to be considered legally valid, must be stored electronically while the electronic invoices which were paper based can be archived both electronically and in the standard way.

- The invoices can be created in any electronic format (i.e. pdf, doc, xml..) available in the market but, in order to be considered "electronic" the issuer must assure the integrity of the document, the authenticity of the origin and the readability of the invoice. The receiver has to demonstrate his willingness to accept the invoice as electronic.

- The issuer of the electronic invoice has to respect the principles of integrity, authenticity and readability of the document from the invoice emission until the end of its archiving period.

  These requirements can be guaranteed using different methods. The first one is represented by the business control methods that have to assure a trustable link between the invoices and the related operations. The other methods are the qualified or digital signature and the electronic data interchange (EDI) where the principles are guaranteed directly by the technology (Directive 2010/45/UE, July 2010).

2.5.1 CURRENT ADOPTION OF EINVOICING IN EUROPE

EInvoicing in Europe forms part of a global trend with North America and Asia Pacific, being the areas of growing activity for eInvoicing. In all three areas, the overall penetration remains relatively low, but is growing. There is some evidence for a greater focus on EBPP in North America and on EIPP in Europe. Both areas have seen a reasonable adoption of EDI particularly in industries with tight and integrated supply chains. Both Japan and Australia have seen growing activity. It is estimated that Europe accounts for 56% of the eInvoicing market, while North America and Asia-Pacific accounts for 35% and 7% respectively as schematized in figure 5 (SWIFT, SWIFT EInvoicing Consultation, October 2008).

Country	% of e-invoicing market	E-invoicing adoption
Europe	56%	4-15%
North America	35%	3-10%
Asia-Pacific	7%	[unknown]

FIGURE 5 - RELATIVE SIZE OF EINVOICING MARKET AND ADOPTION IN THREE MAJOR GLOBAL AREAS (SOURCE: SWIFT, 2008)

The total number of invoices exchanged in Europe are about 50% in B2B and 50% is B2C. As many as 200 billion commercial documents, including payroll slips were presented in some kind of standardized form, including the invoice totals mentioned. Figure 6 shows the volume of invoices in some key European countries (EBPP/EIPP European Market Overview', Bruno Koch, Billentis)

Country	Amount (mln)	Country	Amount (mln)
Germany	6,500	The Netherlands	1,200
UK	4,200	Belgium	900+
France	4,000	Austria	800 (2006)
Italy	3,000	Switzerland	650
Spain	1,800	Finland	400
Sweden	1400	Norway	350

FIGURE 6 - NUMBER OF INVOICES IN SOME KEY EUROPEAN COUNTRIES. SOURCE (INNOPAY, 2010)

EInvoicing remains to be mainly a domestic activity, since 95% of all transactions are between entities with the same domiciliation. Nevertheless as intra-European trade grows, cross-border invoicing is also set to grow. Further, at the enterprise level integration is also taking place with the growth of shared service centers which will also stimulate cross-border invoicing. The penetration divided by country and sector is shown in figure 7.

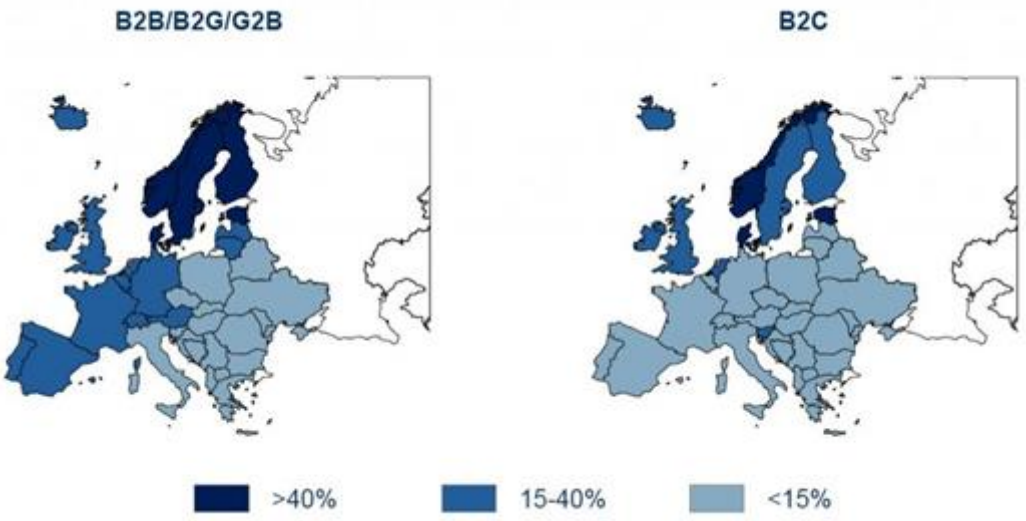


FIGURE 7 – MARKET PENETRATION OF EINVOICES. SOURCE (BILLENTIS, 2013)

2.5.3 POTENTIAL BENEFITS STEMMING FROM THE ADOPTION OF EINVOICING

In order to understand the main benefits of eInvoicing is useful to premise that is based on two fundamental principles (Observatory on Electronic Invoicing and Dematerialization, 2009):

- dematerialization: that is the ability to eliminate paper document, transforming them in electronic documents;

- integration of the processes: that is the ability to improve the services of the trade process thanks to the direct exchange of electronic documents.

EInvoicing, starting from this priciples, has several demonstrated advantages;

- Cost reduction. Electronic and automated invoice processes can result in savings of 60-80% compared to traditional paper-based processing. Projects typically result in a payback period of 0.5-1.5 years. If electronic invoices replaced a major proportion of paper invoices, the saving potential in Europe‘s public sector could be at least 40 billion Euro (for inbound and outbound invoices). Today, less than 10% of it is exploited (Koch, 2012; Watkinson, 2010).

- Quality and efficiency increase. Huge potential of better resource allocation derived from the automation of low productivity manual processing; better systems integration can enhance an easier reconciliation of purchase and delivery; furthermore the reduction of manual data entry reduced significantly the possibility of errors (Innopay, 2010).

- Better financial management . A closer integration of the physical and financial supply chain gives rise to opportunities to better manage cash flow and liquidity. The benefit is not limited to the financial part, but also the management in general can rely on more accurate information (Watkinson, 2010).

- Improved customer service. The use of electronic channels can increase flexibility and efficiency in the relation with the customer with a resultant

increase in customer satisfaction (Nienhuis & Bryant, 2010).

- Environmental savings. It has been calculated that a 1% increased adoption of eInvoicing could lead to an annual reduction of tree usage of 800,000 trees. Furthermore, the adoption of e-commerce and e-paper solutions will enable a pollution saving of 100 MtCO2 by 2020 (TheClimateGroup, 2008).

- Risk reduction. EInvoices can reduce risk as digital signature technology confirms the sender's identity and guarantees that the content has not been altered. In addition to that, eInvoicing can also eliminate error and bottlenecks and realizes the benefits of straight-through processing and automatic validation checks (Watkinson, 2010).

- Global reach. The virtual nature of the process eliminates geographical barriers and make the service available also to overseas partners (Watkinson, 2010).

The relevance of this data can be easily understood looking at the evidences coming from the cost reduction. In Denmark for example, where the eInvoicing is mandatory towards the Public Administration since 2005, it is estimated that in the public sector are handled 15 million invoices and the savings coming from the process automation have been estimated equal to 12 million euros per year(EInvoicing in Denmark, 2007).

2.5.4 MAIN EUROPEAN INITIATIVES TO PROMOTE THE ADOPTION OF EINVOICING

The European Commission wants to see eInvoicing become the predominant method of invoicing in Europe. In its Communication 'Reaping the benefits of electronic invoicing (eInvoicing) for Europe, the European Commission identifies a set of tangible actions to make the uptake of eInvoices in Europe easier. Currently, exchanging eInvoices is often complex and costly, in particular across borders and for small and medium enterprises (SMEs). The Communication by the Commission addresses these obstacles and is complemented by a Commission Decision to set-up a European multi-stakeholder forum on eInvoicing.

Existing rules governing eInvoicing in Europe are not uniform. As such the potential benefits of eInvoicing still remain to a large extent unexploited. As part of its flagship initiative, 'A Digital Agenda for Europe', the European Commission is focusing its efforts on removing barriers to the broad-scale adoption of electronic invoicing in Europe. The four key priorities on eInvoicing are (European Commission, 2012):

- Ensuring a consistent legal environment for eInvoicing
- Achieving mass market adoption by getting SMEs onboard
- Stimulating an environment that creates maximum reach between trading partners exchanging invoices
- Promoting a common eInvoicing standard

For each of these priorities, the Commission Communication set out a number of specific actions for example:

- In 2011, the Commission proposed a revision of the e-signature Directive to provide cross-border recognition of secure e-authentication systems.

- The Commission launched two new projects in the framework of the Competitiveness and Innovation Program (CIP) to help specific sectors to agree on interoperable processes for the electronic exchange of data and documents along the different steps of the supply chain (including eInvoicing).

- The European Committee for Standardization (CEN), a major provider of European Standards and technical specifications, developed a Code of Practice including consistent terminology and clearly defined roles and responsibilities for actors involved in eInvoicing.

- CEN designed implementation guidelines for a Cross-Industry Invoice data model and collaborate with international standards organizations, such as UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business) and ISO (International Organization for Standardization).

Another problem that creates resistance in the firms is the cybercrime. Global corporate losses because of cybercrime stands at around €750 billion per year (source: Allianz Global Corporate & Specialty, 2013). New illegal activities, including crime-ware distribution and the hacking of corporate databases are increasing that number. That gets one thinking.

The more widespread eInvoicing is becoming, the likelier the rest will become that cybercriminals are going to focus on (online) billing service providers. So another key action towards 2020 massive eInvoicing adoption: be sure to have made security a non-issue.

EU Member States already rank amongst the most highly infected countries in the World when it comes to computer viruses and malware. The EU is a key target for cybercrime because of its advanced Internet infrastructure, rates of adoption and increasingly Internet-mediated economies and payment systems (The impact of cybercrime on eInvoicing: five highlights)

2.6 LANDSCAPE OF EINVOICING IN THE REST OF THE WORLD

The eInvoicing around the World have passed through different processes and evolution, which depends of several internal and external factors of each country, as the economic development, the legislation, the development of the industry and, not less important, the penetration of the internet and ICT (Billentis, 2013).

- Almost all markets with classical evolution from issuer-centric B2C direct model towards recipient-driven B2B model.

- EInvoicing as real-time or near real-time audit instrument for the government; aim to reduce the shadow economy (over-/under invoicing, not declared deliverables).

- Market learned, that on-boarding of trading parties is a major project and needs budget.

At next is described the situation of the eInvoicing in each continent and reviewed the main differences and factors that influenced its development.

2.6.1 eInvoicing IN ASIA

Most countries are in evolution: large bill issuers start with “Bill Presentment” via their company portals or internet banking. EInvoicing in the B2B is often not yet legally permitted (for instance in China) or only with the explicit approval of tax authorities. However, there are some countries that can benefit most with electronic and automated processes in their role as sender as well as recipient and when paperless invoicing will be accepted they will push innovation. These countries are: Singapore, Hong Kong, Taiwan and South Korea. Despite their major importance in the World economy, Japan and India are lagging in both legal framework and adoption. The government, shipping and retail industry play a key role in the B2B/B2G segment. Even though countries such as Singapore and Hong Kong have had rather lenient regulatory

conditions for electronic invoicing and record keeping for many years, adoption levels remain low to modest across most of Asia (Billentis, 2013).

Other key issues in the Asian market are:

- government, shipping and retail industry play a key role in the B2B/B2G segment.
- Electronic trade (and financing) is more in the foreground than just EInvoicing.

A particular case is Russia where the legislation was changed in 2010 and now permits eInvoicing. (Billentis, 2011)

Australia and NZ are at a similar stage to Asia. Australians are embracing the electronic commerce phenomenon and are becoming increasingly more confident in electronic B2B transactions. At this stage, the majority of invoicing is direct via email or presented online for the user to either download or print. Some providers are also convinced that eInvoicing via digital mailboxes will play an important role in the near future. Australia's state government launched an eInvoicing pilot in 2012. Many other administrations also started electronic procurement (and eInvoicing) projects. As this is affecting many suppliers, the maturity of the market is in-creasing sharply.

The legislation is very moderate. Australian Taxation law supports the issuing of electronic invoices and the requirements regarding storage timeframes for possible audits are much the same as paper. Australia places more responsibility on businesses themselves to confirm the identity and tax status of the entity using free government look-up services, such as the Australian Business Register. Under Australian law, businesses are required to check this information before finalizing the transaction and

are required to withhold tax should the other entity not be suitably registered.

2.6.2 eInvoicing IN AFRICA

EInvoicing remains illegal in the vast majority of African countries. Some Northern African countries, such as Tunisia and Morocco, have matured regulatory and institutional frameworks for the recognition of electronic transactions (including e-signatures) in general, but they do not have specific regulations for eInvoicing. (Gartner, 2009).

Most countries are in the evolution phase: large bill issuers start with “Bill Presentment” via their company portals. Electronic Bill Presentment and Payment is already up and running in Egypt and Tunisia (Billentis, 2011).

Other important features to highlight in this market are:

- The leaders are South Africa and Kenya with higher volume in B2B and B2C.

- A South African solution provider is strongly influencing the market awareness with its‟ email based approach”, not only in Africa, but also in some Commonwealth States

2.6.3 eInvoicing IN NORTH AMERICA

North America started in the nineties with EBPP (Electronic Bill Presentment & Payment, consumer focus, 2013) and with EIPP (Electronic Invoice Presentment & Payment, business focus). Regarding a study conducted by NACHA CEBP, 5.1 billion E-Bills were delivered in 2010 in the US. The study states that E-Bills will overtake paper in 2016. In February 2012, NACHA published a white paper adding the information that nearly 30% to 40% of consumers who receive their financial statements and bills online also receive paper versions. However, even if the same strict definition of the term E-Billing is used as the one by the author, it seems that the US is still 3-4 years ahead of Europe (in the B2C segment only).

In the B2B/B2G segment, the perceptions and objectives differ broadly from the European or Latin American approach. The optimization of internal operations "order-to-cash, AR automation" and "purchase-to-pay, AP automation" is currently a main objective for US enterprises. EInvoicing is still just one feature of this internal automation process and the eInvoicing collaboration with the trading partners has not yet been discussed holistically. Various surveys imply that the US has passed the early adoption phase of electronic invoicing and that the interest in this topic sharply rises. In relation to the huge size of this market, it may come as a surprise that there are very few eInvoicing network operators in place. Because the US does not have VAT, but a sales tax system, invoices are not considered any different from other business documents. It has therefore taken some time for the value of eInvoicing network operators to become recognized on the US market, but now the number of such operators is expected to increase sharply in the coming years. Another fact might also

prove to be an accelerator for third party service providers: a high number of enterprises are interested in eInvoicing solutions, but are faced with a limited budget/funding. External services on demand instead of in-house solutions help to overcome this barrier as well (Billentis, 2013).

2.6.4 eInvoicing IN LATIN AMERICA

The landscape in South America is less developed that in the North America or the European countries, except for some initiatives in an industrialized country and multinational companies. Chile may be identified as the root of the Latin American market model and its development. Other markets like Brazil, Costa Rica, Guatemala belong to the early adopters and some of them overtook Chile due to strict obligations for the usage of eInvoicing in that country. Chile, also plans to make eInvoicing obligatory. Meanwhile, almost all other countries in Latin America are rapidly evolving (Billentis, 2013).

In contrast to the rest of the World, most Latin American countries do not focus too long on evolution. Instead, they go straight to the last stages of development. The initiator for the market activities is in most cases the government. The driver for establishing country-wide eInvoicing is often the reduction of tax evasion through real-time or near real-time invoice validation by tax authorities. This can be achieved by mandating an electronic invoice loop between supplier, the tax authorities and the supplier (Billentis, 2013).

Although the legal requirements are among the strictest Worldwide, some countries in Latin America have taken over the global leadership role. Not only do some of them

already have good market penetration rates (Brazil with 90%), but their model is also inspiring larger countries in Asia and likely soon in Southern and Eastern Europe. Typical characteristics of eInvoicing in Latin American countries are (Billentis, 2013):

- Unique/sequential invoice numbers provided by the tax authorities.

- Use of digital signatures based on suppliers' certificates, issued by approved or state-run Certification Authorities.

- Imposed XML standards for tax authority clearance.

- Steady reporting to the tax authorities: either in real-time prior to issuance or at least monthly.

- Increasing integration with the physical supply chain e.g. simultaneous print-out of ancillary transport documents based on a pre-approved invoice.

- After review/approval of suppliers' invoices, tax authorities put a visible "stamp" to the eInvoices. It is either a country specific alphanumeric code (Mexico) or a barcode (following the standard CODE-128C in Brazil and PDF417 in Chile).

- Recipients often have to validate that the invoice was pre-approved by the tax administration.

- Tax authorities validate either the invoice data real time or data-mine to check invoices later.

- General archiving period is 5 years.

Service providers play a key role. In some countries, service providers are accredited to perform clearance services on behalf of the tax administration; such service providers may also offer value-added services around these regulated functions. While many service providers are local, a good number of them are active in several Latin American countries and already process a very remarkable invoice volume. They belong to the largest operators Worldwide and some of them are now entering into the American and European market (Billentis, 2013).

Some low-hanging fruits have been picked and the government has achieved a significant reduction in tax evasion. Invoice issuers and recipients also have some benefits, as most invoices are no longer paper-based and operator fees generally remain affordable due to competition. How-ever, they made this first step under a great deal of time pressure and many of them did not have the chance to first start a company internal process optimization process. There is also still much to do to generate the maximum benefits for the enterprises and the economy. In many cases, it could also be advisable to look to Europe and the US to reduce the complexity of the

model (Billentis, 2013).

2.7 FROM eInvoice TO SUPPLY CHAIN MANAGEMENT

An invoice is the most important document exchanged among trading partners: it has not only a commercial value, but it has legal implications and constitutes the basis for Value Added Tax (VAT) declaration, VAT reclamation and declaration for intra and extra community trade. Therefore, the invoice is integral part of the supply chain management activities, so optimizing the documents' flow is basic for the improvement of the chain. In this direction, the electronic invoice, that is the generic term given to web-based services that enable purchase orders to be issued, received, approved and archived electronically (Watkinson, 2010), with the dematerialization of documents allows the process improvement at different level: from the total integration to the "simple" paper elimination.

The most common technology used for managing the information flow between large companies is Electronic Data Interchange. Even if EDI has been a key technology for efficient replenishment and supply chain coordination (Hill & Scudder, 2002), there are several barriers through which smaller companies are not able to pass: the cost of implementing EDI communication technology, and the cost of installation and maintenance of value-added networks

The problem of the expensive dedicated channel can be overcame combining EDI with the internet, and in this way diminish sensibly the costs . This does not mean that there are also structural problems. The use of EDI has always raised concerns about

security: the documents can be encrypted but they, anyway, can be victim of cybercrime.

in order to overcome the problem some companies established “Extranets” with the supply chain partners. An Extranet constitutes a private business network of several cooperating organizations, typically trading partners, customers and suppliers who form a strong communication community (Larson & Kulchitsky, 2000). In this way the information are protected and visible only to the ones that belong to this restricted circle.

In today’s highly competitive environment, companies are forced to find solutions to improve their competitive position. Has raised a concept known as “collaborative commerce” that altered the traditional relationship between suppliers and manufacturers from one of “haggling and hedging bets on product orders” (Harreld, 2001) to a mutually beneficial model that holds promise to improve the competitive position of all parties involved. The main concept that underlines and explain the content is the Supply Chain Management (SCM). SCM has become a very prominent concern for both large and small companies as they strive for better quality and higher customer satisfaction (Mentzer et al. 2000). Supply chain management seeks to enhance competitive performance by closely integrating the internal functions within a company and effectively linking them with the external operations of suppliers and channel members. Nowadays to be successful, companies will not seek to achieve cost reductions or profit improvement at the expense of their supply chain partners, but rather seek to make the supply chain as a whole more competitive (Done, 2011). In

order to get deeply the meaning of the SCM a survey was developed and distributed to 1,500 organizations throughout the United States in order to understand:

- The general reasons perceived for supply chain management implementation
- The specific goals for supply chain management

General Reasons Perceived For Supply Chain Management Implementation

Rank	Factors
1	Reduce cost, inventory, and cycle time
2	Improve quality
3	Improve delivery and reliability-improve customer service
4	Use resources that are not available internally (e.g. inability to hire employees) or access to new technology
5	Increase productivity
6	Establish a presence in a new market and/or increase market share
7	Maintain sufficient flexibility to respond to market conditions
8	Efficient use of human resources
9	Make capital funds available for more profitable operations
10	Focus on core competencies and profitability
11	Gain competitive advantage over competition HRM and information
12	Strategic supplier alliances

Specific goals Of Supply Chain Management

Rank	Factors
1	Inventory management and control
2	Transportation
3	Facilities management
4	Information technology including internet
5	Overall logistics (raw materials, work in progress, finished goods, services and related information.. to customer requirements)
6	Procurement and purchasing
7	Distribution and/or sales of products or services - delivery
8	Manufacturing of components for the final product - production
9	Manufacturing of the final product (as a whole)
10	Product design and development
11	Outsourcing of certain functions - HRM and information
12	Strategic supplier alliances

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

All the steps followed for the accomplishment of the thesis, the way data has been collected, the comparison of data between the literature and the interviews and, finally the results obtained and the process through which I highlight the results are described in this paragraph.

Moreover the instruments used and the logic behind the questions of the interviews are explained. This has make possible the measuring of the main aspects of electronic invoicing in an international and local point of view visualizing the different adopted models.

3.2 OBJECTIVES

The adoption of dematerialization services in the everyday business is continuously growing. In particular, both business operators, looking for more efficient collaborations within the supply chain, and Governments, aiming at a more transparent economy, are pushing towards the adoption of digital-based solutions. The purpose of the thesis is to define the current adoption of electronic invoicing in some countries in the World with more attention to the European situation and in particular to Italy, United Kingdom and Germany, trying to understand which are the most used mechanisms of data transmission (e.g. EDI, PDF) and data security (e.g. digital signature, time stamping). In this context is also studied:

- the regulatory framework of the countries in terms of strictness and criticalities establishing a framework of measurement and a classification of the different European Countries according to their behavioral pattern or environmental condition,

- obstacles, enablers, context conditions that affect directly the adoption and the correct development of electronic invoicing among the industries, especially in Italy, United Kingdom and Germany,

- particular actions and proposals to facilitate the adoption and diffusion of electronic invoicing in the different countries.

3.3 INSTRUMENTS

The thesis has been developed with the support of diverse instruments.
For the literature review, the first part was the reviewing of the bibliography, sources and literature managed and collected by the Observatory on Electronic Invoicing along these years, classifying the data by countries and purpose of the document with the aim of facilitating the posterior phase of data collection. The search engines were also important, in order to have updated information. In this way Google is used in the initial phase of searching for new literature and another sources of information, after are used scientific search engines as Gartner to look for specific elements and academic articles. When new data have been identified were then validate with cross-

resources.

Three other important tools were used, the comparative chart and the spider diagram at the end of each country in order to compare and summarize the most important characteristics of the specific state and a matrix that compares the main aspects of eInvoicing in Italy, Germany and UK.

3.4 DATA COLLECTION

3.4.1 SECONDARY SOURCES RESEARCH

The main phase of the data collection process is focused on the review, search and analysis of secondary sources, following an organized approach to check the existing literature managed by the Observatory and after executing iterative steps for the search and evaluation of new possible useful information. First of all has been reviewed the bibliography and existing sources identified by the Observatory, checking for useful or related information for the research. Then, iterative searches through Google and Bing have been executed with the aim of diversifying the kind of data collected and with the possibility of identifying new sources of reliable and updated information. In this way the identification of sources was possible and in particular the choice of the most important data, so it can be performed specific searches, for example in a different language or data published by specialized entities in Electronic Invoicing, by country or at European level. The data collected, were checked, looking for incongruences, repetitiveness, lack of reference or unreliable sources.

The information considered are:

- present in a coherent way in more than one source or in a document that the Observatory classified as trusted.
- present in scientific articles, academic or government reports and official data of official communities or market players. Booklets are avoided or documents with some commercial interest of certain vendors, government statistics that reflects some makeup or interest in hiding the real status and also posts in blogs or webpages without any visible or reliable support.

A clarification on the topics is useful in order to understand the criteria that led the thesis.

- The main topic of the research is the Electronic Invoicing in the different countries within and outside the European Union, identifying the main characteristics, regulations, practices and status of adoption and use at different levels (Public Administration, small medium and big enterprises, particular industry)

- Are also reviewed in depth for each country, two main aspects useful for this research: the electronic archiving and the Order to Payment Cycle integration, especially the Electronic Data Interchange. For the electronic archiving the aspects that are interesting for the research are the legislation of the time of archiving, procedures about digital signatures and time stamp and the facts or statistics that shows its use and adoption between the companies. In terms of the Order to Payment Cycle, the research is focused on how Electronic

Invoicing is integrated in this cycle, especially with the use of EDI. So the main aspects to rescue from the data are the legislation adopted, the rates of adoption and use of EDI in each country and as this aspect is not so new for the companies.

- A last clarification that has to be done is about the data selected in each country as the rate of adoption of Electronic Invoicing. With the adoption is referred to the percentage of organizations (Companies, Public Administration, SME) that use Electronic Invoicing for their regular processes. It doesn't mean that all the processes are realized with eInvoicing and also the number of invoices or number of companies issuing or receiving are not considered due to the different economies between the European Countries, so this data is better treated as the percentage of the organizations that are in the legal capacity to implement it and actually are using eInvoicing for productive purposes.

3.4.2 DIRECT INTERVIEWS

The second phase of the research is based on interviews, questionnaires and validation of data with experts. The aim of this approach is to compare the data obtained in the basic research going closer to the use and implementation of electronic invoicing, where the benefits, conditions and obstacles to the adoption can be observed more clearly. The results are summarized in a matrix with the comparison of the main aspects of Italy, UK and Germany.

The idea of this phase is not to obtain new quantitative results, but instead to get

qualitative results and opinions of people that are involved in Electronic Invoicing in the daily life and therefore give more realistic perspective on how is applied the eInvoicing and how is perceived by the different stakeholders from different perspectives. Below, there is the questionnaire sent in advance to the experts. It has not been followed literally as explained in the interviews' report.

3.4.2.1 QUESTIONNAIRE

ELECTRONIC INVOICING

1. Is the definition of eInvoice the same of the one included in the Directive 2010/45/UE, so *"electronic invoice" means an invoice that contains the information required in this Directive, and which has been issued and received in any electronic format. "* ?

   The question intent is dual. First of all to compare the definition of electronic invoice between the European normative and the country normative. Secondly to see if there is alignment between parties.

2. Is there any condition to set between the supplier and the customer, included in the normative, before the issuing of an eInvoice?

   The aims is get information about the relationship between the actors involved in the process in order to have on-field data for comparing the countries.

3. Can I use any transmission channel to issue the eInvoices? Are there particular guarantees to respect? (for instance the compulsory use of encrypted transmissions)

   This is a question made in order to obtain information about standards or laws typical of the country analyzed on the communication modalities theme.

4. Before the adoption of eInvoicing, is it necessary to communicate something to a particular Public Authority?

   This question aims to see if the Public Authority can be an actor that can slow down the process of adoption of electronic invoicing. it is important to know the experts opinion in order to find possible strategies to facilitate the process acquisition.

5. Are the eInvoicing "on- behalf" and the "self-billing" admitted procedures? is there any particular constraint or communication mechanism to be respected? Does the normative require to draw up a deal with the provider ("on-behalf") or with the client ("self-billing")?

   Understand if the "self-billing" and the eInvoicing "on behalf" are admitted, used and are working is important for the supply chain management and improvement.

6. Which kind of electronic signature is allowed and which one is the most used in your country (electronic signature (ES), advanced electronic signature (AdES),

qualified electronic signature (QES), digital signature (QES with asymmetric encryption)?

7. Is it necessary the use of the time stamping?

   The questions number 6 and 7 aim at obtaining data for a comparison among the countries standards and requirements.

ELECTRONIC ARCHIVING

8. Is it possible in your country store on paper the eInvoices issued or received?

   The normative states that the invoices natively electronic must be stored in an electronic format. Is this article totally respected?

9. Is it possible to store only in electronic format the other fiscal documents like purchase order, delivery note, journal, inventory book, purchase book, sales book? If it is possible, which are the guarantees requested by the normative regarding the E-Archiving? (for instance if it is requested a particular format, if the files should have a time stamping, if the servers should have particular certifications…)

   This question is useful to understand if all the fiscal documents are treated in the same way or not, understand the reason of the differences (if present) and compare the normative with the county's practices.

10. Is it possible to store the fiscal documents that were originally on paper only in digital format? If it is possible, the paper documents can be eliminated?

    The intent of the question is to understand in detail the process of digital archiving in order to have a clear view of the process in the country.

11. Is it possible to use the "cloud archiving" (both for eInvoices and for the other fiscal documents)? Is it possible to store the fiscal documents in an encrypted form? Is it possible to store them also in other countries (EU and non-EU countries)?

    The authorization to store files in a secure way on remote servers is crucial for the optimization of the processes. Going into details and understand if the practice is possible also abroad can be a lever to be exploited for the improvement.

12. Which are the main normative criticalities for the electronic archiving?

    In this case is requested a critical analysis and personal opinion about the regulatory framework at country level and on European level

EDI

13. Is there any requirement for the firms which issue or receive eInvoices (for instance: print summary statements of the data) ?

    As for the electronic invoicing, know the requirements of EDI communication is

crucial for the comparison of the countries and get information about the procedures to put in place.

14. How the electronic archiving works in the case of EDI invoices (both received and issued)? A firm has to keep the flow (issued or received) or are stored the PDF produced joining the EDI? Is it possible to keep the eInvoices in XML format? How is guaranteed the legibility in this cases?

    This question aims to understand the requirements of electronic archiving in case of EDI invoices and, implicitly, to understand the differences from the other methods.

15. The Edi processes follow the COMMISSION RECOMMENDATION of 19 October 1994 relating to the legal aspects of electronic data interchange?

    Understand the level of alignment between the European Normative and the country law

16. Which are the main normative criticalities, regarding the EDI and the eInvoices, included in the normative?

    Critical analysis of the regulatory framework for possible solution strategies

DEVELOPMENT POLICIES

17. According to you, what is the adoption level of eInvoicing in your country?
18. In which percentage (if not available, I bag for a rough idea) the eInvoicing is present in the small-medium enterprises of your country and in the large ones?

Scanning the information coming from the literature it is hard to find clear and univocal data about the diffusion of eInvoicing in the world and, as a consequence, going into details according to the firm size.

19. What is the level of eInvoicing in your country compared to the rest or the World (or Europe)?

    It is requested a critical comparison in order to get the point of view of an expert from another country for a wider picture. It is also an objective evidence of the source validity.

20. According to you, which kind of actions can be done in order to diffuse the eInvoicing use in your Country and in Europe?
21. Which are the industries that would take more advantage with the adoption of eInvoicing in your Country?

    These questions intent is to get from the experts, that have a deep knowledge of the topic, concepts and idea about actions for the eInvoicing diffusion and the consequent possible benefits that can arise.

3.4.3 DATA ELABORATION

The last step of the empirical analysis is represented by the elaboration of the data coming from the secondary sources and the direct interviews for the composition of the spider diagram. The axes are defined according to the most important aspects of

eInvoicing for this research and in such a way that are useful to classify and identify the patterns and conditions that characterize the eInvoicing landscape.

The spider diagram in table 6 is composed of five axes, with a magnitude from 0 to 3 that represents the level of development or qualification of each element.

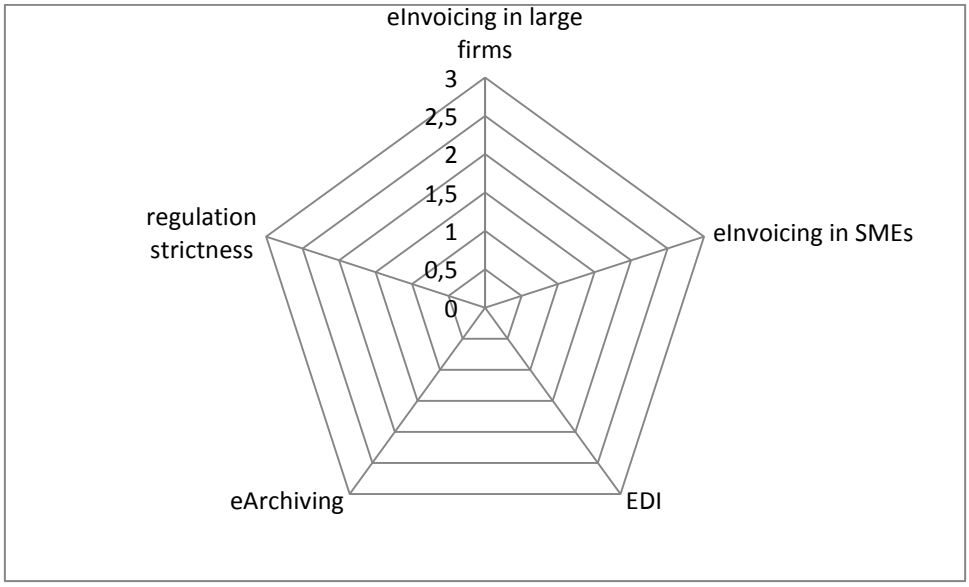


TABLE 6 - SPIDER DIAGRAM

The axes analyzed are:

- eInvoice in large firms: level of diffusion of electronic invoicing in large firms. If the value is zero means that the practice has low penetration and/or that the

regulatory framework do not facilitate the adoption. On the contrary, a well-structured law and a wide diffusion makes the value equal to 3.

- EInvoice in SMEs: the explanation is similar to the one above. The choice of this axis is led by the fact that the majority of firms are small and medium. The attention to these companies is fundamental to study the potential benefits of and the impulse to the development that the technology can bring.
- Regulatory strictness: for this parameter are considered specific requirements for the eInvoicing implementation and management like the application of the digital signature or the time stamp, or, for example, if there are specific condition for the communication. The government behavior is also important. If it is promoting the development of the practice the value is lower. To summarize: stringent regulation=3 loose regulation=0.
- EArchiving: usage and development of the practice. It is also considered the easiness to adopt and use it from a legal perspective. A low rate of eArchiving (magnitude 0), means that the country doesn't have clear rules and it is not practiced by the companies. On the contrary a high rate of eArchiving (magnitude 3) means that it is well-defined by the regulatory framework, the companies have been doing it for a while and conditions and best practices for its correct development are identified.
- EDI: diffusion level of EDI in the specific country. It is considered both in absolute value and in a comparative way. It is not easy to find quantitative data about the EDI diffusion. If the finding of exact values were impossible, it was made a comparison among the methods used for the eInvoicing transmission. If

from the sources was found that the main used methods are XML or PDF, the EDI has a low value. On the contrary if came out that the EDI is the main communication method it has a high value.

4 EMPIRICAL ANALYSIS

The data gathered from the literature and from the direct interviews are analyzed in this section.

The results are divided by country and for each of them are explained the main aspects of the regulatory framework of the electronic invoicing and the information needed in order to issue a regular digital document. Moreover, at the end, will be proposed a spider diagram in order to visualize the magnitude of the practice in the country.

Italy is taken as a reference for a comparison among the nations analyzed.

4.1 ITALY

4.1.1 REGULATORY FRAMEWORK

Electronic invoicing in Italy is possible since 2007, when was transposed the EU directive n. 115 of 12/20/2001 that had the objective to simplify, modernize and harmonize the eInvoicing procedure.

Currently the Italian Government is making electronic billing compulsory for operators that have business relations with them. In particular, Public Administrations are prevented from accepting other types of billing, besides electronic ones, and from making any payment before having received an invoice in electronic form from June 2014 (www.agenziaentrate.gov.it).

Talking about the substitute archiving, with the legislative decree of 01/23/2004, the legislator allows the firms to archive the fiscal and administrative documents only in digital format, starting both from a native digital and a paper document. Therefore, not only substitute archiving of the issued or received invoices, but also – in general –

of all the documents of the order cycle , accounting records and corporate books. Italian legislation requires compulsory digital signature for the legal validity of eInvoices. Regarding the active invoices, they are natively generated as electronic documents (with digital signature and time stamping) and can be sent to the process of substitute archiving. On a fortnightly basis, the responsible of the substitute archiving identified by the firm – who will have the task to guarantee the safeguard of the computer archives and the readability of the content – ensures the "crystallization" of the archived invoices, through his digital signature and timestamp. The invoice can be sent to the clients (not public administration) in different ways:

- via e-mail (e.g. PDF) with the digital signature,
- via EDI as the Commission Recommendation 1994/820/EC of 19 October 1994 where the authenticity is guaranteed by the technology itself,
- from January 2013 with appropriate business control methods that guarantee the 'authenticity of the origin' and the 'integrity of the content' of eInvoices transposing the Council Directive 2010/45/EU (http://eur-lex.europa.eu),
- certified electronic e-mail (CEM) that guarantees that messages and any attached documents are sent and received and attests, with legal validity, that messages have been sent and received in the same way as a registered letter with recorded delivery.

If the electronic invoice involves the Public administration there is only a method to do it. From January 2014 there are new guidelines for the transmission of electronic invoices. The document is called FatturaPA and is based on XML format.

The “Agenzia delle entrate” makes available a platform (*“Nodo dei Pagamenti-SPC”)* (Agenzia delle entrate,2014), which allows the interoperability of payments. The document, or the batch of documents, must have the certified electronic signature or a digital signature and the transmission is conditional on the presence of the unique identification code of the office to which the invoice is addressed. This method has to be operative from June 2014

For eInvoicing in Italy, until 2012, there was the need to have an agreement where the parties involved (supplier and customer) must let the counterpart knows that is willing to accept this way to operate. A formal agreement is not required but, for instance, an exchange of e-mail was enough. From the 1st of January 2013 with the acceptance of comma 325 article 1, which receipts the Directive 2010/45/EU, there is no more this need but a tacit agreement is enough to regulate the exchange of invoices which remain electronic for the whole “life cycle”: the invoices are generated, transmitted, received and archived exclusively in electronic format (further information are available in the introduction).

4.1.2 BASIC INFORMATION REQUIRED

The laws and regulations in Italy touch the two main concepts: eInvoicing and digital archiving. The main decrees are (bancadati.digita-lex.it):

- Circolare 45/E del 10 october2005: this communication tackles the issue of the “15 days”. In particular is clarifies that the electronic documents have to be archived at least every 15 days from theirs receipt.

- Risoluzione 267/E 27 September 2007: this communication defines in a clear way how the archiving should be done. In particular it underlines that the process can be different according to the document type, but the process selected must be equal for the same document type in order to guarantee the chronologic order.
- Decree of the president of the republic 633/72: this decree includes different guidelines for the eInvoicing. First of all it imposes that the documents issued in an electronic format have to be digitally managed during the whole process, archiving included (Art. 39, terzo comma-DPR 633/72). Secondly it defines the need for the digital signature and the timestamp application on the document, and it allows the usage of EDI technology as one possible validation input; furthermore, the document cannot contain dynamic contents (Art. 21, terzo comma-DPR 633/21). Finally it defines that the emission date is not the one in which the document is created, but when the document is transmitted (Art.21, primo comma-DPR 633/72).
- Risoluzione 220/E 13 August 2009: this communication defines that, for some particular documents, for example the ones produced and only available on paper, the digitalization has to be monitored by a "pubblico ufficiale", a third party that guarantees the goodness of the process.

- Other directives give other minor contributions. For example, they avoid the printing of the invoice (Risoluzione 158/E 15 giugno 2009), or impose the readability of the documents (Art. 2220, terzo comma – Codice civile) and the

timestamp (Art. 6, primo comma – DMEF 23 gennaio 2004) (bancadati.digita-lex.it).

4.1.3 FOCUS ON: BENEFITS FOR ACCOUNT PAYABLE AND ACCOUNT RECIVABLE

The substitute archiving models for issued invoices (receivables side) or those received (payables side) allow to obtain cost savings of between 1.5€ and 3 € per invoice, thanks to the reduction in costs of space and partial automation of the process. At the same time, the investments and running costs required are fairly contained. In the case of use of services of substitute archiving in outsourcing, the costs are variable and remain generally (even significantly) under 1.5€ per invoice, in relation to the volume of documents and the level of proxy. In the case of internal management, the investment necessary proves to be approximately under 100,000 €, depending on the functionality of document management and the level of integration with other company applications. The final result is a net benefit for invoicing of between 0.5 and 1.2€ for accounts payable archiving, and between 1 and 2€ for accounts receivable archiving. In both cases, the payback time is generally inferior to one year as reported in figure 8. (Observatory report 2009 Joint collaboration: a powerful driver for Electronic Invoicing in Italy)

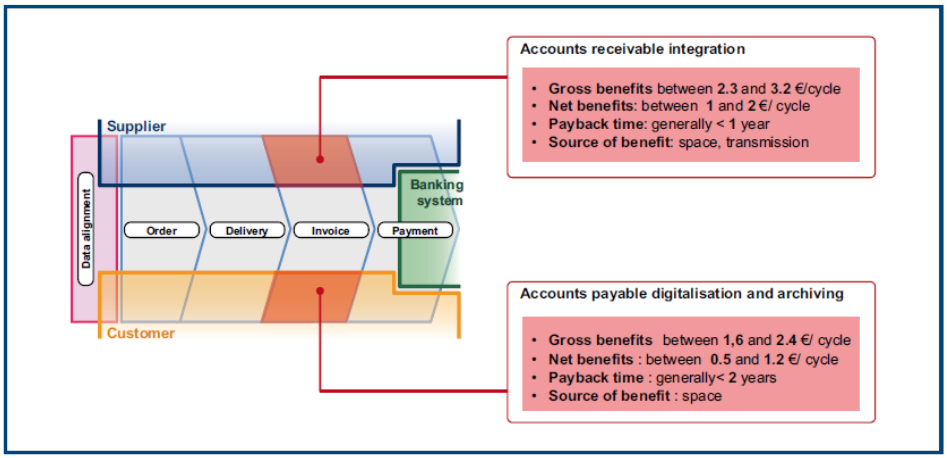


FIGURE 8 – BENEFITS OF EINVOICING MODELS. SOURCE (OBSERVATORY ON ELECTRONIC INVOICING AND DEMATERIALIZATION, 2009)

4.1.4 COMPARATIVE CHART

This chart represents the main aspects of Italy. In the following paragraphs is used as basis for countries comparison.

	ITALY	
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	
MAIN eArchiving REQUIREMENTS	eInvoices must be	

	stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	
PERCENTAGE OF DIFFUSION	About 1%	

TABLE 7 – ITALY COMPARATIVE CHART

4.1.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 8 the spider diagram that gives a picture of the dimension of the electronic invoicing in Italy, according to the procedures explained in the research methodology.

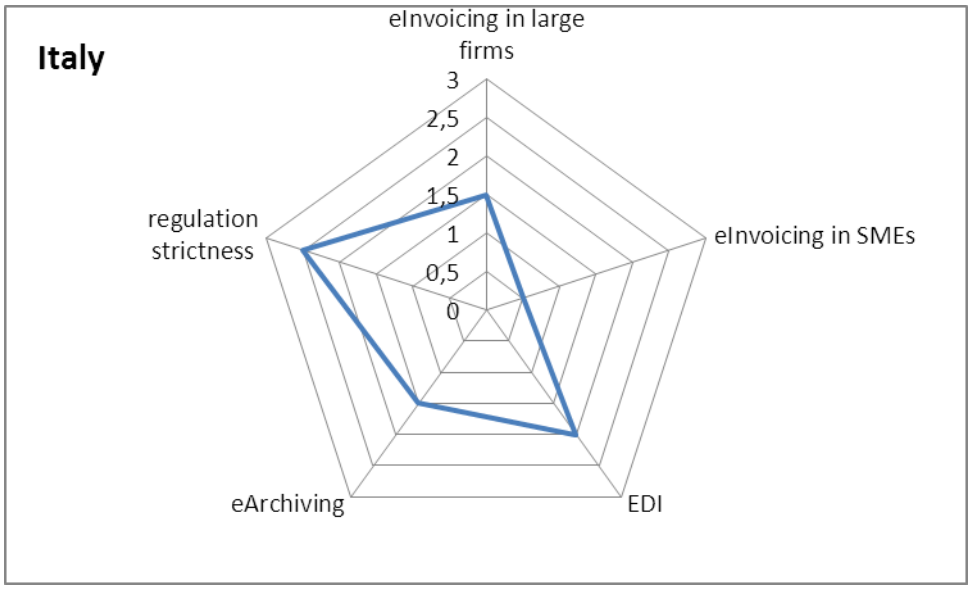


TABLE 8- ITALY SPIDER DIAGRAM

- eInvoicing diffusion: around 40%/50% of Italian firms use non-structured electronic invoicing mainly in the large enterprises. If the form considered is

only the structured one, eInvoicing in Italy covers only the 1%. A reasonable development is going to happen from June 2014 due to the fact that the eInvoicing to the Public Administration will be mandatory.

- EDI: very unbalanced. The large firms coverage is about the 40%, while in the SMEs the practice is done in the 3% of the cases .
- eArchiving: 10 years, that compared to the other countries is a lot and, the time stamping requirement makes the value quite low.
- Regulation strictness: the law is strict. It requires the use of a different format if the invoice is directed to the Public Administration or to "normal businesses". Another aspect regards the fact that electronic documents have to be archived at least after 15 days from theirs receipt. A time that is too short for all the invoices management.

4.2 UNITED KINGDOM

4.2.1 REGULATORY FRAMEWORK

A firm has to retain normal business record and two special records which are: the VAT account and a VAT invoice for supplies to other VAT registered businesses. These must be complete and up to date in order to calculate the right amount of taxes to pay. The storage period is generally 6 years but, in case of problems, the HMRC can allow to shorten the period. The documents can be stored on computer but also on microfilm but there must be the possibility to print it when requested because, otherwise, there is a financial penalty (HM Revenue and Customs, 2014).

Regarding the VAT account , that is the link between the business records and the VAT return, has to show the input and the output taxes concerning the business. A company has to send the VAT account no later than one month after the end of the accounting period in exam (***due date***) and this is extended to two months for businesses on the Annual Accounting Scheme. A company can do it also electronically normally getting extra-time after the standard due date.

Talking about the VAT invoice is just the term for an invoice which contains some information required by VAT rules. Only VAT registered businesses can issue VAT invoices and if the firm is VAT registered, must issue it whenever there is the supply standard-rate or reduced rate goods or services to another VAT registered person. Normally, a VAT invoice, must be issued within 30 days of the date of the supply. The firm involved has to be able to print the VAT invoice or, alternatively, can manage it electronically with the rules of eInvoicing.

The VAT invoice doesn't have to be issued when the customer operates a self-billing arrangement, makes a gift of goods on which VAT is due, sells goods under one of the VAT second-hand schemes and the invoice is a zero rated sale within the UK (HM Revenue and Customs, 2007).

ELECTRONIC INVOICING

The law doesn't oblige organizations to use electronic invoicing. It's up to firms whether to issue paper or electronic VAT invoices but not a dual system(both electronic and hard copy). Moreover If a supplier does eInvoicing the counterparts are not obliged to do the same. The eInvoice can be issued by a third party in your behalf and has to be in line with the requirements of your country (it can also be done by a

firm abroad). In case of a specific business where there is the need to run a dual system, the entity has to contact our National Advice Service who will look at the details and decide whether an exception can be made. From the 1st January 2006 is possible to invoice electronically without a notification. Instead prior to 1st January 2004 the issuer had to ask in order to have permission to invoice electronically. In particular from the 1st January 2004 to 31 December 2005 the responsible had to inform the will to do eInvoicing within 30 days. If the organization is sending batches of invoices to the same customer, has to record details that are common to the individual invoices once per computer file rather than once per invoice. Electronic invoices must contain the same information as paper invoices.

The company must be able to ensure the authenticity and integrity of the invoice data during the transfer between trading partners, store the invoices in a readable format, store for 6 years as paper invoices (except particular cases where it is needed to ask to the National Advice Service). It is possible to store invoices in the EU state member but the organization must still be able to produce any records required in a readable form, and within a reasonable period of time, at a mutually agreed place(HM Revenue and Customs, 2007).

It is recommend to maintain on-line access to the records if stored outside the UK and it is also possible in a non EU member if respects all the requirements.

Regarding the self-billing there is an arrangement between a supplier and customer in which the customer prepares the supplier's invoice and forwards a copy to the supplier with the payment. There must be an agreement among the parties, raise self-billed invoices for all transactions with the supplier named on the document for a period of

up to 12 months, set up a new agreement if your supplier transfers his business, both you and the individual who has bought the business want to continue operating self-billing and keep all the information written on the VAT invoice. It is not possible to do self-billing on behalf of suppliers who are not registered, or who have deregistered and to the supplier that changed his VAT registration number until a new self-billing agreement have been drawn up. If the rules are broken there will not be evidence of the right to deduct input tax and the supplier will have to issue his own invoices. Anyway a firm is not obliged to accept to do self-billing.

It is also possible to do self-billing outside UK, both inside and outside EU if are respected the conditions of the member state. If the parties raise an "electronic invoicing self-billing agreement" have to be aware that may occur some problems with the electronic method used and that if the document is going to be sent in UK it must be issued in a format which meets UK requirements and which the accounting system can accept.

In UK if the invoice does not exceed £250 and the supplier is other than to a person in another member State, the VAT invoice that a registered person is required to provide, need contain only the following particulars (The Value Added Tax (Amendment) (No. 3) Regulations 2012)

(a) the name, address and registration number of the supplier;

(b) the time of the supply;

(c) a description sufficient to identify the goods or services supplied;

(d) the total amount payable including VAT; and

(e) for each rate of VAT chargeable, the gross amount payable including VAT, and the VAT rate applicable.

4.2.2 BASIC INFORMATION REQUIRED

The following list contains all the minimum data required in a document such as an electronic invoice, credit note or debit note.

With the following requirements is guaranteed the originality of the invoice to which the organization refers to.

- An identifying number
- The time of the supply (both the invoice issue date and the time of supply date if the two dates are different).
- The date of the issue of the document
- The name, address and registration number of the Supplier
- The name and address of the person to whom the goods or services are supplied
- A description sufficient to identify the goods or services supplied for each description, the quantity of the goods or the extent of the services, and the

rate of VAT and the amount payable, excluding VAT, expressed in any currency

- The gross total amount payable, excluding VAT, expressed in any currency

- The rate of any cash discount offered

- The total amount of VAT chargeable, expressed in sterling

- The unit price

The company, who does the electronic invoicing has to guarantee the authenticity of the origin and integrity of the invoice data. This can be achieved by:

- advanced electronic signature. In this way the invoice is uniquely linked to the signatory and capable of identifying it. It Is created using means that the signatory can maintain under his sole control and is linked to the data to which it relates in such a manner that any subsequent change to the data is detectable,

- electronic data interchange (EDI) that is a computer-to-computer exchange of structured data that permits automatic processing by the recipient.

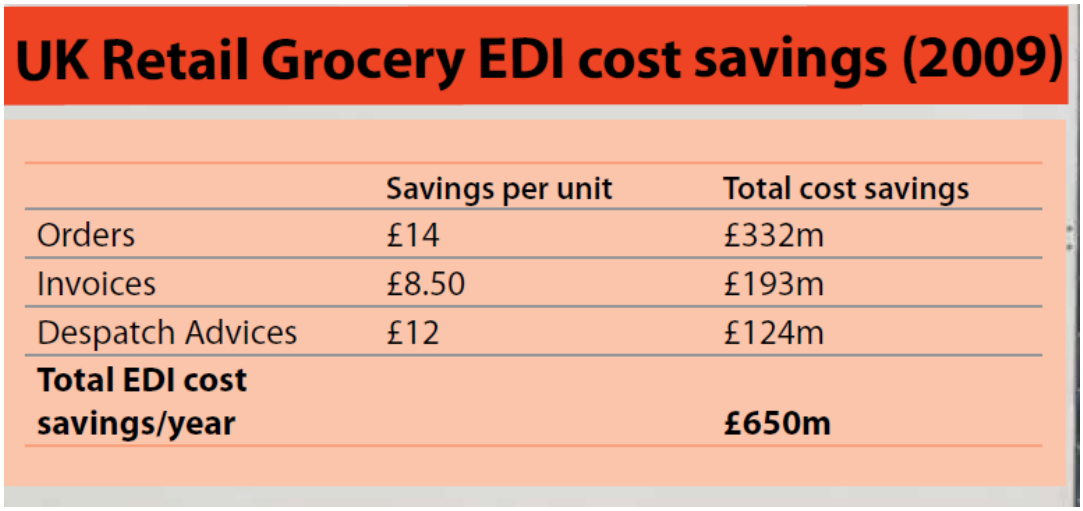
- other means for supplies within the UK. For instance: security of networks/communication links; access controls; and message transfer protocols (for example, http-s). (HM Revenue and Customs, 2014).

4.2.3 FOCUS ON: GROCERY INDUSTRY

GS1 (an international non-profit association dedicated to the development and implementation of global specification to management of supply and demand chains across multiple sectors) UK's research has found that the UK retail grocery sector in 2009 saves £650 million per year in costs by using EDI instead of manual, paper-based processes for its orders, invoices and dispatch advices. £14 per order cost saving gained when using EDI compared to manual processes including phone, fax, post and email to order stock from suppliers. By using electronic order messages for 87% of its purchase orders, the UK grocery sector has saved £332 million in 2009 (Edi Cost Savings Report, 2010).

GS1 industry research also identifies a £8.50 cost saving per invoice when companies use EDI instead of paper-based invoices. By using electronic invoice messages for 84% of its purchase orders, the UK retail grocery sector has saved £193m in one year. Industry research identifies that the sector can save £12 per order in cost if an electronic dispatch advice is sent to trading partners before the order is delivered.

Based on industry implementation levels of dispatch advices (38%), a further cost saving of £124m has been achieved by adopting EDI over manual, paper-based methods. All the data are summarized in the figure below.



UK Retail Grocery EDI cost savings (2009)

	Savings per unit	Total cost savings
Orders	£14	£332m
Invoices	£8.50	£193m
Despatch Advices	£12	£124m
Total EDI cost savings/year		**£650m**

FIGURE 9– EDI COST SAVINGS. SOURCE (EDI COST SAVINGS REPORT, 2010)

4.2.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	UK
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	There aren't government promoted standards
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	e-mail, document attachments to emails, EDI, XML, business control methods
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	No, the government isn't sensitive to the topic

MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	The most important thing is that the content of the invoice is coherent and justifiable. If the eInvoicing process is outsourced there must be an on-line access to it
PERCENTAGE OF DIFFUSION	About 1%	Between 15% and 40%

TABLE 9 – UK COMPARATIVE CHART

4.2.5.1 DIRECT INTERVIEW: Tony Nisbett

Tony Nisbett is the vice-president of the public relations of an important firm that studies the global situation of electronic invoicing: TRUSTWEAVER. He has been involved in electronic trading for over 25 years.

The interview has been done by phone at the Observatory in Milan and started with a brief introduction about observatory's tasks and objectives to realize.

After that, we jumped into the topic. The interview was structured as a conversation about a specific topic roughly following a questioner that was delivered in advance to Tony.

What electronic invoicing is meant to be in UK from a regulation point of view and from a real perspective ?

There is no clear definition of electronic invoicing and there isn't a clear normative about it. The document doesn't have to be signed by the issuer or stored in a specific way. So it is a very relaxed document. The government doesn't care too much about the topic in fact you can also send an electronic invoicing as attachment to an e-mail.

According to Tony this is not the right way to manage the electronic invoices and there is the need to structure more the normative giving more precise guidelines and someone should be in charge to monitor the process.

What happens to other fiscal documents (e.g. delivery note)?

Is the same of electronic invoicing. The fiscal agent may don't ask you about the electronic document, and they don't care about the procedure followed. If they ask about it the only thing that matter is that the numbers of the electronic document and the one of the paper document are the same.

What about EDI? Is the process different?

EDI is a process established from a very long time mainly in the fast moving consumer goods industry to manage the just in time and daily activities but, regarding the eInvoices, the flow of it is usually on a monthly basis. EDI is most used by big firms with high volume of documents and UK is the third largest country in Europe after Germany and France in terms of EDI volumes. Other ways to interact are for example the FIP or I-DOCS that you can deliver in any way you want.

Do you see any negative aspect in using EDI in a business process?

Tony said that he has never understood how EDI as a process covers the requirements to keep the data for the next years because there are no specific forms to store or send the document through this channel as for the others. The supplier can send it in any format and the receiver can change the format and so store the document in a different way. This can leads to a change in the document that is not tracked an hence to a loss of authenticity and integrity.

What do you think about extranet or web portal, where partners can exchange their documents in a PDF or XTML format?

It is a good way to interact for small and medium enterprises and it is a very common and diffuse practice. Also in this case the government doesn't care to much about the format even if has the infrastructures and potentialities to manage the flow of electronic documents.

In Italy is required to keep a register to summarize the sales and the purchase, which kind of practises are used in UK?

Is it compulsory to maintain a sales and purchase register and individual records at data level. You have to maintain the details of the trading partners (name ,address..) and a description of each transaction.

Are these document paper based only?

They are natively paper based .You can produce also an electronic document, and the important thing is that the numbers are coherent.

4.2.5.1 DIRECT INTERVIEW : Ara Martirossian

Ara Martirossian is the CEO of Red IT Solutions Limited (www.red-it.co.uk) that was formed in 1999 and specializes in providing solutions, bespoke development and integration services based around Sage and Microsoft solutions. He has experience of analyzing and implementing business processes and IT systems based on leading technologies to make companies run more efficiently.

The interview has been done through a call via Skype at the Observatory in Milan and started with a brief introduction about observatory's tasks and objectives to realize.

In order to do an electronic invoice, there must be an agreement between the parties?

No, the actors involved don't have to do that.

Which are the modalities of the process?

There are different ways to do electronic invoicing. The simplest way is to send a PDF of the invoice and that allowed the person who receives it to import it.
The "proper" way through which companies exchange eInvoices is called EDI where there must be an agreement because a specific technology is needed. If you receive an invoice via EDI you must answer in the same format. This is the most diffused method in UK and, in particular, in the fast moving consumer goods industry.

How can be stored these data? Are there specific regulations?

There are two different relationships: EDI and non-EDI. In the first case the invoice, from a legal point of view, must be stored electronically and the EDI technology guarantees the authenticity and readability of the document for the fairness of VAT and taxes. In the second case there are different format for the data exchange (e.g. PDF). These are not pure electronic invoices and you can print them.

What happens to the other documents sent via EDI, like the dispatch advice?

You can store it in the customer's or supplier's accounting system. All the activities must be electronic from the purchase order to the dispatch confirmation, and are not printed.

Are there particular incentives or initiatives by the British government for the diffusion of electronic invoicing?

It is not a government driven process but a customer driven process. In fact send electronic invoices allows companies to cut costs.

When you talk about EDI do you also include WEB EDI systems?

No, because for EDI I mean end to end connection without human intervention. In this case I don't define it electronic invoicing.

What is your honest opinion on electronic invoicing in UK?

It should be used more often, but the technology costs and in order to spread this practice it should be cheaper. It will not be widespread in the upcoming years.

4.2.6 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 10 the spider diagram that gives a picture of the dimension of the electronic invoicing in UK, according to the procedures explained in the research methodology.

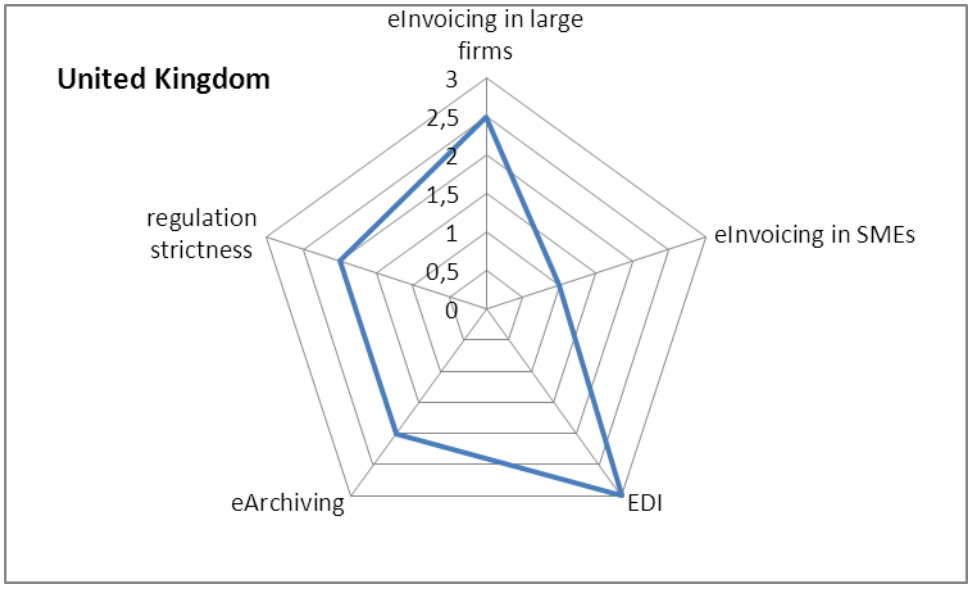


TABLE 10 - UK SPIDER DIAGRAM

- eInvoicing diffusion: about 40% of the invoices are electronic. The practice is very diffused in the large firms (mostly EDI) while, in the SMEs the value is much lower mainly due to the little attention of the government to the topic.
- EDI: very diffused. UK is the European leader with Germany. The practice is very diffused in the fast moving consumer goods industry.
- EArchiving: 6 years and allowed in all the countries that respect the European requirements if they can guarantee the on-line access to the invoice. The principles of authenticity, readability and integrity are requested.
- Regulation strictness: loose regulation but the government doesn't care too much on the topic especially for the electronic invoicing in the SMEs where there is no help and interest.

4.3 SWEDEN

4.3.1 REGULATORY FRAMEWORK

Invoices must be issued in the cases set out in Article 220 of the VAT Directive 2006/112/EC, i.e. supplies of goods or services made by taxable persons to other taxable persons or non-taxable legal persons, and also distance sales and sales of new means of transport, irrespective of the person to whom the supply is made. Invoices must also be issued for the supply of construction or development services to non-taxable people and of goods sold in association with such provision. Invoices must also be issued for payments on account (European Commission, 2010).

Under certain circumstances, there are exemptions from the obligation to issue invoices:

- sale and letting of buildings according to Chapter 3 section 2 of the Swedish VAT Act

- services constituting medical care, dental care or social care (Chapter 3 section 4 of the VAT Act)

- educational services (Chapter 3 section 8 of the VAT Act)

- banking and financial services (Chapter 3 section 9 of the VAT Act)

- insurance and reinsurance services (Chapter 3 section 10 of the VAT Act)

- certain cultural services (Chapter 3 section 11 of the VAT Act)

- services involving admission to sporting events or participation in sporting activities (Chapter 3 section 11a of the VAT Act)

- advertising in VAT-exempt periodical members' bulletins, staff newspapers and periodical publications issued by non-profit-making organizations/associations (Chapter 3 section 19 point 1 of the VAT Act)
- production and broadcasting of radio and television programs (Chapter 3 section 20 of the VAT Act)

- supply of prescription drugs, breast milk, human blood or organs, (Chapter 3 section 23 points 2 and 3 of the VAT Act)

- lotteries, including betting and other forms of gambling (Chapter 3 section 23 point 5 of the VAT Act)

- services supplied by independent groups of persons who are carrying on activity which is exempt from VAT, for the purposes of rendering the services to their members (see Article 132(1)(f) of the VAT Directive and Chapter 3 section

23 of the VAT Act)

- passenger transport deemed to be supplied outside Sweden (Chapter 5 section 1 of the VAT Act) (European Commission, 2010).

It is also important to highlight the fact that eInvoicing towards the Public Administration is mandatory since 2008 and this has been a catalyst for the practice diffusion. The government also promotes a particular standard for eInvoicing: Svefaktura. The method is based on XML format (preferred in many Nordic countries) and is very hard to be customized because of the strict rules on which is based.

4.3.2 BASIC INFORMATION REQUIRED

The Swedish VAT Act accepts that electronic invoices may be sent by electronic means in accordance with the second subparagraph of Article 233(1) of the VAT Directive. The underlying condition according to the Swedish Accounting Act and Tax Payment Act for both paper-based and electronic invoices is that they must be correct and may not have been altered. The legislation does not indicate any specific method for safeguarding the integrity of an invoice. The Swedish Tax Agency has been given powers to issue regulations concerning electronic invoices as necessary, but has not yet issued such regulations. At the moment there is no provision in the VAT Act on time limits for issuing invoices.

Accounting material, including invoices, may be stored outside Sweden but within the EU if the company:

- notifies the Swedish Tax Agency (and in certain cases the Swedish Financial Supervisory Authority), before storage begins, of the place of storage and of any change of place of storage,

- allows immediate electronic access to the accounting material at the request of the Tax Agency or Swedish Customs during the storage period

- is able to produce, by immediate print-out, the accounting material in Sweden on paper or microprint (European Commission, 2010).

The Accounting Act also permits storage of accounting material in a country outside the EU with which legal instruments exist containing provisions relating to mutual assistance similar in scope to those provided for by Regulation (EC) No 1798/2003 and the right of access by electronic means, download and use referred to in Article 249 of the VAT Directive under the same conditions as set out above.

The Tax Agency must be notified in advance when invoices are stored in another country, and when the place of storage changes. For companies under the supervision of the Swedish Financial Supervisory Authority, notification must be made to that authority.

Under the Swedish Tax Payment Act, invoices must be stored for seven years. The storage period is ten years for companies to which the Swedish Accounting Act is applicable.

According to the main rule of the Swedish Accounting Act, the invoices must be stored in the same form in which they were received by the company. Accounting material prepared by the company must be stored in the form it was in when it was compiled. Received accounting material can be converted from electronic form to paper after three years from the end of the calendar year in which the financial year ended, if this is performed in a secure fashion.

According to the fourth paragraph of Article 226 of the VAT Directive the customer's VAT identification number, under which the customer has received a supply of goods or services in respect of which he is liable for payment of VAT or has received a supply of goods as referred to in Article 138, is required for VAT purposes on the invoice. This Article has been transposed into the Swedish VAT Act. It follows that the VAT identification number of the customer should not be stated in other cases.

Tax returns can be submitted by electronic means online. The taxpayer must first obtain approval from the Tax Agency, however. The application is made on form SKV 4801. A security certificate is required for the electronic submission of a tax return. Almost all traders can submit electronic tax returns. There are, however, still some restrictions, the most important is that a Swedish address and personal identity number, or corporate registration number, are necessary to obtain a security certificate (European Commission, 2010).

4.3.3 FOCUS ON: EINVOICING IN BANKS

The Swedish Bankers Association reported that the use of electronic invoices has hit new records. The number of eInvoices sent to private people increased by 34 percent.

Today, one in three people accepts e-invoices. The winner is the environment, according to the Swedish Bankers Association.

According to research carried out on members of the Bankers' Association who offer eInvoices as well as a number of invoice issuers the number of e-invoices sent out the 14 percent of all internet payments.

The potential is still great and the goal is that even more invoices will be sent out electronically. The continued development of user-friendly e-invoice services is key to success according to Johan Schmalholz, that is an eInvoice expert at the Bankers' Association.

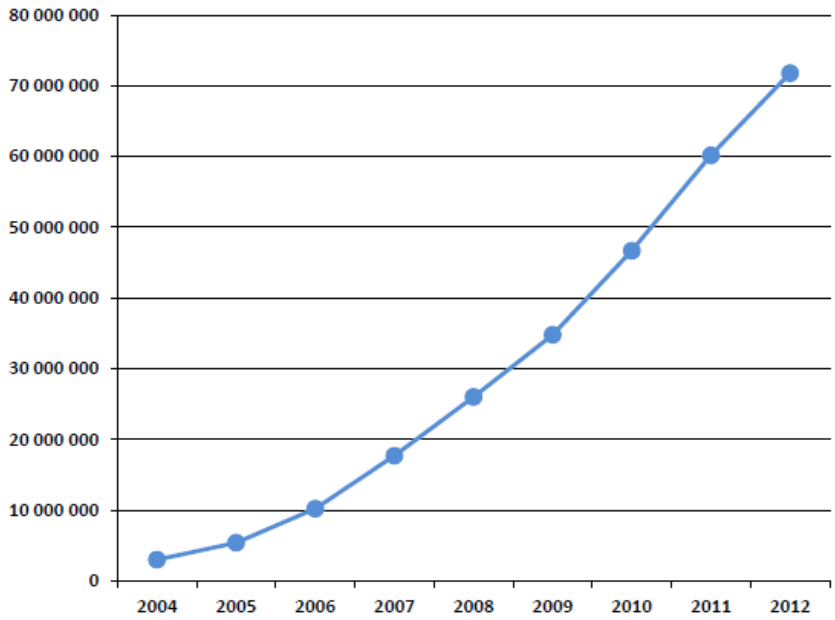


FIGURE 10 – EINVOICING IN BANKS. SOURCE: (EEIPLATFORM)

4.3.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	SWEDEN
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	The government developed Svefaktura (SwedInvoice) with the goal of "the simplest approach possible." The standard includes XML messaging specifications, communications and security protocols, but offers very limited opportunities for customization.
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	Any communication method that allows to respect the law constraints.
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	Since 2008 eInvoicing has been mandatory in dealings with the public sector. It fully enabled e-invoicing from July 2008 for public procurement
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required	There are no particular requirements.

	for the substitute archiving	
PERCENTAGE OF DIFFUSION	About 1%	Over 40%

TABLE 11 – SWEDEN COMPARATIVE CHART

4.3.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 12 the spider diagram that gives a picture of the dimension of the electronic invoicing in Sweden, according to the procedures explained in the research methodology.

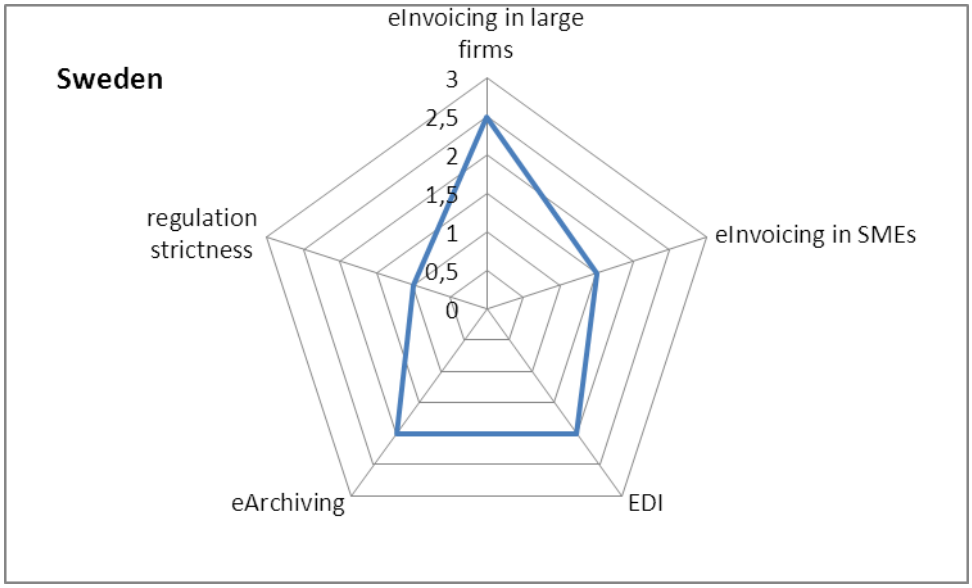


TABLE 12 – SWEDEN SPIDER DIAGRAM

- eInvoicing diffusion: over the 40% of the invoices are electronic. In Sweden there is a great diffusion in the large enterprises and also a good percentage of SMEs are adopting the practice. The main reason is, probably, that electronic invoicing is mandatory towards the Public Administration.

- EDI: quite diffuse in the large companies and in the SMEs has a low adoption. The main method used is the Svefaktura (SwedInvoice) that is based on XML language.

- EArchiving: 7 years, archived in the same format as received. If an invoice arrives paper based it can be turned into electronic format after three years.

- Regulation strictness: no particular requirements. The document as to respect the principles imposed by the law

4.4 IRELAND

4.4.1 REGULATORY FRAMEWORK

It is open up to traders to operate an electronic invoicing system provided the particulars to be contained in such invoices or other documents are recorded, retained and transmitted electronically by a system that ensures the integrity of those particulars and the authenticity of their origin (European commission, 2010).
Invoices, may be transmitted between trading partners using either an electronic data interchange (EDI) system, or an advanced electronic signature (AES) and associated system, which satisfy the requirements set out. A taxable person may also use a different electronic system to the EDI or AES systems, provided the requirements in question are met and the person notifies the Revenue Commissioners accordingly.
The electronic system in use must be capable of:

- producing, retaining, storing, and making available to a Revenue officer on request, electronic records and messages in such form and containing such particulars as are required for VAT purposes,

- reproducing paper copies of such records or messages,

- allocating a unique identification number for each message transmitted, and

- maintaining the electronic records in such manner as allows their retrieval by reference to a trading partner or the unique identification number of the message.

The system in use must also :

- preclude the repeated transmission of a message and the omission of a message from the electronic record,

- verify the origin or receipt of a message from a trading partner, and

- guarantee the integrity of the contents of a message or an electronic record related to that message during transmission and during the period for the retention of records for VAT purposes.

Every taxable person must retain all invoices, credit notes, settlement vouchers and debit notes issued to another person relevant to the business. These documents and the relevant books and records must be preserved in their original form for 6 years from the date of the latest transaction to which they refer, unless the written permission of the local Revenue District has been obtained for their retention for a shorter period (European commission, 2010).

This rule applies equally to electronic records and messages. In addition, a taxable person keeping electronic records must retain and store particulars such as details of the form of encryption, electronic signature, etc used and the format in which they are stored and how they can be accessed.

4.4.2 BASIC INFORMATION REQUIRED

In general a VAT invoice has to be issued within 15 days by the end of the month in which the goods or services are supplied. In the case of a supplementary invoice, the invoice must be issued within 15 days following either the day on which the increase in consideration is paid or the day on which the increase in consideration is agreed between the parties concerned, whichever is the earlier.

Situations may arise where payment in full, or by installments, for goods or services supplied to a VAT-registered person is made before the completion of the supply. In such cases the person receiving payment must issue an invoice within the 15 days following the end of the month during which each payment was received. This rule does not apply in the case of intra-Community supplies of goods.

Failure to issue an invoice in time leaves the person concerned liable to penalties.

No specific certification is required for eInvoices. Advanced electronic signatures are defined in Regulations. The definition lays down high level criteria which are technology neutral and if the invoice is issued in accordance with these criteria it is acceptable. No additional summary documentation is required. However, taxable persons are required to produce paper copies of specified invoices following a request by a tax official(European commission, 2010).

4.4.3 FOCUS ON: INVOICE OUTSOURCING

Ireland allows companies to rely on third-party entities for electronic invoicing services, if all pertinent regulatory and legislative conditions are met. A single service provider can deliver electronic invoicing services to all participants in a trading relationship (suppliers and buyers) in Ireland, and can also electronically sign eInvoices with its own advanced electronic signatures. In this case, all requirements pertaining to authenticity, integrity, and archival of invoices and signatures must be adhered. When services are delivered to both sellers and buyers in a single trading relationship, service providers are advised to maintain the privacy of each party with regards to data, transactions, and processes. For example Ariba (a company that facilitates and act as consultant in the B2B sector), as a third-party, is allowed to perform verification checks on advanced electronic signature certificates for, and on behalf of, invoice recipients, even if Ariba, or a third party on behalf of Ariba, issued the certificate (Ariba, 2009).

On 6 June 2013, new conditions were introduced by ComReg. In fact it was introduce a fierce consumer protection approach against providers charging their clients for paper bills that effectively came into effect at the beginning of August 2013. The requirements to be respected are:

1. *Bills for post-paid customers must be provided free of charge*

   This applies in respect of a fully itemized bill or a non-itemized bill, in line with the customer's preference.
2. *Pre-paid customers must be able to require a transaction history (including usage and charges) free of charge*.
3. The post-paid customer's explicit consent is required to change the level of bill itemization. Calls which are normally free of charge should not be identified/itemized however, for either post-paid or pre-paid customers.
4. Customers who are asked to switch from paper bills to e-bills must be notified one month in advance and are allowed to withdraw from his/her contract free of charge if he/she does not wish to be moved to e-billing.
5. Service providers currently providing paper bills may migrate customers to alternative billing mediums (e.g., e-bills) provided that they can ensure and verify the customer can access the alternative medium.
6. When using online bills, an alert must be sent to notify the customer that a bill is available; the alert should be sent during appropriate – sociable- hours;
7. Consumers who do not want to receive alerts must be able to opt-out.
8. The changes apply purely in respect to bills for "consumers", meaning business customers are not affected (Ariba, 2009).

4.4.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	IRELAND
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	There aren't government promoted standards
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	E-mail and document attachments to emails with digital signature, EDI
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	Not yet, still in discussion
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	A taxable person keeping electronic records must retain and store particulars such as details of the form of encryption, electronic signature used, the format in which they are stored and how they can be accessed.
PERCENTAGE OF DIFFUSION	about 1%	between 15% and 40%

TABLE 13 – IRELAND COMPARATIVE CHART

4.4.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 14 the spider diagram that gives a picture of the dimension of the electronic invoicing in Ireland, according to the procedures explained in the research methodology.

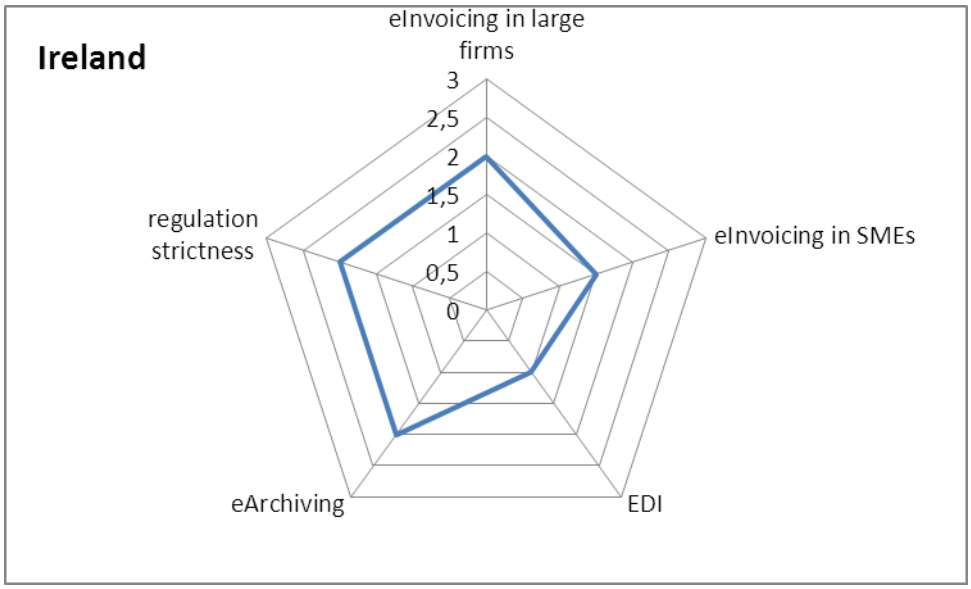


TABLE 14 – IRELAND SPIDER DIAGRAM

- eInvoicing diffusion: between 15% and 40%. More concentrated in the large firms but present also in the small and medium due to the fact that Ireland has a lot of businesses in UK.
- EDI: the law allows the invoice exchange with any methods, EDI it is not so diffused.

- EArchiving: 6 years and it is necessary to keep: books, records and documents relevant to the business, including invoices, credit notes, settlement vouchers and debit notes.
- Regulation strictness: a mix of loose and strict regulation. For example the eInvoice has to be issued within the 15 days following the end of the month during which each payment was received. Other points are more relaxed. For instance there are no strict requirements regarding the format of the invoices (see EDI).

4.5 DENMARK

4.5.1 REGULATORY FRAMEWORK

Today public institutions in Denmark only accept invoices from suppliers in electronic format. The reform was put into force in February 2005. It affects approximately 15 million invoices a year, and applies to the entire public sector, from government ministries to nursery schools.

When placing an order today, the employee states the electronic address of the institution, the EAN number. This ensures that the invoice arrives directly into the electronic invoicing system of the institution, and is subsequently approved online via the employee's pc – a process that takes minutes. The invoice can be called in a matter of seconds for future reference and has to be stored for 5 years after the end of the year in which the taxable acquisition takes place (EInvoicing in Denmark, 2007).

An electronic invoice is a bill converted to a particular format, which can be read directly by the public sector's accounting systems. This particular format is called an

”OIOXML electronic invoice” and is based on international standards (OIOXML is a brand which denotes the Danish use of XML with OIO, Open public Information Online), which has been standardized to ensure smooth information exchange across the public authorities and towards citizens and private businesses (interoperability invoice in Denmark). The infrastructure is made up of a sort of electronic postal service, the VANS network, and an electronic postal address, an EAN number that identifies each public-sector entity

Companies can send their invoices in different ways, according to their level of IT readiness (EInvoicing in Denmark, 2007).

Through an electronic invoicing system, by sending an OIOXML digital invoice directly from their own system to their public-sector customer via the VANS network.

- Through a digital invoice portal, which resembles an Internet bank where companies compose their invoices using a login and password, and then send it electronically.
- By sending a paper invoice with an EAN number to a Read-In bureau. Here it is converted to an electronic invoice and forwarded to the correct public institution. This solution ensures that foreign companies and companies without the necessary IT can still do business with the public sector.

A schema of the eInvoicing process is represented in figure 14.

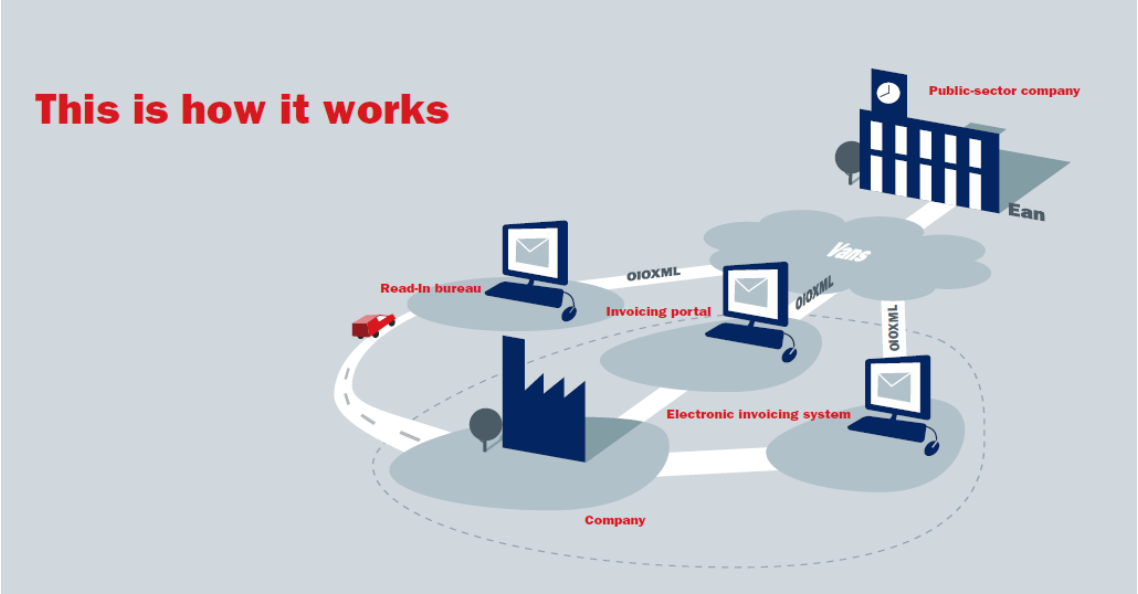


FIGURE 14 - EINVOICING SCHEMA. SOURCE (EINVOICING IN DENMARK,2007)

4.5.2 BASIC INFORMATION REQUIRED

All invoices to public sector customers in Denmark must include the information explained in the following table:

EAN number	Must always be included in the invoice. This information must be received at the latest when the customer places the order.
Order or requisition number	
Personal or other reference	

Internal accounting number	Must be included in the invoice if the customer gives this number when placing the order.

TABLE 15 - EINVOICING REQUIREMENTS IN DENMARK. SOURCE (EINVOICING IN DENMARK 2007)

4.5.3 FOCUS ON: FIRST PEPPOL BETWEEN DENMARK AND SWEDEN

ESV(Swedish Financial Managements Authority) in Sweden has March 2, 2011 successfully received its first PEPPOL BIS invoice from Alfa1lab in Denmark. Peppol (Pan-European Public Procurement Online) project is a tangible example where the EU is attempting, among other things, to create interoperability between the electronic solutions for procurement for different countries. The thought is that companies should be able to retain their existing solution for sending and receiving eInvoices while at the same time also being able to use cross-border eInvoicing within the EU. The overall vision behind Peppol is that all companies within the EU, both small and large, must be able to exchange data electronically with public stakeholders in the entire EU during the entire procurement process, of which the invoice comprises a part. The goal is to increase the use of e-commerce across borders, and Peppol will be offering technology to link national solutions together (Thorkild B Westergaard,2011). In autumn 2009, the Swedish government decided that Sweden would participate in Peppol and that the Swedish central administrative agency under the Ministry of Financeis (ESV) should be the authority responsible for coordinating the Swedish

participation. Sweden has chosen to participate in that part of the work that involves eInvoices. The purpose of the Swedish participation is, among other things, to increase the use of eInvoices. The long-term goals for the Swedish participation in Peppol is to:

- create good preconditions for cross-border trade with the support of electronic commerce – both for the public sector and for companies that supply goods and services across national borders

- increase the public sector's use of eInvoicing and other e-commerce through solutions that are produced in the project in co-operation with solutions that already exist in Sweden.

The project is broken down into sub-projects that all address different parts of the purchasing process. The goal of the work in this group that is involved with eInvoices is to bring about a European eInvoice framework that enables small and medium-sized companies to use eInvoices in an efficient manner in order to reduce their start-up and operating costs for eInvoices.

Alfa1lab issued the invoice in the CENBII/PEPPOL format. It was sent, received and acknowledged in accordance to the PEPPOL messaging infrastructure. The invoice was then imported into the eInvoice workflow in Agresso at ESV where it was assessed, approved and paid. (First PEPPOL eInvoice sent from Denmark and received in Sweden | EEI Platform) (Thorkild B Westergaard, 2011).

4.5.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	DENMARK
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	OIOUBL and OIOXML, based on XML language
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	EDI, XML, OIOUBL and OIOXML, e-mail and document attachments to emails, business control methods
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	Paper invoicing for trading with the public sector has been abolished since 2005
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	Register the description of the instruments and procedures used.
PERCENTAGE OF DIFFUSION	about 1%	over 40%

TABLE 16 – DENMARK COMPARATIVE CHART

4.5.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 17 the spider diagram that gives a picture of the dimension of the electronic invoicing in Denmark, according to the procedures explained in the research methodology.

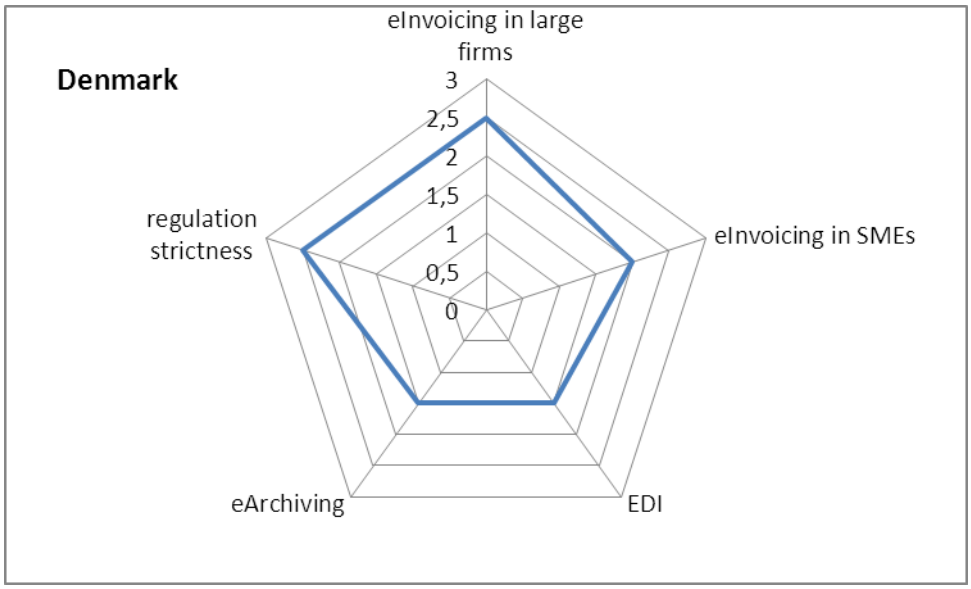


TABLE 17 - DENMARK SPIDER DIAGRAM

- eInvoicing diffusion: over the 40% of the invoices is electronic, with high relevance in the SMEs. A factor that affects this tendency is the compulsory eInvoicing towards the Public Administration since 2005.

- EDI: not so diffused. The most used format are OIOUBL OIOXML that are typical Danish standards based on XML language.

- EArchiving: 5 years, that is a short period compared to the other countries. In Denmark there is the requirement of registering the description of the instruments and procedures used. This normative lowers the value in the diagram.

- Regulation strictness: diverse compulsory requirements are requested like the EAN number, to be sure that the invoice arrives directly to the receiver. The value on the diagram isn't the highest because a uniform use of the OIOXML allows the internal interoperability.

4.6 POLAND

4.6.1 REGULATORY FRAMEWORK

Electronic invoicing in Poland is still rather uncommon practice. Poland's Minister of Finance issued a new regulation concerning the storage and tax authorities' access to electronic invoices. With the new guidance, businesses can send eInvoices in any electronic format that allows for authenticity of origin and integrity of content. Now it is possible also through pdf, and not only through EDI or qualified electronic signature (www.eInvoice-gateway.net).

When the EDI is concerned, the biggest market for the EDI invoices are FMCG (fast moving consumer goods) sales chains with supermarkets located on the top and being actually the originator for the electronic data interchange.

An important legal act is the Executive Regulation issued by the Minister of Finance on the 14th of July 2005 on issuing and sending of eInvoices, as well as on storing and making them available for Tax Office or Tax Inspection (Official Journal 2005 No. 133, item 1119) transposing the key provisions of the Council Directive 2001/115/EC of 20 December 2001 amending the Directive 77/388/EEC with a view to simplifying, modernizing and harmonizing the conditions laid down for invoicing in respect of value added tax and being now a part of the Council Directive 2006/112/EC of 28 November

2006 on the common system of value added tax. The Executive Regulation on issuing and sending of eInvoices, as well as on storing and making them available for Tax Office or Tax Inspection regulates (www.eur-lex.europa.eu):

1. means and conditions of issuing and transmitting the invoices in electronic form
2. rules on storing and making the invoices being transmitted in electronic form available for Tax Office or Tax Inspection.

Remaining issues concerning the sending of invoices whether in electronic or paper based form are included in the VAT act of 11th of April 2004 (Official Journal 2004 No. 54, item 535, amended) and in the Executive Regulation issued by the Minister of Finance on the 28h of November 2008 (Official Journal 2008 No. 212, item 1337). The provisions concerning the invoices obligatory storing time periods result also from the General Tax Law of 29 August 1997 (Official Journal 2005 No. 8, item 60, amended).

4.6.2 BASIC INFORMATION REQUIRED

The Executive Regulation issued by the Minister of Finance on the 14th of July 2005 on issuing and sending of eInvoices, as well as on storing and making them available for Tax Office or Tax Inspection regulates the key issues in relation to the eInvoices in Poland: the invoices issued in electronic form shall be transmitted and provided to the addressee of data using electronic equipment for processing (including digital compression) and storage, and employing wire, radio, optical or other electromagnetic means (§ 2 of the Regulation) (www.eInvoice-gateway.net):

- the eInvoice recipient's acceptance for receiving invoices in electronic form has to be stated before issuing any communication(§ 3.1 of the Regulation),

- the eInvoice recipient's acceptance shall be stated in the written form or electronic form. In the latter form the provisions of the § 4 apply (§ 3.2 of the Regulation),

- the eInvoices shall be issued and sent to the receiver no sooner than from the day following the day of the acceptance statement (§ 3.3 of the Regulation),

- in case of the acceptance withdrawal no further electronic invoices shall be issued and sent to the recipient starting from next day following the day of the issuer’s acceptance withdrawal receiving (§ 3.4 of the Regulation) (www.eInvoice-gateway.net),

- adjustment (correcting) invoices and replacement invoices issued to the eInvoices are to be issued and sent in electronic form (§ 5.1 of the Regulation),

- in case formal or technical obstacles occur making it impossible to issue or send an adjustment (correcting) invoice or a replacement invoice these documents in paper form with an annotation that the document refers to an invoice in electronic form (§ 5.2 of the Regulation),

- invoices sent or made available in electronic form are to be stored in the territory of Poland provided that the instant, full and on-line electronic access to the eInvoices is guaranteed on demand of the Tax Office and Tax Inspection Authorities and correspondingly to other applicable legal provisions. In particular the access and usage of the eInvoices by the before mentioned Authorities shall be documented, especially by the means of printing and providing the eInvoices legible, with respect to the paragraph 6.2 of the Regulation (§ 6.1 of the Regulation),

- provided the electronic invoices are to be stored outside the territory of Poland, Head of the Tax Office and Head of the Tax Inspection (responsible for the excise tax in respect of the corresponding taxpayer) shall be informed in writing about the place of the eInvoices storage - the address and provided the address does not refer to the issuer or recipient, also about the name of the entity responsible for eInvoices storing (§ 6.2 of the Regulation) (www.eInvoice-gateway.net),

- the before mentioned notification obligation does not refer to the entities not being taxpayers (§ 6.3 of the Regulation),

- provided the electronic invoices are to be stored outside the territory of Poland and the storage place changes, Head of the Tax Office and Head of the Tax Inspection (responsible for the excise tax in respect of the corresponding

taxpayer) shall be informed in writing about the place of the eInvoices storage (the address and provided the address does not refer to the issuer or recipient, also about the name of the entity responsible for eInvoices storing) not later than after 7 days after the change taking place (§ 6.4 of the Regulation),

- the invoices sent in electronic form shall be stored by the issuer and by the recipient in electronic form in original form in which they were sent in a way that the authenticity of the origin of the invoices and the integrity of their content, as well their legibility is provided (§ 6.5 of the Regulation).
  in May 2010, Poland's Supreme Administrative Court held that it was allowed to send an invoice as an attachment in an email. This eInvoice even after being printed by the receiver, could be treated as a paper invoice, allowing for VAT deduction (eeiplatform.com)

To send invoices electronically, two conditions must be satisfied:

- Authenticity of origin—certainty that the identity of the person supplying the goods or service, is the issuer of the invoice
- Integrity of content—invoice data has not been altered

4.6.3 FOCUS ON: DISCREPANCY IN ICT COMMUNICATION

An important study has been made in the area Silesian region, the most populated and industrialized of Poland. In particular has been made a survey of 430,578 registered business entities (404,813 micro companies, 21,528 small companies, 3,623 medium,

and 614 large) in the area of ICT communication and cooperation with business partners. It can be noticed that most of problems in this field are solved by using the Internet that is primarily used for searching for business partners and conducting negotiations (61.9%), sending and receiving offers (78.6%), ordering (64.2%), receipt of orders (63.1%), issuing invoices (17.7%), receiving in-voices (21.7% indications), settlement of payables (67.5%), settlement of receivables (67.3%), the exchange of experience and knowledge (44.9%). The exception here is the issuing and receiving of invoices, as most businesses still prefer paper versions but for their preparation they use computer software.

This discrepancy (see figure 12) leads to a missing opportunity that an important country like Poland can't discard in order to emerge (Katowice, Poland, 2010)

Specification	The issue does not concern my company	The company uses the Internet	The company uses		The company is not capable of dealing with the issue
			paper and pencil	computer and software	
Searching for business partners and negotiations	20.0	61.9	14.2	2.6	1.3
Sending and receiving offers	9.4	78.6	5.7	6.3	0.0
Ordering	13.2	64.2	12.6	10.1	0.0
Receipt of orders	13.4	63.1	14.0	9.6	0.0
Issuing invoices	13.3	17.7	20.3	48.7	0.0
Receiving invoices	14.6	21.7	36.3	27.4	0.0
Settlement of payables	12.1	67.5	10.8	7.6	1.9
Settlement of receivables	10.1	67.3	13.2	8.2	1.3
The exchange of experience and knowledge	21.2	44.9	23.1	9.6	1.3

FIGURE 12 - THE USE OF ICT (% OF THE COMPANIES SAMPLED). SOURCE (UNIVERSITY OF ECONOMICS, KATOWICE, POLAND, 2010)

4.6.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	POLAND
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	There aren't government promoted standards
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	E-mail and document attachments to emails with digital signature, EDI
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	No
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	Keep all documents relating to the calculation of VAT until the tax obligation is prescribed
PERCENTAGE OF DIFFUSION	about 1%	under 10%

TABLE 18 - POLAND COMPARATIVE CHART

4.6.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 19 the spider diagram that gives a picture of the dimension of the electronic invoicing in Poland, according to the procedures explained in the research methodology.

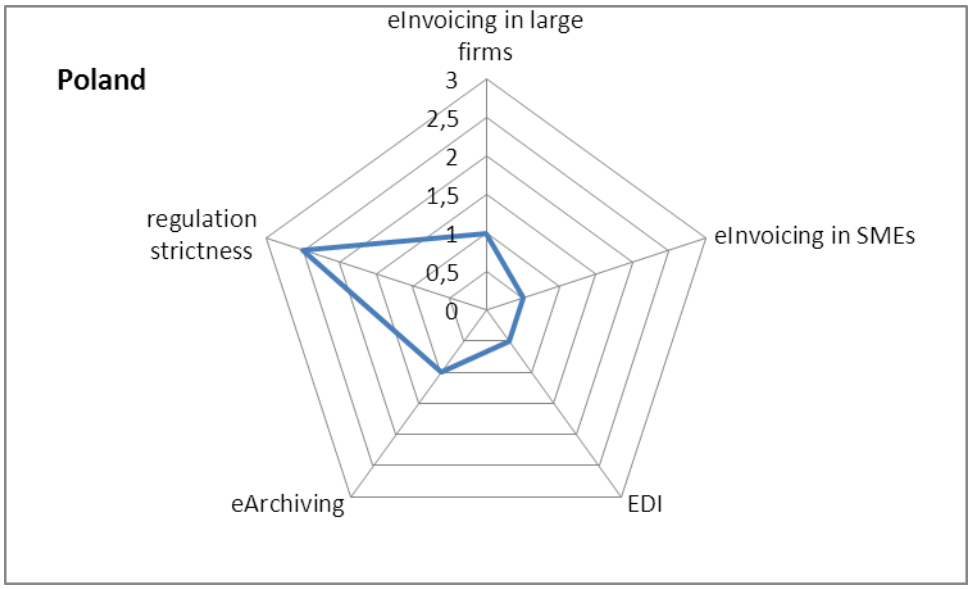


TABLE 19 - POLAND SPIDER DIAGRAM

- eInvoice diffusion: less than 15% of the invoices is electronic. It is an uncommon practice and the paper is still preferred.
- EDI: not diffused. The large enterprises partially adopt it.
- EArchiving: 5 years with a strict regulation
- Regulation strictness: the government doesn't promote the eInvoice and, moreover are not accepted the business control methods.

4.7 FINLAND

4.7.1 REGULATORY FRAMEWORK

Finland is one of the definite leaders in the World of electronic invoicing that is a diffused practice and the government made it mandatory towards the Public Administration since 2010. The final aim of Finland is the development of a common standard (www.tieke.fi). This is hard to be done also due to the slow international standardization. The model and the actors involved are represented in the figure below.

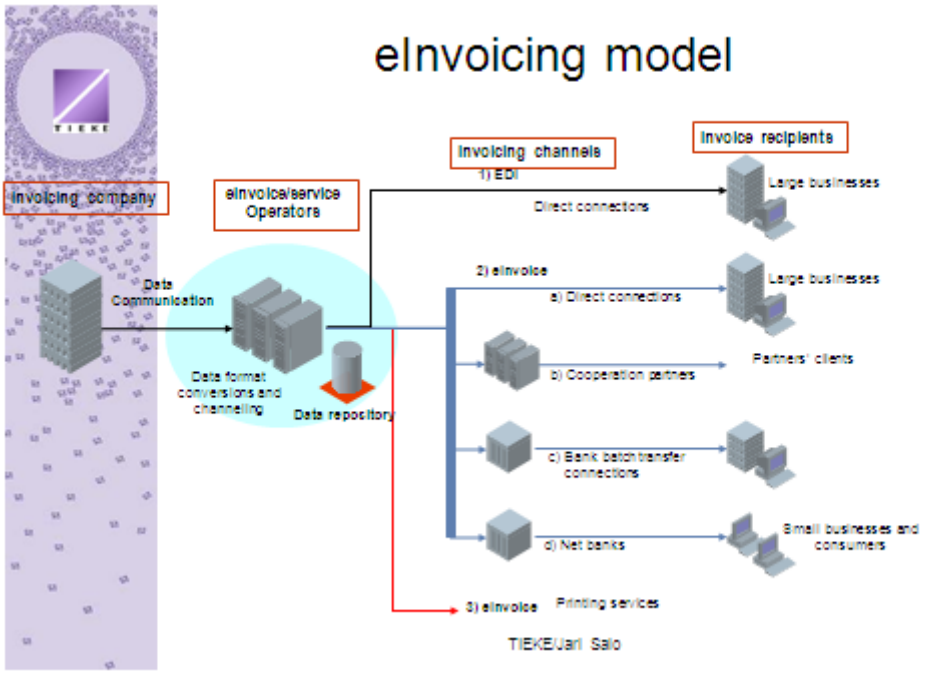


FIGURE 13 – EINVOICING MODEL. SOURCE (JARI SALO, 2005)

The eInvoicing activities in Finland concentrate around the Finnish eInvoice Forum. The main goal of the eInvoice Forum is to promote the widespread adoption and use of

electronic invoicing based on common standards and procedures. A further goal is to support inter- and intra-organizational collaboration among all parties in the field.

TIEKE Finnish Information Society Development Centre, co-ordinates the eInvoice Forum. The Forum is a central collaboration and meeting point for the different parties in the field, such as developers, service providers, experts and the users of electronic invoicing.

In Finnish eInvoicing environment operators and banks are equally providing eInvoicing services for business and public sector. The banks and eInvoicing service providers have agreed upon basic procedures that enable eInvoices to be sent and received reliably in a common trunk network. This means that the eInvoicing traffic between the invoice issuer and invoice recipient is conveyed in a uniform manner even if the parties use the services of different eInvoicing providers.

The eInvoicing service providers and the banks take care of the set-up, maintenance, monitoring and backups for the network connections. They also handle any format conversions needed for eInvoices, allowing customers to select the method of sending and receiving eInvoices that suits them best (www.eInvoice-gateway.net).

The government banned from 01/01/2010 the paper invoices and the legislation in Scandinavia imposes no hindrances on electronic invoicing. As a transmitter of electronic invoices, the eInvoicing service provider corresponds to the Post Office so eInvoicing data enjoys the same privacy and protection as conventional mail. The Accounting Act in Nordic countries permits the use of electronic archives for both vouchers and accounts ledgers. Many Nordic companies already use electronic

archiveing. In order to promote the diffusion of the practice, the government promotes the use of FInvoice that is a particular standard based on XML language that allows to do not have problem with different languages of communication and achieve the country interoperability.

4.7.2 BASIC INFORMATION REQUIRED

The identification is done by Business Identity Code (Business ID) which is a code:

- given to businesses and corporations by the authorities,

- a VAT liable business can form a VAT number of its Business ID 1234567-8 b adding a two-character country code 'FI',

- the national VAT legislation not include the requirement of electronic invoices, it states that there is no need to set any specific requirements for electronic invoicing in Finland. There has not been any taxation problems in electronic invoicing. Although encouraging technical security in electronic invoicing is a good goal, legislation should not include mandatory requirements that are too strict,

- there is the same security level of a normal e-mail (European Commission, 2010).

- For what concern the invoices archiving they have to be retained for 6 years from the end of the calendar year during which the financial year (to which the invoices relate) has ended.

4.7.3 FOCUS ON: FINVOICE IN BANKS

The collective bank model is based on Finvoice which is an eInvoice for electronic/online presentment by the invoice issuer to the receiver. Finnish banks originally designed it as invoice in machine readable form (XML) enclosed in an electronic envelope to replace the traditional paper invoice. Finvoice can be sent to receivers through banks‘ online invoice transmission service or by using another invoice service provider. It is a solution suitable for invoicing between businesses of any size, also for invoicing to consumer customers. The Finvoice format is also used in solutions for invoice financing. In 2009 banks have 129,000 agreements with corporates for using Finvoice and the eInvoice volume in the banks‘ network has increased by 60%. Banks‘ eInvoice volume was over 8 million (Innopay, 2010).

4.7.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	FINLAND
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	Finvoice: an XML schema often used by local Finnish banks
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature,EDI, XML, business control methods, certified electronic e-mail (CEM)	EDI, XML, Finvoice, e-mail and document attachments to emails, business control methods
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	Since January 2010, the Government has only accepted e-invoices
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	There are no particular requirements.
PERCENTAGE OF DIFFUSION	about 1%	over 40%

TABLE 20 – FINLAND COMPARATIVE CHART

4.7.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 21 the spider diagram that gives a picture of the dimension of the electronic invoicing in Poland, according to the procedures explained in the research methodology.

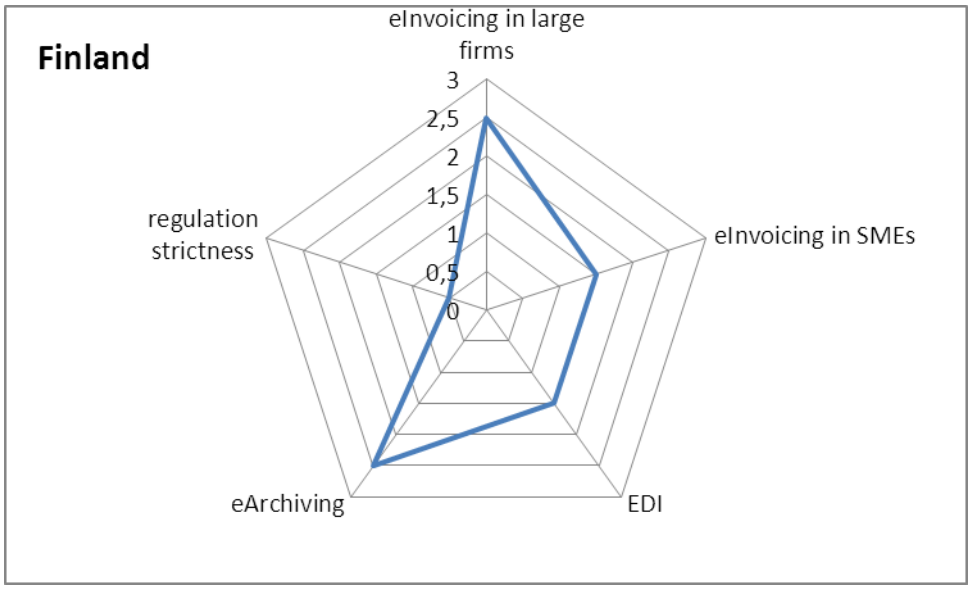


TABLE 21 - FINLAND SPIDER DIAGRAM

- eInvoice diffusion: over the 40 % of invoices are electronic with a great diffusion in the large firms as in the SMEs with a coverage of about the 40%(Eurostat, 2011 file del SMEs diffusion).

- EDI: quite diffused but, as in Denmark, is preferred the XML format used for the Finvoice, a typical Finnish standard.

- EArchiving: 6 years. The invoices can be archived in any format if it respects the normative parameters.

- Regulation strictness: loose regulation. The standard to be used can be any if it respects the requirements of authenticity, integrity and readability of the data. The government promote eInvoicing with the “Finnish eInvoice forum” with the scope of diffusing the practice.

4.8 GERMANY

4.8.1 REGULATORY FRAMEWORK

Electronic invoicing in Germany is a mature practice with a higher penetration with respect to Italy (Italy<15%, Germany 15%-40%) (Billentis, 2013) and a high discrepancy according to the sector and to the firm size: more present in the engineering industry and in large enterprises.

Germany is the EDI leader in Europe and, if the communication is done in this way, a taxable person doesn’t have to take particular precautious methods to respect the principles of integrity and authenticity during the storage period because the principles are guaranteed by the technology itself.

With the annual taxation law for 2009 – „Steuerbürokratieabbaugesetz“– the German legislation allows for electronic invoices transmitted via electronic data interchange (EDI) without the obligation to use digital signatures to ensure authenticity and integrity of the data (www.linguee.de).

Pre-conditions for using EDI are:

- The existence of an agreement to use EDI between the involved partners;
- Reliable, documented and auditable internal processes, which ensure the generation of correct messages using electronic data processing (EDP) systems.

The used processes and procedures must ensure that unauthorized people cannot, neither deliberately nor accidentally, change the data.

- The application of a means of transmission, which ensures authenticity and integrity of the data;

- A data exchange format, which is able to transmit all necessary data with respect to commercial and taxation legislation and to the business requirements („Global INVOICE Implementation Guideline")

Talking about the e-archiving in Germany there aren't specific restrictions, so the general rules of the German Fiscal Code, Section 147 are extended to all type of invoices. In Germany is required to keep incoming invoices and copies of outgoing invoices for 10 years from the end of the calendar year in which the invoice was issued. The eArchiving is not efficient due to the lack of specific rules of it, only applies the principles of data access and auditing of digital, meaning that copies must be readily accessible and exact copies of incoming invoices and reproductions of outgoing invoices must be maintained (http://rechnungsmail.de/).

4.8.2 BASIC INFORMATION REQUIRED

Germany plans to simplify eInvoicing requirements maintaining the authenticity and integrity of the content abandoning the sales tax approval of electronic invoices.

Therefore, there will be no technical requirements anymore that need to be met by a German company. The remaining requirements are (www.eInvoice-gateway):

- determine the way to ensure the authenticity of the origin, the integrity of the content and the legibility of the invoice. This may be achieved by any business controls which create a reliable audit trail between an invoice and a supply of goods or services.

- Archive and keep the invoice for 10 years.
- invoices can be in any language so long as they are not encrypted and are machine readable.
- Payment amounts on eInvoices in Germany can be in any currency. The conversion of any foreign currency into Euros must follow a specific procedure regulated by the Federal Ministry of Finance.
- The condition of acceptance of eInvoices in Germany is different from Italy. In Italy there is a tacit agreement for the invoices that born and remain electronic for their full life-cycle and an informal agreement is needed for the invoices that born paper based and are turn into electronic. In Germany, is enough to post the enterprise's e-mail address on business letters and do not reject the invoices received (signamus.de/en)

4.8.3 A FOCUS ON: ELECTRONIC DOCUMENT MANAGEMENT

This example is based on a study by E-Finance Lab, a joint institution that is ran by the university of Frankfurt and Darmstadt. It has been made a survey of the 1000's largest

companies (banks excluded) in Germany, to determine their estimation of the potential benefits coming from the optimization of sub processes in financial chain management (efinance lab):

- 26% (which was the largest share) views eInvoicing as offering the greatest potential.

- As far as invoice volume is concerned, the survey revealed an average of 68000 invoices per month with a wide bandwidth of up to 2 million invoices per month.

- More the 2/3 of all invoices are still being sent through the postal system.

- An invoice sent out through the postal system costs an average of 16,6 € compared to 2,00 € for the standardized electronic exchange of data.
- The electronic management of documents decreases the number of errors. The processing of a compliant, for instance, costs on average of 1,28 €

The following figure confirmed, in addition to the literature, the basic validity of the cost assessment beyond the economic segment of large corporations.

FIGURE 14 – POTENTIAL SAVINGS – SOURCE (EFINANCE LAB)

4.8.4 COMPARATIVE CHART

The following chart has been built In order to highlight the similarities and differences of the countries with respected to Italy.

	ITALY	GERMANY
COUNTRY PARTICULAR STANDARDS	The standard used for the eInvoicing towards Public Administration (FatturaPA).	There aren't government promoted standards
ALLOWED COMMUNICATION METHODS	E-mail and document attachments to emails with digital signature, EDI, XML, business control methods, certified electronic e-mail (CEM)	E-mail, document attachments to emails,EDI, XML, busines scontrol methods
COUNCILE DIRECTIVE 2010/45/eu ADOPTED	Yes	Yes
MANDATORY eInvoicing TOWARDS PA	Not yet, from June 2014	No
MAIN eArchiving REQUIREMENTS	eInvoices must be stored within 15 days of their transmission or receipt. The time stamping put by a third party and the digital signature are required for the substitute archiving	Electronic invoices must be visible and it must be assured that content can`t be changed for a period of 10 years
PERCENTAGE OF DIFFUSION	about 1%	between 15% and 40%

TABLE 22 – GERMANY COMPARATIVE CHART

4.8.5.1 DIRECT INTERVIEW : Stefan Engel-Flechsig

Stefan Engel-Flechsig is an expert of the topic as a member of the European Commission on electronic invoicing. Ha has made a lot of publications and has many years of experience in the field. In this case the interview has been done sending in advance a selected number of questions to Stefan who answered through a written conversation via Skype.

Is there any communication or fulfilment to do when you make an electronic invoice?

It is not mandatory; nevertheless companies prefer to inform about shifting to electronic invoicing.

Which are the constraints and the fulfilments to accomplish when you make an electronic invoice " on behalf „ ?

There is no legal requirement, you can tie in the service provider by any contractual service provider agreement. If the service provider is acting on behalf there must be an authorization by the sending/receiving company to act „sent/received on behalf" and on the invoice this is clearly expressed as such.

Which are the most used methods to guarantee the authenticity of a document? (please make difference between big and SMEs)

In all companies (big/SME) authenticity is controlled by matching invoice and order and additional supplier data. This is in all cases built in ERP systems.

Is there any difference between the treatment (archiving, admissibility of outsourcing the process and the archiving, requirements..) of an electronic invoice and the other fiscal

documents (purchase order, delivery note, journal, inventory book, purchase book, sales book)?

From a legal perspective there is a clear separation between taxation and general bookkeeping rules from various specific areas. In some aspects there are potential conflicts (e.g. location of archived business documents), but in most areas they try to be synchronized as much as possible.

Are the time stamping and the different types of electronic signature mandatory?

No – they can be used as example technologies for business controls, or they can be used in addition to other established business controls.

Which are the main normative criticalities of the EDI?

You need to have an EDI agreement in place before starting exchanging EDI.

4.8.5.2 DIRECT INTERVIEW : Marcus Laube

Marcus Laube is the Vice President of the German eInvoicing alliance VeR and member of the board of the European Alliance EESPA.

Also in this case the interview has been done sending in advance a selected number of questions and Marcus replied through a written conversation via e-mail.

ELECTRONIC INVOICING

Which are the modalities of the agreement with suppliers?

No specific agreement with suppliers required. Invoice recipients should accept to receive electronic invoices from suppliers.

Which are the constraints and warranties requested by the normative?

The normative is new and not so known.

Do guidelines exist in terms of authenticity requirements? Are respected?

No official guidelines. The official term used by authorities “internal business controls” is not specified. Common sense is to use a specific documentation about the process for incoming invoices (Verfahrensdokumentation).

Is it possible to store electronic invoices on paper?

No, electronic invoices have to be stored electronically.

EDI

Is it mandatory the use of the summary invoice when a document is sent through EDI? If it is, please provide some details ion terms of content and archive modalities.

Since 2009 this is no longer required

ELECTRONIC ARCHIVING

Which are the principles of a proper bookkeeping in terms of e-archiving?

For a term of 10 years electronic invoices must be visible and it must be assured that content can`t be changed. This can be realized by means of hardware, software or processes.

OTHER FISCAL DOCUMENTS

Is it possible to store other fiscal documents (Purchase Order, Dispatch Advice or Delivery note, Journal, Warehouse book, Inventory book) on paper?

Yes

Which are the main normative criticalities?

No answer

Which are the warranties required?

No answer

4.8.5.3 DIRECT INTERVIEW: Seeburger expert

ELECTRONIC INVOICING

1 Is the definition of EInvoice the same of the one included in the Directive 2010/45/UE, so *"electronic invoice" means an invoice that contains the information required in this Directive, and which has been issued and received in any electronic format. "* ?

- Yes, it is for all countries of the EU and might be different in other countries outside the EU.

- As Directive 2010/45/UE intends to ease the eInvoicing within the EU still legal requirements on invoices for VAT deductions need to be considered in addition to the EU directive.

2 Is there any condition to set between the supplier and the customer, included in the normative, before the issuing of an eInvoice?

a. In general Article 232 applies to all eInvoices: ”Article 232: “The use of an electronic invoice shall be subject to acceptance by the recipient.” The way the countries handle this requirement in the eInvoicing practice differs slightly from country to country:

i. In Germany the acceptance of the recipient can be assumed as granted when firstly the customer posts his e-mail address on business letters, and secondly when he does not reject invoices received from suppliers via e-mail due to the fact that these have been sent to the customer via e-mail.

ii. In Italy all parties must sign a written agreement, stating the eInvoice exchange process is fully compliant to the law. If a third party takes part (such as a VAN provider), they have to sign the written agreement as well.

iii. In Spain the invoice recipient must agree to receive an eInvoice before it is sent, by any means, in oral or written form.

iv. Etc.

b. When suppliers and customers plan EDI as communication type for eInvoicing they need to agree on an EDI message guideline for eInvoicing.

3 Can I use any transmission channel to issue the eInvoices? Are there particular guarantees to respect? (for instance the compulsory use of encrypted transmissions)

Directive 2010/45/UE states that "…taxable persons should not be required to use any particular electronic-invoicing technology."

That means basically any electronic format or channel could be used to exchange eInvoices.

4 Before the adoption of eInvoicing, is it necessary to communicate something to a particular Public Authority?

Not within EU.

5 Are the eInvoicing "on- behalf" and the "self-billing" admitted procedures? is there any particular constraint or communication mechanism to be respected? Does the normative require to draw up a deal with the provider ("on-behalf") or with the client ("self-billing")?

Article 224

Invoices may be drawn up by the customer in respect of the supply to him, by a taxable person, of goods or services, **where there is a prior agreement between the two parties and provided that a procedure exists for the acceptance of each invoice** by the taxable person supplying the goods or services. Member State may require that such invoices be issued in the name and on behalf of the taxable person.

6 Which kind of electronic signature is allowed and which one is the most used in your country (electronic signature (ES), advanced electronic signature (AdES), qualified electronic signature (QES), digital signature (QES with asymmetric encryption)?

Digital signatures are not required anymore in Germany for eInvoicing.

If a digital signature is going to be used to prove integrity and authenticity on an eInvoice can be for instance of the following type:

- A SigG-compliant Qualified Electronic Signature is an example.
- 2048-bit RSA-keys are required.
- The hash algorithm must be SHA2.

Certificates and Certification Authorities (CA): Bundesnetzagentur-accredited CA. EU qualified certificates must legally be recognized but foreign-language certificates as well as certificates issued by foreign CAs that are not accredited and that do not benefit from other official approval or listing may present audit challenges.

7 Is it necessary the use of the time stamping?

No explicit requirements.

ELECTRONIC ARCHIVING

8 Is it possible in your country store on paper the EInvoices issued or received?

No. eInvoices need to be archived electronically. They must be stored in such a way as to guarantee their integrity, authenticity and availability during the storage period.

9 Is it possible to store only in electronic format the other fiscal documents like purchase order, delivery note, journal, inventory book, purchase book, sales book? If it is possible, which are the guarantees requested by the normative regarding the E-Archiving? (for instance if it is requested a particular format, if the files should have a time stamping, if the servers should have particular certifications…)

Invoices: Storage period are 10 years from end of calendar year during which booking was made.

10 Is it possible to store the fiscal documents that were originally on paper only in digital format? If it is possible, the paper documents can be eliminated?

Invoices: Yes, paper invoices can be scanned and stored digitally. Yes, after digital archiving, paper invoices can be disposed.

11 Is it possible to use the “cloud archiving” (both for EInvoices and for the other fiscal documents)? Is it possible to store the fiscal documents in an encrypted form? Is it possible to store them also in other countries (EU and non-EU countries)?

Invoices:

- Invoices must be stored in such a way as to guarantee their integrity, authenticity and availability during the storage period.
- Storage abroad allowed in EU, subject to online access and notification, and outside EU subject to prior approval from the tax authorities.
- Even outsourcing is allowed.

12 Which are the main normative criticalities for the electronic archiving?

- HGB §257
- AO §146 Abs. 5 , §147 including GoBS and GDPdU
- § 14b UStG

EDI

13 Is there any requirement for the firms which issue or receive EInvoices (for instance: print summary statements of the data)?

- See: 94/820/EC: Commission Recommendation of 19 October 1994 relating to the legal aspects of electronic data interchange (Text with EEA relevance).

- Summary invoices on paper are neither required nor permitted in Germany.

14 How the electronic archiving works in the case of EDI invoices (both received and issued)? A firm has to keep the flow (issued or received) or are stored the PDF produced joining the EDI? Is it possible to keep the EInvoices in XML format? How is guaranteed the legibility in this cases?

Outbound Invoices:

- Invoices do not need to be stored in such a way as to guarantee their integrity, authenticity and availability during the storage period.
- They need to be reproducible during the storage period.

Inbound Invoices:

- Invoices must be stored in such a way as to guarantee their integrity, authenticity and availability during the storage period.
- Herby retrospective auditing from a posted and paid invoice back to the original EDI message needs to be possible.
- The original EDI invoice with other evidence of integrity and authenticity as appropriate, ideally a human-readable invoice image and all conversion rules and logs need to be archived (all intermediate formats between the ERP system and the original invoice need to be archived).
- A human human-readable invoice image is not required to be archived. Instead a EDI viewer could be used. But for convenience and security it

is recommended to store a human-readable invoice image at the point of invoice receipt rather than storing the viewer logic at the point of invoice receipt (can be difficult when viewer does not remain supported by provider over the entire storage period)

- Storage abroad allowed in EU, subject to online access and notification, and outside EU subject to prior approval from the tax authorities.
- Even outsourcing is allowed.

15 The Edi processes follow the COMMISSION RECOMMENDATION of 19 October 1994 relating to the legal aspects of electronic data interchange?

Yes

16 Which are the main normative criticalities, regarding the EDI and the EInvoices, included in the normative?

No answer

DEVELOPMENT POLICIES

17 According to you, what is the adoption level of EInvoicing in your country?

Mature

18 In which percentage (if not available, I bag for a rough idea) the EInvoicing is present in the small-medium enterprises of your country and in the large ones?

Avg: 15%-40% rate of eInvoicing penetration

- Some industries have higher penetration: automotive, logistics, trading & wholesale, energy
- Other industries e.g. financial services, healthcare, public services have lower penetration

19 What is the level of EInvoicing in your country compared to the rest or the World (or Europe)?

- Scandinavia has usually higher eInvoicing penetration rates than Germany. Here we see decreasing growth rates due to the relatively high market penetration and maturity of the eInvoicing.
- Southern Europe, Eastern Europe has usually lower eInvoicing penetration rates than Germany. Here we see increasing growth rates due to EU Directive 2010/45/UE.

20 According to you, which kind of actions can be done in order to diffuse the EInvoicing use in your Country and in Europe?

- EU-wide only one open standard e.g. e-mail plus PDF (plus optional XML file) without any digital signature

21 Which are the industries that would take more advantage with the adoption of EInvoicing in your Country?

- This is already happening and increasingly growing within for the past 2 years – especially in previously under-penetrated industries e.g. financial services, healthcare, public services.

4.8.5 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 23 the spider diagram that gives a picture of the dimension of the electronic invoicing in Germany, according to the procedures explained in the research methodology.

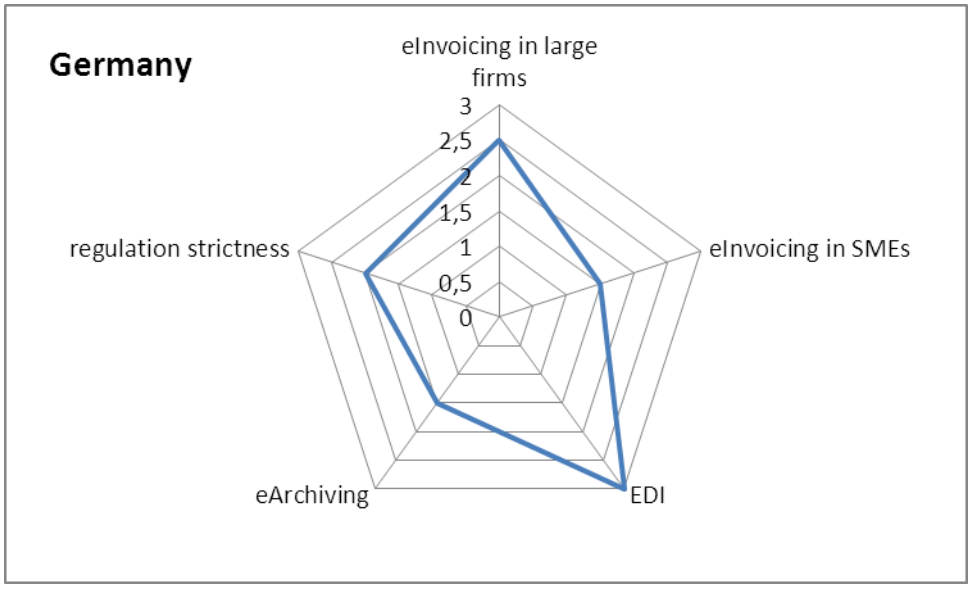


TABLE 23 - GERMANY SPIDER DIAGRAM

- eInvoicing diffusion: diffusion between 15% and 40% mainly in the large enterprises. In the SMEs there is a low adoption level of about 15 % (Eurostat, 2011).

- EDI: used a lot. Germany with UK is the European leader.

- EArchiving: 10 years, that, with Italy, is the highest value in Europe. The law is improving. In fact the government has eliminated the requirement of the invoice summary.

- Regulation strictness: strict regulation even if the government pays attention to the problems of eInvoicing. In fact in 2009, for example, eliminated the requirement of the electronic signature on the EDI documents.

4.9 SUMMARY MATRIX

Thanks to the information coming from the surveys and from the literature it has been possible to fill a summary matrix about all the facets of electronic invoicing. The chart, is focused on Italy, United Kingdom and Germany where the research has gone more into details.

ELECTRONIC INVOICING			
Definition and agreements			
	Italy	**UK**	**Germany**

Definition	Definition of electronic invoicing	Electronic invoices are electronic documents with the aim of guaranteeing the authenticity of the origin and integrity of the data transmitted. (http://www.finanze.gov.it)	Electronic invoicing is the transmission and storage of invoices, without the delivery of paper documents, by electronic means. Electronic equipment is used for the processing (including digital compression) and storage of data.(http://customs.hmrc.gov.uk)	An invoice that is both sent and received electronically. EInvoice is created and sent between two parties system and can be processed automatically. (http://www.fakturaportalen.se)
Agreement with the suppliers	Is the agreement compulsory?	yes	If the transmission is via EDI is required, otherwise it is not	no
	Allowed modalities	Agreement with the receiver	EDI when both have it, otherwise other electronic means	recipients should accept to receive electronic invoices from suppliers.
Duties and communications	Do compliances and agreements exist in order to have an electronic invoice)	yes	No	yes
	Details about compliances and agreements	Agreement among the parties	Only in case of EDI transmission	It is not mandatory; nevertheless companies prefer to inform about shifting to electronic invoicing.

Electronic invoicing "on behalf"	Is it possible to do electronic invoicing "on behalf"	yes	Yes	yes
	Which are the constraints and the guarantees requested by the normative?	Agreement among the parties.	-keeping copies of those agreements -keeping the names, addresses and registration details of your suppliers	No legal requirement
	Which are the duties and communications?	The electronic invoices must be readable and transferable on another IT support	-producing the copy agreements or your suppliers' details for inspection when we ask you to setting up and reviewing self-billing agreements with your suppliers	If the service provider is acting on behalf there must be an authorization by the sending/receiving company to act "sent/received on behalf" and on the invoice this is clearly expressed as such.
Electronic self-billing	Is the agreement mandatory?	yes	Yes	yes
	Which are the constraints and the guarantees requested by the normative?	-the rules to be respected are the Italy's ones (please check the empirical analysis)	- the rules to be respected are the UK's ones(please check the empirical analysis)	-Germany set the rules, but generally no one knows them(please check the empirical analysis)

	Which are the duties and communications?	-Agreement between the parties	-Agreement between the parties -must clearly mark each self-billed invoice you raise with the reference: 'SELF BILLING' -all the details that characterize an invoice	-Suppliers must show their German VAT identification number -valid VAT identification number of the customer
AUTHENTICITY, INTEGRITY AND REDABILITY				
Authenticity and integrity requirements	Which are the methods allowed by the normative?	-electronic signature -EDI is a possible validation input	- electronic signature -EDI is a possible validation input	-electronic signature is no more required -EDI is a possible validation input
	Which are the most used methods?	-digital signature more than EDI because is cheaper	-the only method used is the EDI, which guarantees the authenticity directly through the technology	No official guidelines. The official term used by authorities "internal business controls" is not specified. Common sense is to use a specific documentation about the process for incoming invoices. (Verfahrensdokumentation)
	Which are the less used methods?	-EDI because is expensive	-see previous point	There aren't official guidelines, each firm decides its method
	Which are the most used methods by the SME's	-digital signature	-no one use authenticity requirements because eInvoicing is mainly EDI and these firms don't	There aren't official guidelines

			use it	
	Which are the most used methods by the Multinationals?	-digital signature/ EDI	-EDI, which guarantees the authenticity directly through the technology	There aren't official guidelines
ES, AdES, QES, DS	Which one of the electronic signature is the most used?	Digital signature	No one uses anything	-The authenticity of the origin and the integrity of the content must be guaranteed. Many methods are available, for instance •A SigG-compliant Qualified Electronic Signature
	How many are the CA that issue QES and DS	- banks, public and private organizations(http://www.agid.gov.it/identita-digitali/firme-elettroniche/certificatori-accreditat)	- banks, public and private organizations	- banks, public and private organizations
	Is the time stamping required?	yes	No, but if you want you can do it	No, it's an additional and optional action
"*business controls*"	How is guaranteed the authenticity and the integrity of the data using "*business controls*" methods?	Are organized in order to guarantee authenticity, integrity and legibility	It's the only way used by public agents in order to control the integrity of data	With time stamping or with digital signature for instance
	Are there guidelines that explain the use of this method?	The legislator do not clearly define the principles	No	no

	Are included any guidelines or auditing?	There must be reliable audit between the parties involved	Yes, by the agents in charge of it. The business control methods used depends from company to company. In any case there aren't particular regulations	Yes, by the agents in charge of it. The business control methods used depends from company to company. In any case there aren't particular regulations
	Who uses this method? Why?	The decision is linked to the size of the firm	It is the most diffuse method	It is the most diffuse method
	Who do not uses this method? Why?	The decision is linked to the size of the firm	See previous point	See previous point
Readability warranties	is it possible to archive the electronic invoices in XML format?	-yes	Generally yes. Somebody do not considers the XML format as an electronic invoice	yes
	Which warranties are required in terms of readability if the electronic invoices are stored in XML format?	-the archived format must be static and must be " made legible"	secure environment, using industry-accepted security technologies or other procedural means that offer similar assurances, but not everybody considered it electronic invoicing	Standard format with attachments and a future perspective is a multilingual standard forms or standard forms in Commission's working languages.
	Are required particular certificati	the invoice must be legible.	The invoice must be legible	The invoice must be legible

	ons if is used the "viewer" software?			
CROSS-BORDER ELECTRONIC INVOICING				
Electronic invoices issued to clients foreign-based	What does the normative establishes if the client is in a member state ?	-rules of the member state	-rules of the member state	-rules of the member state
	Regarding Italy, what kind of behavior/ action is suggested to the firms?	Push the governance to relax the normative in order to promote the diffusion		
	What does the normative establishes if the client is not in a member state?	-are applied the rules of the specific country	-are applied the rules of the specific country	-are applied the rules of the specific country
Electronic invoices received by a supplier foreign-based	What does the normative establishes if the electronic invoices are received by suppliers based in another member state?	-rules of the member state	-rules of the member state	-rules of the member state

	Regarding Italy, what kind of behavior/ action is suggested to the firms?	Try to convince the governance to accept the archiving in the issuing country even if it doesn't respect the parameters set by the law.		
	What does the normative establishes if the electronic invoices are received by suppliers based in a non-member state?	-are applied the rules of the specific country	-are applied the rules of the specific country	-are applied the rules of the specific country
EDI				
Duties and communications	Are required communications, before issuing an EDI document?	-recipient consent	-agreement between the parties	The sender of the invoice must document the electronic process that it uses to send the invoice. This documentation must clearly show that the employed process fulfills the legal requirements.
	Are there particular compliances to respect?	-the message must be in accordance with country laws -chronological registration by both parties of the messages	There should be an interchange agreement between the EDI trading partners making provision for the use of procedures that	- A summary invoice was used but since 2009 this is no longer required

			guarantee the authenticity of the origin and integrity of the data but no one do it.	
	Is it mandatory to establish an agreement among the parties involved?	yes	yes	yes
Transmissi on of data	Are included minimum requiremen ts?	-An EDI communication can be considered finished when reach the IT system of the issuer -Verification of the message by the recipient	-syntax checking of data in accordance with the rules of the transmission standard; -use of secure networks; -controls over access to networks	Agreement among the parties involved
	Is the 94/820 respected?	yes	Yes	yes
Ways to store the electronic invoices issued or received through the EDI	is it possible to store the flow based on EDI?	Yes, archive the document for 3 years	Yes	yes
	Is it possible to store the PDF produced joining the EDI received or issued?	yes	Yes	yes
	Main normative criticalities	More control on the messages between the phase of generation and the substitute archiving	There isn't a law to monitor the messages and the can't be cancelled	You need to have an EDI agreement in place before starting exchanging EDI data.

Electronic archiving				
Electronic archiving	Years of archiving required by the normative	10	6	10
	Which are the warranties required?	-all the information requested for standard invoicing -eInvoices must be stored within 15 days of their transmission or receipt -other e-documents within 3 months -nomination of a responsible -the archived format must be static and must be " made legible"	-Must be guaranteed the authenticity and the integrity of the content of the source documents throughout the storage period by electronic or procedural means, and store all the data related to the invoices in a readable format. They must readily be able to recreate the invoice information as at the time of its original transmission, and it must keep history files so that can find the appropriate details from any particular time in the past if they are asked a visiting officer.	-Each document must be unchangeable, available, be displayed and printed again in exactly the same form as it was captured, regained in real time when archived. -The system must offer the capability to the user to guarantee the keeping of the legal regulations (BDSG, HGB/AO etc.) as well as the operational regulations of the user regarding data security and data protection for the life span of the archive.
	Do particular procedures exist for the electronic archiving?	-production of the electronic document -application of the digital signature and time reference -calculation of the hash value -production of the digital evidence -application on the digital document of the electronic signature	- the documents are just stored and the important is that the numbers contained in the documents are correct.	-The procedure used for storing invoices must comply with the principles of proper bookkeeping and in particular For a term of 10 years electronic invoices must be visible and it must be assured that content can`t

				be changed. This can be realized by means of hardware, software or processes.
	Is it possible to outsource the service?	-Always in EU -when the country respects the requirements also outside the EU	-Always in EU -when the country respects the requirements also outside the EU -on-line access to the invoices	-Yes , but in EU
	Is it possible to store the document in servers which are abroad?	-Always in EU -when the country respects the requirements also outside the EU	-Always in EU -when the country respects the requirements also outside the EU	-Traders established in Germany have to keep invoices in Germany or in the areas referred to in Section 1(3) of the Turnover Tax Act. If the traders store it in another country they have to inform the tax authorities where the invoices are stored
	Is the possible the "cloud" storing?	yes	Yes	yes
	Is it possible to store the electronic invoices on paper?	-All the natively electronic documents must be stored electronically	-Generally yes but not the EDI format that has to born and be archived completely electronic.	-All the natively electronic documents must be stored electronically
	Main normative criticalities	Fuzzy normative.	There is no control and the public administration doesn't have the right devices and	No precise guidelines

			equipment to support the process	
Other fiscal documents archiving	Number of years required by the normative	10	6	10
	Which are the warranties required?	Regular formats as an EInvoice	No particular requirements the numbers contained must be coherent.	Authenticity and integrity of contents.
	Procedures of electronic archiving	Normal procedure if the document is natively digital. If it is paper based is necessary to put a digital signature and the time stamping	Like the other documents, there must be the agreement between the trading partners and add a description	Like the other documents, there must be the agreement between the trading partners and add a description
	Is it possible to outsource the service?	yes	Yes, like the other documents	yes
	Is it possible to store the document in servers which are abroad?	-Always in EU -when the country respects the requirements also outside the EU	Yes	Yes, but different location with respect to the electronic invoices
	Is it possible the "cloud" storing?	yes	Yes	yes
	Is it possible to electronically archived documents which are paper	yes	Yes, mainly are paper documents	yes

	based?			
	Main normative criticalities	There are no specific guidelines	No control.	Difficulty in synchronizing the activities with the invoices due to different regulations

TABLE 24 – SUMMARY MATRIX

4.10 EINVOICING OUTSIDE EU

4.10.1 A FOCUS ON CHINA

The Chinese government has not yet allowed electronic invoicing for combined business and tax purposes, it has acknowledged the benefits of using information technologies for tax control. This has led to the creation of the Golden Taxation Project ("Golden Tax System") in 1994. This system is being rolled out gradually. Where the system is in place, its use is mandatory for all VAT-able invoices under Chinese law (Electronic Invoicing in and with China, 2009).

The Golden Tax system is an on-line invoice checking network based on paper invoices. It now links some 4000 tax authorities at and above the county level. It is viewed as a major success since it has significantly decreased tax fraud. Currently the system is in its third rollout phase (see figure 15)

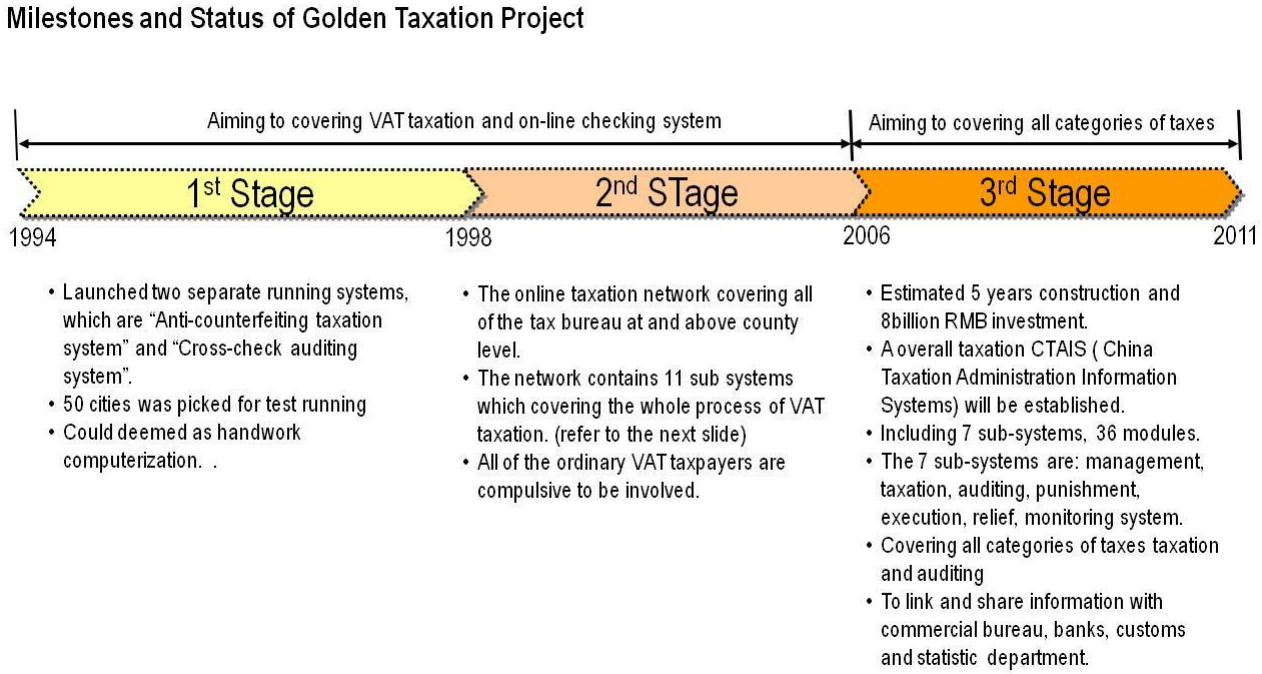


FIGURE 15 - ROLLOUT OF THE GOLDEN TAX SYSTEM. SOURCE (ELECTRONIC INVOICING IN AND WITH CHINA, 2009)

The Golden Tax system includes the concept of a controlled printing system such as a tax-control cash register. There are published standards for such hardware, for instance GB18240.1-2003 for the tax-control cash register (see figure 16).

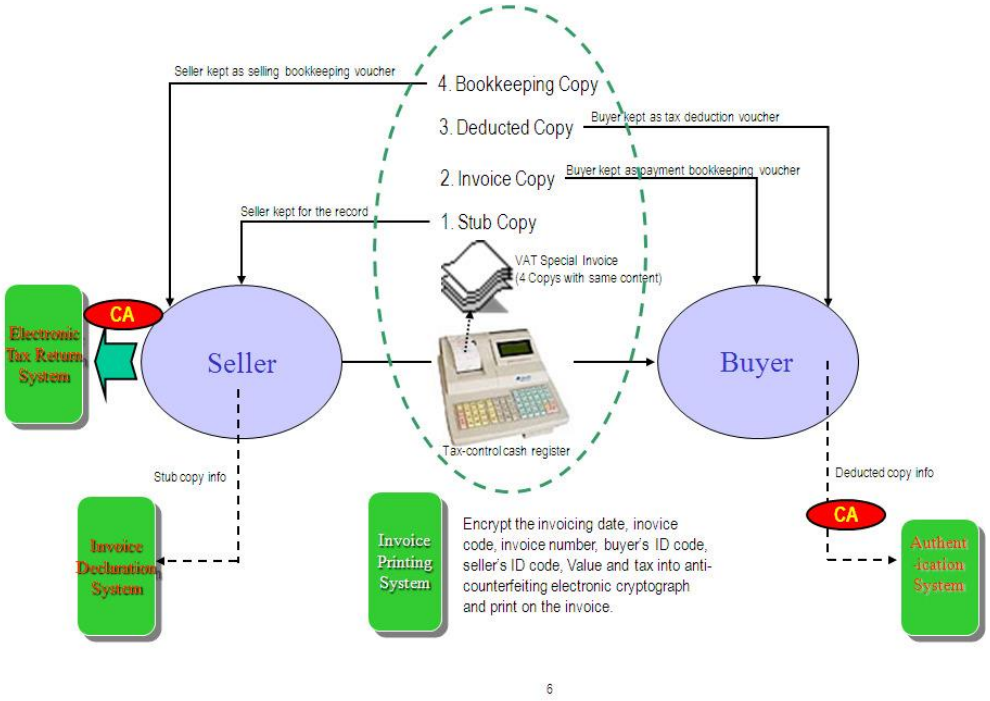


FIGURE 16 - GOLDEN TAX SYSTEM. SOURCE (ELECTRONIC INVOICING IN AND WITH CHINA, 2009)

Companies acting under Chinese VAT law must take measures to issue and receive invoices in compliance with either pre-existing paper-based rules or the Golden Tax System rules. Recent APEC initiatives and a number of conference focusing on interoperability between Chinese and foreign companies' data exchanges show that an evolution towards eInvoice enablement of the Golden Tax System may be considered. It is however unlikely that this will happen until completion of the Golden Tax System rollout (ELECTRONIC INVOICING IN AND WITH CHINA 31 march 2009).

4.10.1.1 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 25 the spider diagram that gives a picture of the dimension of the electronic invoicing in China, according to the procedures explained in the research methodology. In this case the data are main

deduced according to qualitative information.

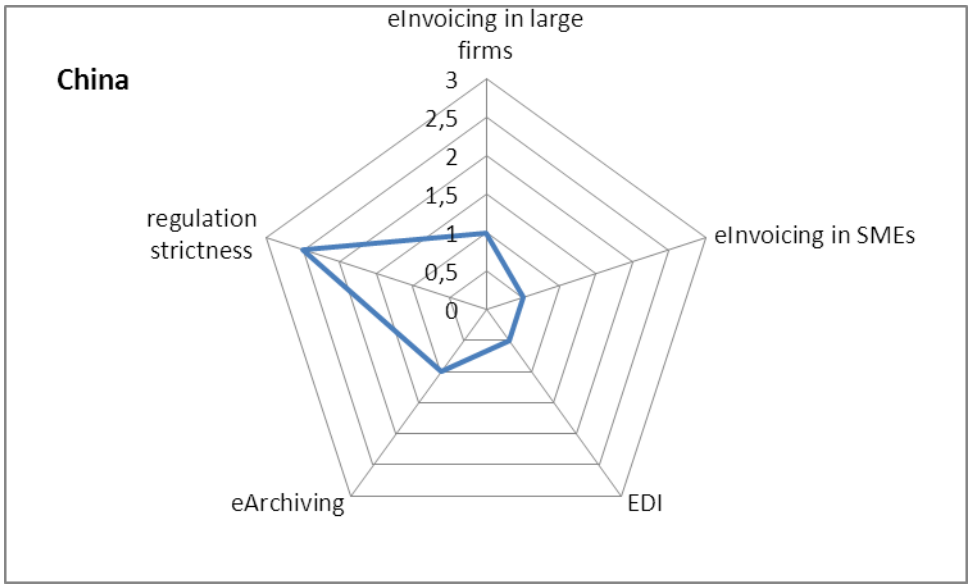


TABLE 25 – CHINA SPIDER DIAGRAM

- eInvoice diffusion: China is a procrastinator country. Do not embraces the "pure" eInvoicing but uses the Golden tax system, a common on-line invoice checking network based on paper invoices.

- EDI: very low diffusion. The standard used is the one of the Golden tax system.

- EArchiving: strict rules belonging to the Golden tax system.

- regulation strictness: very high. The normative is strict but allows interoperability due to the common standard used.

4.10.2 A FOCUS ON ARGENTINA

Argentina is one of the Latin countries that put its method of electronic invoicing into practice.

Based on Government rules and regulations, there are many differences between

eFactura (used in Argentina) and other eInvoicing methods.

The law in Argentina obliges every company that deals with VAT related invoices to generate these documents electronically (eeiplatform.com):

- invoices or equivalent documents,

- credit notes and debit notes.

Companies have the option to create the electronic version of the documents below:

- Invoices or equivalent documents

- Credit notes and debit notes

This fiscal program has started in 2006, and it took the Government a great deal of time and effort to make it mandatory. The number of commercial channels , communication methods and other aspects made the implementation takes a long time.

In order to issue an electronic invoice (eFactura), the companies must request a digital certification called Fiscal Key. Using this fiscal key, the company is an electronic issuer. Then, the company will request authorization to issue each separate invoice. This authorization is requested to AFIP (Administración Federal de Ingresos Públicos), the Government Tax Entity. An electronic certification number called CAE proves that the authorization is official. Without the CAE number

applied to the invoice, it is not possible to release invoices to customers.

This CAE number can be gathered in two ways (eeiplatform.com):

- Normal: the communication method does not matter, every invoice should have one

- Anticipated: the company can ask for a certain number of CAE numbers according to its wish, for 15 days. After this period, the company has to file a report on how many of those numbers were really used. Optionally, they can make a request for more.

Note that the Argentine web services can be quite strict. If the information is not exactly in the way the AFIP expects it, the invoice will fail.

The intent in Argentina is to extend the obligation for E-factura to new sectors in 2014: Almost 350,000 companies are affected by this extension (Billentis, 2014). This action can be a lever to be exploited in order to increase the diffusion of eInvoicing that is pushed by large enterprises, but for the SMEs is still a challenge to exchange invoices electronically (Billentis, 2013) and, as consequence, the diffusion of eArchiving.

Another determining aspect when configuring a company's scenario in eFactura is the regime. A regime determines the tax contribution model that applies to the company. Two major ones are:

- **R.E.C.E.** à Regime de Emissión de Comprobantes Electrónicos – (http://www.afip.gob.ar/fe/#rece) This is the most adequate model for large contributors. It is based on web services, with no limits.

- **R.E.C.L.** à Regime de Emissión de Comprobantes en Línea (http://www.afip.gob.ar/fe/#recl) This model is very adequate for companies with no more than 100 invoices per month (eFactura, the Argentinian Electronic Invoice method).

4.10.2.1 SPIDER DIAGRAM

In order to summarize and visualize the data it is shown in table 26 the spider diagram that gives a picture of the dimension of the electronic invoicing in Argentina, according to the procedures explained in the research methodology.

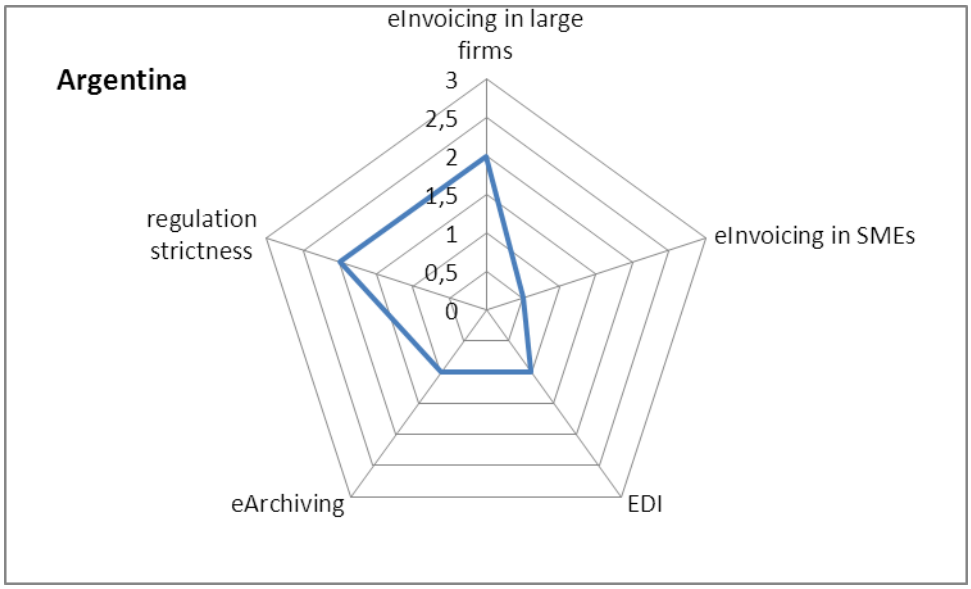


TABLE 26 - ARGENTINA SPIDER DIAGRAM

- eInvoicing diffusion: Argentina has an average diffusion compared to the European situation where the large firms are pushing the adoption but for the SMEs, eInvoicing is still a challenge

- EDI: deduced value due to the fact that PDF and XML standard are the most used. (http://spendmatters.com/2014/02/25/latin-america-eInvoicing-2014-update-argentina-efactura/)

- EArchiving: strict rules belonging to eFactura system

- regulation strictness: high. If the invoice is not in the exact format it will fail.

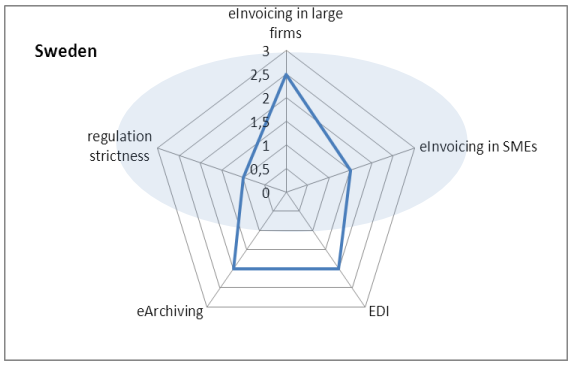
5 SUMMARY NOTES

5.1 CLASSIFICATION OF THE COUNTRIES

The different spider diagrams obtained from the countries analysis are examined and classified in this section. The diagrams are grouped according to similar characteristics, interrelationships and patterns that determine certain behaviors in a group of countries.

Depending on a specific or more characteristics, can be identified certain tendencies or instead some lack of development in an e-Invoicing dimension.

- HIGH eInvoicing DIFFUSION WITH LOW REGULATION STRICTNESS



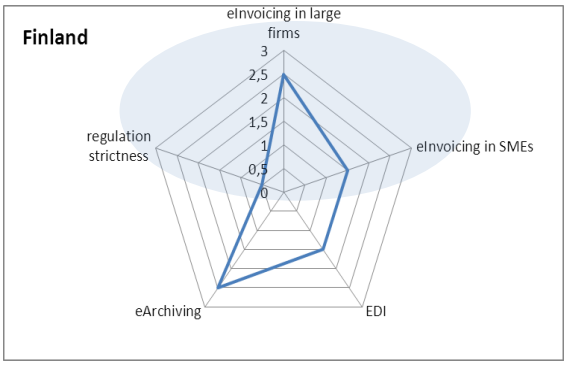


TABLE 27 - HIGH EINVOICING DIFFUSION WITH LOW REGULATION STRICTNESS

The diffusion of eInvoicing is strictly related to the regulatory framework. If the government promotes the eInvoice use and there are not too many requirements to be respected, a wide diffusion is just a consequence.

Sweden and Finland belong to this category, confirming the tradition of eInvoicing spread in the Nordic countries. As can be noticed in the diagrams the diffusion in large enterprises is very high but also in the SMEs the practice is adopted with a relatively high level if compared to the rest of Europe. This tendency is led by the standards used in the countries which are easy to be implemented and allows internal interoperability. The two nations adopt different standards based on XML: in Finland there is the Finvoice while in Sweden the Svefaktura (explained in the empirical analysis).

- HIGH eInvoicing DIFFUSION WITH HIGH REGULATION STRICTNESS

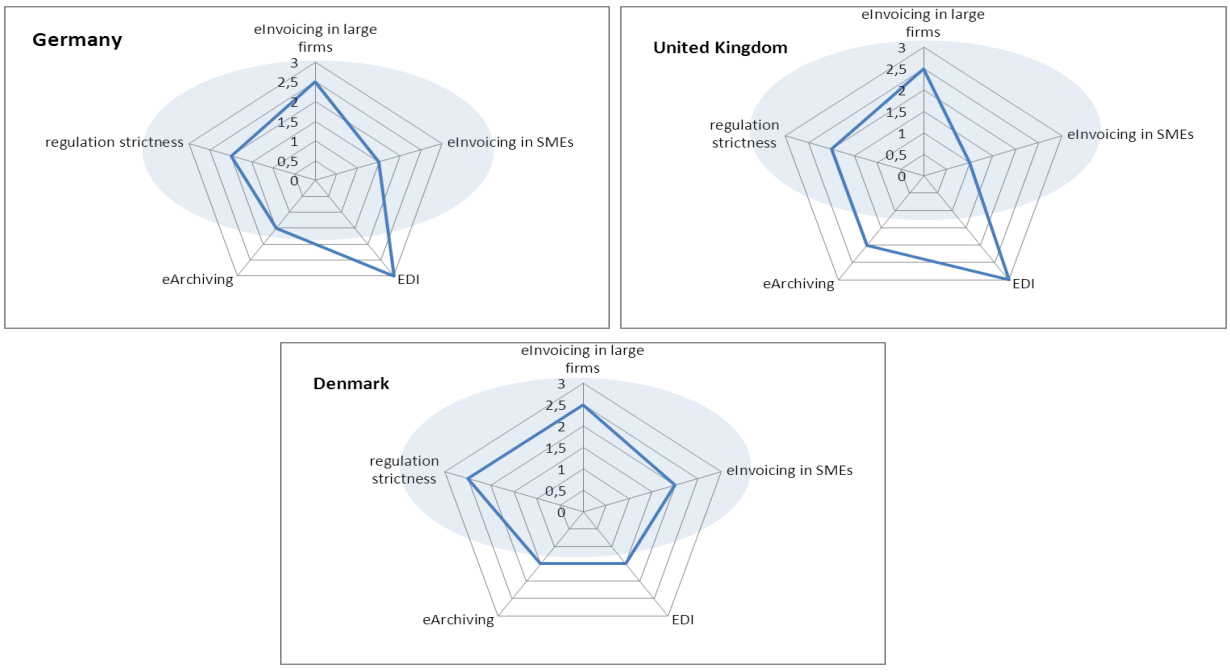


TABLE 28 - HIGH EINVOICING DIFFUSION WITH HIGH REGULATION STRICTNESS

The countries categorized in this schema are the one able to overcome the strictness of the regulatory framework. They are Germany, United Kingdom and Denmark and for each of them is dedicated a specific section in order to understand how they went over the problem.

Germany has an economy based on engineering, especially machinery, automobiles, chemical goods and metals characterized by high level technology, productivity and innovation. In this context the large enterprises has to deal with supply chain management optimization. This need pushes the diffusion of eInvoicing with a high level of EDI communication (European leader). Talking about the SMEs the level of diffusion is still medium/low. In fact the phenomenon is driven by the enterprises and not by the government, hence these firms that are not facing the need of supply chain integration do not perceive the advantages of the practice.

United Kingdom is characterized by a large use of EDI especially in the large firm (80%). This adoption, particularly relevant in the fast moving consumer goods industry, promotes as natural consequence the electronic invoicing use. The government, as highlighted in the interviews, doesn't care too much about the topic and do not promote the diffusion of the practice.

Last, but not least, Denmark is one of the most developed countries in terms of eInvoicing diffusion both in large firms and in SMEs. The reason is that eInvoicing is mandatory since 2005 towards the Public Administration so many firms had the chance to touch the benefits that the practice can give also to small businesses. Moreover there is a typical Danish standard that is the OIOXML that is very diffused and, as in the Finnish and Swedish cases, allows interoperability.

- MEDIUM/LOW eInvoicing DIFFUSION WITH HIGH REGULATION STRICTNESS

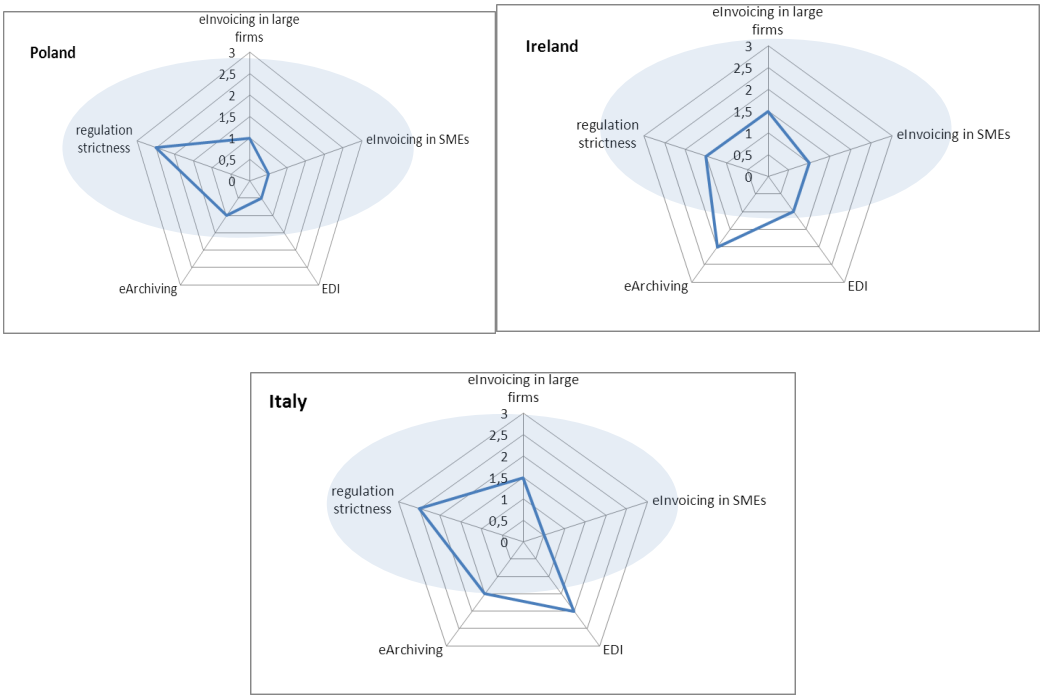


TABLE 29 - MEDIUM/LOW EINVOICING DIFFUSION WITH HIGH REGULATION STRICTNESS

Poland, Ireland and Italy are the countries that do not exploit the potential of eInvoicing, even if with different magnitude.

Poland is the country with the lowest penetration. The choice of the government to do not promote the eInvoicing adoption and the preference of the enterprises to choose the paper based invoice makes clear, in the shape of the spider diagram, the poor orientation of the country towards the practice.

Ireland and Italy are countries that are increasing the use of electronic invoicing especially in the large enterprises, while in the SMEs, the penetration is still low. The development of Ireland is possible due to the fact that is a country with a lot of businesses in UK, hence a possible driver of the process are the British companies. In

Italy instead, the main driver of development is the government. In spite of a strict regulation, it is promoting the adoption of eInvoice with actions like the obligation to use electronic invoicing towards the Public Administration from June 2014.

5.2 A ZOOM ON GERMANY, ITALY AND UK

The thesis is more focused on three countries which are Italy, Germany and United Kingdom and, in this paragraph, they are confronted in order to highlight the similarities and differences.

5.2.1 ELECTRONIC INVOICING

The electronic invoicing penetration and adoption in Germany, UK and Italy is different. The first two country have a similar penetration (15%-40%) while Italy has a diffusion between the 40% and 50% if the non-structured format is considered, otherwise the pure electronic invoicing has a penetration of about 1%. Germany, Italy and UK have adopted the EU Council Directive 2010/45/EU as an integration of the EU Council Directive 2006/112/EC that, obviously, is still valid. The electronic invoicing practice, in order to be put in place, has to respect different requirements. In Italy the law is particularly strict, in fact there are different transmission modalities depending on whom the document is destined:

- If the electronic invoice involves the Public administration there is only a method to do it. The document, or the batch of documents, must be on XML format and must have the qualified digital signature.
- If the document do not involve the Public Administration can be sent

- via e-mail (e.g. PDF) with the digital signature,
- via EDI as the Commission Recommendation 1994/820/EC of 19 October 1994 where the authenticity is guaranteed by the technology itself,
- with appropriate business control methods that guarantee the 'authenticity of the origin' and the 'integrity of the content' of eInvoices transposing the Council Directive 2010/45/EU.

Regarding UK and Germany there is no distinction of standards used if the invoice is directed to the PA or to “normal” businesses and the above mentioned methods are used in these countries as well.

The three nations allow the electronic invoicing in all its aspect: “normal” eInvoicing, self-billing and eInvoicing on-behalf. The relationship between supplier and customer is different indeed.

In Italy there must be an informal agreement among the parties. An e-mail exchange it’s OK.

In United Kingdom the government doesn’t oblige the taxable people to set an agreement but, in practice, if a supplier (or a costumer) has to issue an invoice via EDI, he/she has to know if the counterpart has the technology. Therefore an informal communication is required.

Germany’s law doesn’t oblige the parties to set an agreement. It is enough to put the e-mail address on the business letter in order to let the partner knows the will to

communicate through eInvoice. Once the document is sent the communication is considered valid if the receiver does not reject the invoice.

		ITALY	UK	Germany
eInvoicing	Definition	*Electronic invoices are electronic documents with the aim of guaranteeing the authenticity of the origin and integrity of the data transmitted.*	*Electronic invoicing is the transmission and storage of invoices, without the delivery of paper documents, by electronic means.*	*An invoice that is both sent and received electronically. EInvoice is created and sent between two parties system and can be processed automatically*
	Allowed methods to guarantee the authenticity	-Business control methods -Digital signature -EDI -time stamping (mandatory)	-Business control -Digital signature -EDI	-Business control -Digital signature -EDI
	Agreement	Yes, informal	Yes, only in EDI transmissions	Yes. The agreement is valid if the receiver do not reject the eInvoice

TABLE 30 – EINVOICING COMPARISON

5.2.2 EDI AND SECURITY REQUIREMENTS

In all the countries, regarding the security methods, is required the electronic signature for the documents do not exchanged via EDI. In particular in Italy and in Germany is mandatory while in UK a fiscal entity is not liable to prosecution if the

signature is not present. Talking about EDI, the situation is the same in the three nations: the authenticity is guaranteed by the technology, hence the digital signature is not required . The last adopter is Germany where, until 2009, there was the need to put the digital signature also to this kind of documents.

		ITALY	**UK**	**GERMANY**
EDI	Possibility to keep the EDI flow	Yes	Yes	Yes
	Agreement	Yes	Yes	Yes
	Communication	recipient consent	agreement between the parties	The sender of the invoice must document the electronic process that it uses to send the invoice. This documentation must clearly show that the employed process fulfills the legal requirements.
	Main normative criticalities	More control on the messages between the phase of generation and the substitute archiving	There isn't a law to monitor the messages and the can't be cancelled	You need to have an EDI agreement in place before starting exchanging EDI data.

TABLE 31 – EDI COMPARISON

5.2.3 ELECTRONIC ARCHIVING

In Italy, Germany and United Kingdom there is the possibility to electronically archive all the documents, both the electronic one and the natively paper based one. As stated in the EU Council Directive 2010/45/EU, the documents which are electronic for all the life cycle must be stored in an electronic way. The storage period is also different. In Italy and Germany is equal to 10 years while, in UK, is 6 years. A legal requirement that is compulsory in Italy it's the use of time stamping on the documents archived. In Germany and UK this is not required.

The most important results are summarized in a matrix to best clarify the similarities and differences regarding eInvoicing, EDI and eArchiving.

		ITALY	**UK**	**GERMANY**
eArchiving	Possibility to electronically archive other documents	Yes	Yes	Yes
	Years	10	6, the period can be shorten setting an agreement with the HRMC	10
	Possibility to outsource the service	-Always in EU-When the country respects the requirements	-Always in EU-When the country respects the requirements also	-Yes , when country respects the requirements

		also outside the EU	outside the EU -On-line access to the invoices	
	Possibility to store the documents on paper	-All the natively electronic documents must be stored electronically	-it is possible but not the one in EDI format that has to born and be archived electronically.	-All the natively electronic documents must be stored electronically

TABLE 32 – EARCHIVING COMPARISON

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