e-invoicing in cross-border trade

Kommerskollegium
National Board of Trade

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Summary

The transition from paper invoices to e-invoices is an example of how new technology can improve and rationalise previous manual and lengthy procedures. The purpose of the study is to give a description of precisely what the primary barriers are to increased cross-border use of e-invoices. An increased use of e-invoices should facilitate international trade and simplify a process that currently requires many manual and repetitive actions.

An invoice is not a document that can be handled in isolation without being included in a process. In electronic form, there is the option of connecting other requirements to an invoice. This can, by extension, contribute to reducing the administrative burden for companies, but at the same time it poses higher requirements for security and the harmonisation of laws and regulations.

The national legislation of different countries that control the validity and acceptance of e-invoices based on a legal, financial and administrative perspectives are currently the primary barrier to cross-border use within the EU. The differences are partly a result of the common regulation on VAT that exists within the EU, giving member states the opportunity to conduct different practices. Another barrier is that an e-invoice can be formulated in a number of different formats and in accordance with different standards. This obstructs the flexible transfer of e-invoices between different companies.

The directive concerning the common system for the management of VAT during invoicing was made to create clarity in the rules concerning invoicing within the EU. The common system that exists within the EU for managing VAT is a function that is connected to the use of e-invoices. Experiences and studies have shown that the directive has not been implemented and inter-preted in a similar manner by the EU's member states. In an attempt to simplify e-invoicing, the Commission has taken the initiative to amend the directive. The new directive will contain a number of changes, but the most important one for e-invoicing is that member states must not present additional requirements on e-invoices than those requirements they presently use on paper invoices. However, different technical solutions will still exist within the new directive. For the international application of e-invoices, the interpretations by individual member states will become important, since each difference gives rise to uncertainty and increased costs for companies.

It is important that Sweden continues to highlight the fact that e-invoices and paper invoices should be treated in the same manner, without the requirements for additional information on e-invoices. Nationally, Sweden can contribute by looking at how other legislation can be changed so that it does not become an indirect barrier to the cross-border use of e-invoices. As an example, the work of implementing the new VAT directive should begin early so that companies will be able to adapt their procedures and processes to the preconditions that the new directive involves.

1. Purpose of the study

One fundamental concept with electronic business is that important documents that are required for trade should be sent and handled automatically instead of manually. As early as the 1970s, EDIFACT has been used[1] by large companies in order to send, for example, electronic invoicing. This system was based on the company creating a direct link between the business systems of two companies and it required relatively large investments by the companies. The accounting and bookkeeping were then handled via paper.[2] The big breakthrough came with the Internet, and the increase in the number of opportunities it provided for companies to rationalise and simplify their businesses. This has led to companies being offered different technical solutions for managing their invoices. The electronic management of invoices also provides new opportunities in other areas. For example, certain requirements that follow by law for other areas may be handled via the invoice in an electronic management. At present there is a lack of clarity regarding many areas of e-invoicing.

The purpose of the study is to give a description of precisely what the primary barriers are to the increased cross-border use of e-invoices. Increased use of e-invoices would facilitate international trade and simplify a process that currently requires many manual and repetitive actions.

Complicated requirements for documentation and other procedures, for example the customs duties area, are expensive for companies and authorities. Trade facilitation encompasses a set of different efforts in order to facilitate international trade. These relate to regulations and controls, transport, information and the utilisation of modern technology, as well as systems for making payments. Trade facilitation contributes positively to international trade. When customs duties disappear, other types of barriers will become relatively more burdensome and visible to companies.
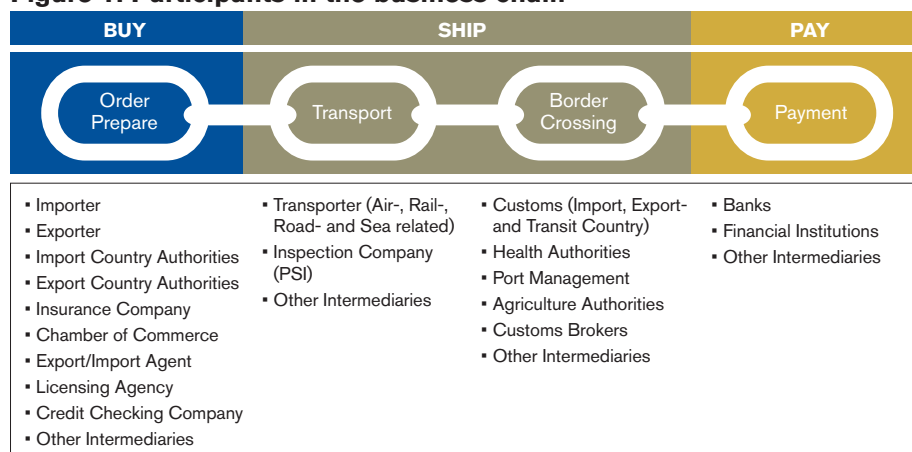
The UN body UN/CEFACT's definition of trade facilitation is: *"the simplification, standardisation and harmonisation of procedures and associated information flows required to move goods from seller to buyer and to make payment."* The definition is broad and concerns a number of activities in the entire business process, from an order being placed to the goods crossing the border, being checked, transported and the final payment being made. Within the WTO, negotiations are taking place concerning trade facilitation, but the work here is based on a more narrow definition. Much emphasis obviously lies in simplifying border crossings and the actual physical transport of goods, the efforts here, such as co-ordinating the authorities at border crossings and minimising the number of documents that are required, are important parts of this. Through standardisation, harmonisation, simplification and increased transparency, business procedures can be simplified.

In Figure 1, a chain of events is shown that are included in a business transaction – buy, ship, pay. The entire process is included in the concept of a business procedure. The invoice comes in at the end of the process; however, the information that is needed to be able to send the invoice is already available when the order is placed. With an automatic process, the manual handling, and therefore the risk of errors, is reduced.

The transition from paper invoices to e-invoices is an example of how new technology can improve and rationalise earlier manual and lengthy procedures. No further explanation needs to be presented here of precisely what requirements are connected to invoicing or what an efficient invoicing process looks like. The continued description will instead focus on the specific barriers that exist to companies using e-invoicing, connected with, first and foremost, cross-border applications. The purpose of the study is to show precisely what barriers exist to cross-border applications. The study is based on a trade facilitation perspective.

Figure 1: Participants in the business chain

BUY	SHIP		PAY
Order Prepare	Transport	Border Crossing	Payment
• Importer • Exporter • Import Country Authorities • Export Country Authorities • Insurance Company • Chamber of Commerce • Export/Import Agent • Licensing Agency • Credit Checking Company • Other Intermediaries	• Transporter (Air-, Rail-, Road- and Sea related) • Inspection Company (PSI) • Other Intermediaries	• Customs (Import, Export- and Transit Country) • Health Authorities • Port Management • Agriculture Authorities • Customs Brokers • Other Intermediaries	• Banks • Financial Institutions • Other Intermediaries

Source: UN/CEFACT International Chain Reference Model

2. Barriers to increased cross-border use

Converting to e-invoices means, from a simplifying perspective, that a process that currently takes place mostly on paper will instead occur electronically and in an automated manner. Today, different barriers and problems exist that can cause a company to hesitate to switch to e-invoicing.

At present, e-invoices are primarily used between companies on a national basis. There are a number of explanations for this. This depends, in part, on how far countries have come in using IT, and, in part, on cultural aspects, such as interest in new technology In many countries there are national initiatives for encouraging a transition to e-invoicing – in many of these their cross-border use is not being given priority. The national use is constantly increasing, whereas cross-border use is not increasing in the same manner. At present, there are uncertainties concerning the specific statutes and precisely which regulations apply to cross-border use, and this is making e-invoicing difficult to extend across national boundaries.

Possible savings in time and money

With different degrees of integration and automation, different time and cost savings are produced. What is meant by manual handling is the traditional handling of a paper invoice: where a physical paper invoice is sent and physically dealt with by the company that receives the invoice. What is meant by semi-manual handling are those techniques that exist today where parts of the information that are needed in an invoice occur automatically in a business system or where parts of the process and handling occur electronically via processes. The important information that can be discerned from this is not the exact time or cost saved but the clear trend that increased degrees of automation lead to larger savings both in time and money.

Table 1. Potential savings per e-invoice

Degree of automation	Outbound	Incoming	Total
Manual handling	14 min € 28.8	10.5 min € 18.55	24.5 min € 47.35
Semi-manual handling	10 min € 18	6 min € 11.10	16 min € 29.10
Automatic handling	1 min € 3.3	6 min € 10.8	7 min € 14.1

Source: 'Electronic Invoicing Initiatives in Finland', Helsinki School of Economics, 2008

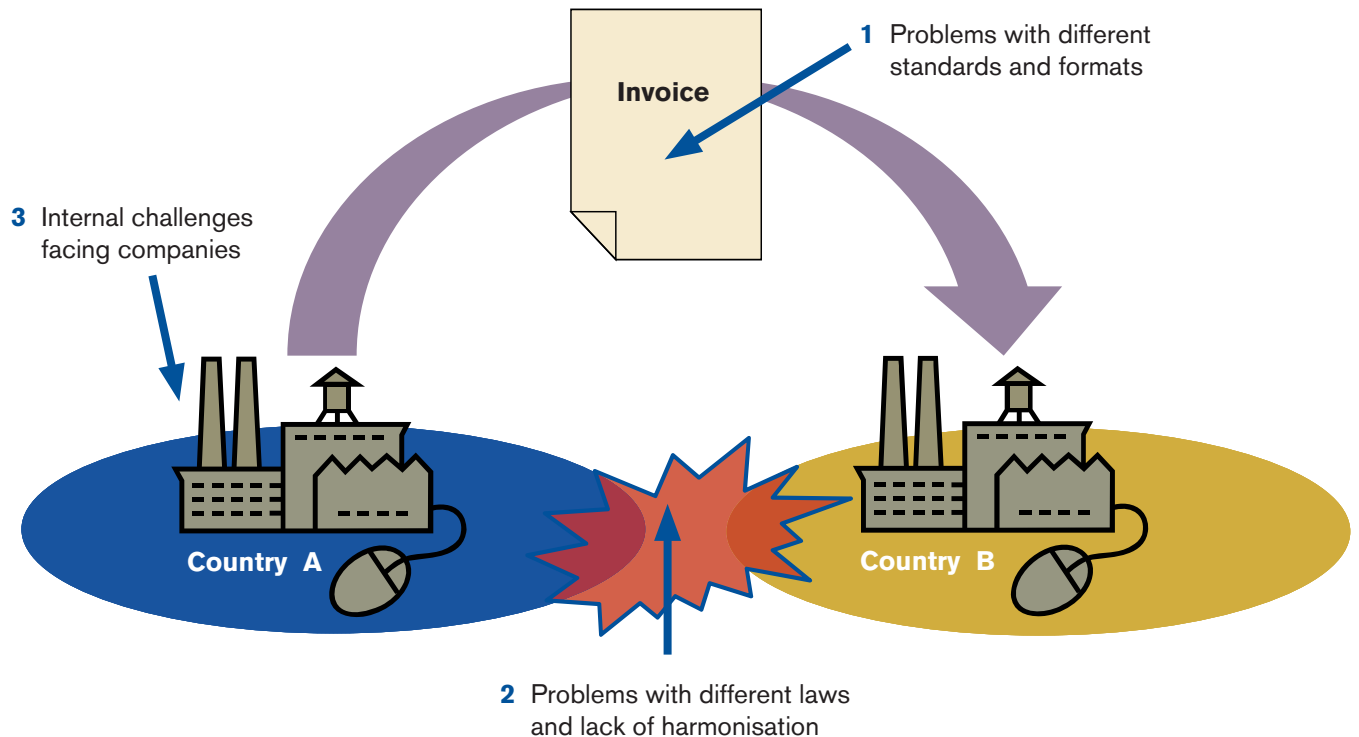## Barriers to switching to e-invoices

Internal barriers within companies
- Requires a change in the manner of working internally in order to be successful
- May require the purchase of a new system/IT solution
- Requires that processes within the company be refined

External barriers
- The solution must be compatible with applicable legislation in other areas
- Suppliers/customers are not interested in using e-invoices
- Requirements for special technical security solutions (e-signature)
- Different requirements for e-invoices and paper invoices
- Differing national requirements and rules for international use

Figure 2: Barriers to switching to e-invoices

1 Problems with different standards and formats

3 Internal challenges facing companies

Invoice

Country A

Country B

2 Problems with different laws and lack of harmonisation

Source: National Board of Trade

Today, different barriers counteract the increased use of cross-border e-invoicing. These different barriers will be described in the study, as well as what is needed in order to remove them. One important barrier is the difference that exists in the national legislation of different countries which controls the validity and approval of e-invoices based on a legal, financial and administrative perspective. These differences make the cross-border use of e-invoices difficult within the EU. The differences are partly a result of the common regulation on VAT that exists within the EU, giving member states the option to conduct different practices. The problem with national legislation lacking harmonisation and unclear legislation within the EU will be described in Chapter 3.

Another barrier is that an e-invoice can be prepared in a number of different formats and in accordance with different standards. This obstructs the flexible transfer of e-invoices between different companies. The problems with different standards and formats are described in Chapter 4.

Finally, there is a third type of barrier that involves the company's internal barriers and changing the way in which they manage their invoices. This relates to the existence of uncertainty surrounding security issues and a lack of information concerning different solutions in the use of e-invoices. The fact that the set up costs can be high can also be a contributing cause. The problems with internal barriers within companies are described in Chapter 5.

These are three types of barriers that will be highlighted in the rest of the study. Viewed from a policy perspective, the main emphasis lies with those problems that are concerned with the national legislation of different countries, the lack of harmonisation and unclear legislation within the EU. This becomes clear in cross-border applications and it is also the responsibility of stakeholders at member state level. Figure 2 illustrates the types of barriers companies face.

3. Problems with different laws and a lack of harmonisation

E-invoices are more than just an electronic picture of a paper invoice. With an e-invoice, a number of different intelligent solutions also occur and with such a 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. A part of the requirements that are connected to invoices are an effect of national legislation on adjoining areas. For example, the requirements that exist in book-keeping rules and auditing legislation can be complied with without a company needing to undertake active measures manually. It is this type of automa-

tion that makes the process profitable for companies. The common system that exists within the EU for handling VAT is another function that is connected to the use of e-invoices. Since the invoice comprises the document that makes it possible for companies to receive a refund of VAT, the invoicing within the EU becomes more complicated since it poses further requirements on the invoice. Under 3.1 the specific problems and barriers which the common legislation and the various implementations and applications in the EU entails are described. After that, there is a section that describes the common VAT system and the changes made to try to overcome the short-comings that exist regarding e-invoicing.

Different requirements in connection with e-invoices

In trade with countries outside the EU, there is no common VAT directive connected with invoicing to take into consideration. The companies that the National Board of Trade has been in contact with see, from an e-invoicing perspective, both benefits and drawbacks in this. The lack of a common system for VAT handling does not necessarily make it easier. However, the expectations that it will function are, presum-

ably, lower, with companies being prepared to go to great lengths to determine what the preconditions are. The table below[3] shows a number of countries and their rules in relation to e-invoicing. The conclusion that can be made here is that there are countries where it is forbidden to use e-invoices but also countries that do not have any special requirements at all for e-invoices.

Table 2. Different requirements for the use of e-invoices in selected countries

Country	Number of years that an invoice must be saved	Permissible to use EDI(Electronic Data Interchange)	Permissible to use e-invoices	Requirement for an agreement between parties that use e-invoices	Manner by which integrity and authenticity can be guaranteed
Australia	7	Yes	Yes	Yes	No special requirements
Brazil	10	No	No	-	-
Canada	6	Yes	Yes	No	Advanced electronic signature
China	10	No	No	-	-
India	8	No	No	-	-
Japan	10	No	No	-	-
Mexico	10	Yes	Yes	No	Qualified electronic signature
Russia	4	No	No	-	-
Singapore	7	Yes	Yes	No	No special requirements
South Africa	5	Yes	Yes	Yes	Qualified electronic signature
Turkey	10	No	No	-	-
USA	7	Yes	Yes	No	No special requirements

3.1 Problems with cross-border use of e-invoicing within the EU

The cross-border use of e-invoices within the EU today is limited. The cross-border use of e-invoices involves a company having to take into account and adapt itself to the legislation and requirements of a number of other member states. There are direct requirements of e-invoices; however there are also other laws and requirements that indirectly affect the use of e-invoices. The focus here lies on the common system for VAT management within the EU, which for cross-border e-invoice use is a great barrier.

No overall survey exists as to what rules and regulations have to be met when using e-invoices within other EU member states. In particular, there is no compilation of all indirect legislation that has an influence on e-invoicing. In a synthesis that the Swedish eBusiness Network NEA[4] presented in 2006, some examples were taken up. The following primary characteristics can, according to NEA, be established:

- Certain countries require that an invoice be signed by a qualified electronic signature and that, in the event that EDI is used, a summary document in paper form be created at periodic intervals (for example: Spain, Poland and Bulgaria).

- As above, although the summary document can also be in electronic form signed by a qualified electronic signature (for example: Germany).

- Other countries' laws involve an e-invoice being signed with an advanced electronic signature or being sent with EDI where the authenticity and integrity are ensured in accordance with an agreement (for example: Austria, Luxembourg and France).

- Other countries give the option to use other methods for e-invoicing, under the precondition that authenticity and integrity can be guaranteed (for example: Denmark, Ireland and the UK).

- Certain countries pose no requirements on signatures or the ensuring of authenticity and integrity, and accept all methods as long as the invoice remains correct and unaltered (for example: Sweden and Finland).[5]

- Certain countries require a summary paper report as a supplement when e-invoicing is used. This is a possibility that exists in the present directive (for example: France, Hungary and Spain).[6]

These are just some examples of how differently e-invoicing functions in practice in the EU.

Adapting procedures and living up to the requirements of different countries concerning e-invoices is expensive, and companies that the National Board of Trade has been in contact with[7] are of the opinion that this is the greatest barrier to cross-border use. The uncertainty causes many companies to choose to continue with paper invoices so that they do not risk having any problems with possible tax audits. Companies devote large amounts of resources to establishing exactly what is applicable and precisely what requirements are imposed by the tax authorities. One of the companies questioned has produced information on the possibility of using e-invoices in Europe and described it as being simple in the northern European countries, however, the further south you go, the more difficult it becomes. The laws surrounding e-invoicing are so complicated that national legislation and practices for common VAT rules make it impossible to use e-invoices. Other companies have experienced tax authorities requiring that e-invoices with electronic signatures be printed out and submitted in order for VAT to be refunded (stating Germany, among others, as one of the countries requesting this action). The problem is that an electronic signature is not visible on a printout, something that the company has pointed out but not received any sympathy for.

A further problem is that it is difficult to receive notifications from different tax authorities concerning precisely which requirements must be fulfilled concerning security and authenticity for e-invoices in order to be able to account for VAT transactions. This can, for example, mean that the formal requirements that are put forward and the
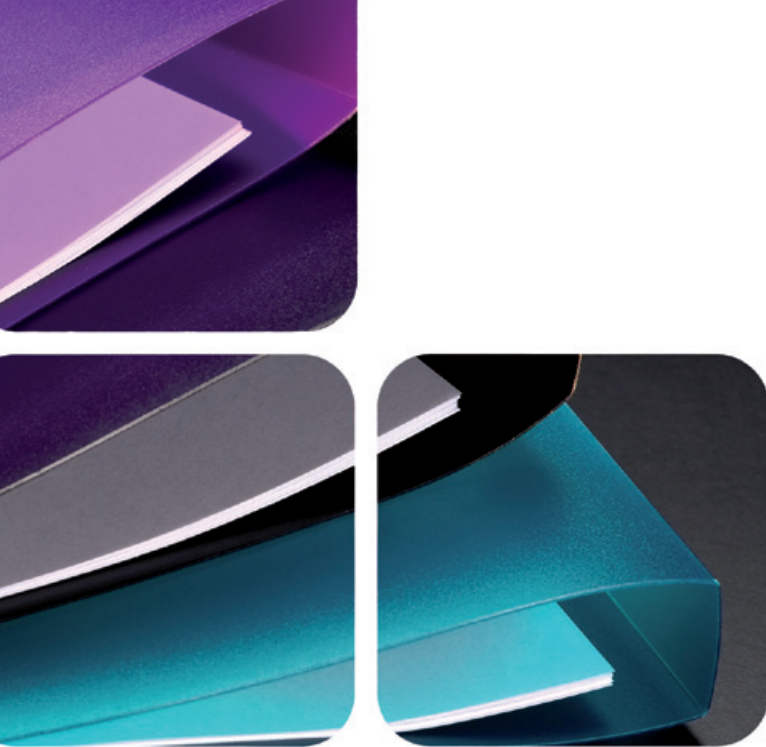
requirements that are actually applied in practice are different. In many circumstances, it is not possible to receive a detailed reply in advance from the tax authorities in certain member states concerning the specific requirements that must be fulfilled regarding the use of e-invoices. Certain companies solve this by avoiding the formal requirements, since it would not function if they followed the different requirements that are set out by member states.

In large multinational companies, the introduction of e-invoicing is conducted, first and foremost, as a separate project in different countries.[8] Large companies that use e-invoices today have in many cases not progressed equally as far with respect to cross-border use. Many have pilot projects or support the preconditions for commencing cross-border use. Representatives of a company in Sweden have said that at present they have no plans to go over to e-invoices with their international suppliers.[9] The handling of invoices by companies that use e-invoices today therefore changes depending on whether the invoice is coming from a Swedish or foreign supplier.

In Sweden and Finland, among others, there are no special requirements for an e-invoice with regard to how it is sent in order to be secure. Instead of requiring EDI or an e-signature, no further requirements are posed other than those that are included in paper invoices. This follows the recommendation provided in UN/CEFACT's recommendation 6 - that laws and regulations alone should set out requirements that provide effective control with regard to the cost to businesses. The tax authorities and other authorities must not put forward requirements for special technical solutions, but rather let companies imple-

ment electronic invoicing in a manner that suits them and which ensures the legal requirements that exist for invoicing to be fulfilled.[10] Many are of the opinion that this is one reason why the Nordic countries have a higher degree of e-invoice use than other countries in Europe. As stated above, large companies are confirming the belief that e-invoicing becomes more complicated the further south you go in Europe.

In the same UN recommendation it is also stated that governments and tax authorities should monitor trends in the implementation of e-invoicing and co-ordinate the development of the markets. Adaptations and changes ought to be formulated on the basis of the least possible intervention and ongoing harmonisation of legislation should to be aimed for so that the current patchwork of national regulatory bodies becomes more harmonised, which should promote both more effective crime fighting with regard to VAT frauds and assist in trade, within and across borders.[11]

Overall, this shows that the ability to use e-invoicing are different between member states, which may have contributed to the limited use of e-invoices. The next section will describe the existing common directive that regulates the preconditions for the use of cross-border e-invoices in the EU.

3.2 New directive to facilitate e-invoicing within the EU

At present, different directives exist for the use of cross-border e-invoices. The implementation of the directives has been done in different ways across member states, which has created barriers. This directly concerns the directive on a common system for handling VAT in connection with invoicing and indirectly concerns the directive that governs the use of electronic signatures. The common system for handling VAT in connection with invoicing is primarily governed by one directive. The directive was first issued in 2001[12] and has been in force since 1 January 2004. Through the directive, a common system was created for handling VAT during invoicing. The background to the directive was that with cross-border e-commerce a problem arose with invoicing. This involved, among other things, e-invoices requiring different special requirements. With a common system handling VAT during invoicing, in theory many barriers would be

avoided, but in practice this has not been the case within the EU.

During its implementation, different interpretations were made by member states of the specific requirements that could or would be imposed. Certain countries saw an opportunity to demand higher security for e-invoices through so-called qualified electronic signatures or requirements for EDI. Other countries saw an opportunity to not put any special requirements on e-invoices and chose the option that exists under the directive to do this. These two interpretations are some distance away from each other and have created problems for companies if they have been active in several countries. In practice, this has involved companies devoting substantial resources to finding out what is applicable in a specific country.

With the current wording in the directive, countries may require that the authenticity and integrity of e-invoices be maintained by transmitting them via one of the following methods:

- Advanced or qualified electronic signatures
- EDI[13]
- Other methods as per national practices[14]

The directive concerning a common system for the management of VAT during invoicing was created to give clarity to the rules concerning invoicing within the EU. The review that was carried out, in the form of a number of reports, showed that the directive had not been implemented and interpreted in a uniform manner by the EU member states. In 2007, the Commission appointed an e-invoicing Expert Group that was commissioned to produce a European framework for e-invoicing. In its final report in 2009,[15] the Expert Group ascertained that member states had not implemented the directive in a uniform manner, which, among other things, limited cross-border invoicing. The special security requirements for transmitting e-invoices were identified as being a major obstacle.

In their final report, the Expert Group emphasised that a transition to e-invoices within the EU must positively contribute to the long-term objective of minimising the administration for companies as well as contributing to reducing the burden on the environment. The aim of increasing the competitiveness between companies was also emphasised. One of the central recommendations of the Expert Group was to end the likelihood of member states creating special security require-

ments for the transmission of e-invoices. This was expected to lead to equal treatment for the electronic and paper-based transmission of invoices.

In January 2009, the Commission took the initiative to change the directive to, among other things, facilitate cross-border use. The proposal was intended to simplify, modernise and harmonise the requirements for invoicing with regard to VAT. The Commission's proposal for change followed the Expert Group's recommendations. The Commission proposed altered rules within the following areas:

- ability to demand taxes for transactions internal to the common market
- rights to deductions
- issuing of invoices
- content of invoices
- e-invoicing
- storage of invoices.[16]

For this study , the area concerning e-invoicing has been particularly central.

The proposed directive was the object of political negotiations during the presidencies of Sweden and Spain. On 13 July 2010, the Council of Ministers adopted changes to the directive on a common system for handling VAT in connection with invoicing. The new wording must be implemented by member states by 1 January 2013 at the latest.[17] The new directive contains a number of changes, but the most important one for e-invoicing is that member states may not suggest requirements of e-invoices other than those that are required for paper invoices. The technical requirements for e-invoices that exist today will be removed and replaced with general requirements that invoices, both paper invoices as well as electronic invoices, must be authentic and that their content must not been altered. In the Commission's original proposal there was no wording concerning technical solutions. The final wording was adopted after a compromise between member states, where EDI and e-signatures are still described as two examples of how a company can guarantee the authenticity and integrity of the content. This can lead to these two methods still being an indirect requirement for e-invoices. The interpretations of the directive will play a large role for companies. For the international application of e-invoices, the interpretations by individual member states will become still more

interesting since each difference gives rise to uncertainty and increased costs for companies.

The Swedish Ministry of Finance, which is responsible for the issue in Sweden, has assessed that the proposal can at the beginning involve a cost to certain companies, since it requires certain reconfigurations of procedures for companies. However, the decision is deemed to primarily be a step towards simplification that will positively affect the situation for companies.[18]

Since the changes will not enter into effect before 1 January 2013, it is difficult, today, to say how they will affect companies and how the tax authorities will apply the directive in individual cases.

3.3 Requirements of advanced e-signatures

Electronic signatures are different technical methods that can be used to sign or authorise electronic documents. In technical terms, this can be done in a number of different ways. In certain member states of the EU, it is required that the sender uses an electronic signature when e-invoices are used. This becomes a problem for companies that send e-invoices to other member states, since there is no common standard for e-signatures. Different national requirements for e-signatures make it more expensive and difficult for companies to use e-invoices internationally. In practice, this is a tangible reason for many large companies avoiding using e-invoicing in certain countries.[19] One solution for companies could be to outsource the service to a company that can offer to convert e-invoices and add the type of e-signature that is required by the individual country. E-signatures are one of the approved methods for transmitting e-invoices that are available under the VAT directive, and this has created problems with cross-border use. In the new wording, e-signatures will also be named as an example of a secure transmission method.

Within the EU, there is a directive that regulates electronic signatures. The purpose of the directive on electronic signatures[20] is to promote the legal recognition of electronic signatures and to ensure the free movement in the internal market of products, equipment and services. In the directive, three types of electronic signatures are dealt with. The first is what is called a simple electronic signature. This is a broad concept and the purpose of an individual electronic signature is to identify the person who is signing the document and to verify information. This can involve something as simple as signing an e-mail

message with a person's name or using a PIN code. The second type is called an advance e-signature. With this type of signature it is:

- connected to the signer in a unique manner
- possible to identify the signer
- created in a manner so that it can be linked only to the person who has the right to issue the signature
- linked to the information it concerns in such a way that all subsequent changes to the information can be detected

The third type, a so-called qualified electronic signature, is based on a qualified certificate that is created through a secure arrangement for the creation of signatures. This gives the highest level of guarantee that the information is coming from the specified sender and that the information being transmitted has not changed. Member states also have an option to introduce specific national solutions, which creates further barriers to the cross-border use of advanced electronic signatures. Many countries have chosen to do this, which, in practice, leads to it not being possible to use e-signatures across borders, since the mutual recognition does not function in practice.

Since Sweden and some other countries have selected a solution where the tax authorities do not pose requirements for e-signatures on e-invoices, requirements for e-signatures in certain countries involve an extra cost for companies when they use e-invoices. Swedish companies that wish to use cross-border e-invoices today must find out what the precise requirements are in the specific countries and then use the appropriate solution. The Expert Group that the Commission appointed in order to create a European solution for the use of e-invoices pointed out in its report[21] that e-invoicing must not be obstructed by differences in national legislation with respect to electronic signatures.

The greatest barrier to using e-signatures is the lack of legal, technical and organisational compatibility between different signatures and between the e-signatures of different member states . In order to improve confidence in e-signatures between member states, to begin with, the receiving party ought to be given the opportunity to check the status of suppliers of certificate services who issue qualified certificates in other member states.

3.3.1 Example of interpretations and analyses of the new directive
The changes in the directive on the common system for VAT handling during invoicing are still new, and there is still a long time until the changes have

to be implemented by the member states. It is not possible yet to see any tangible changes in practice. However, different stakeholders have begun to make different interpretations and analyses of the new wording. Some examples of the reactions are given below.

In Sweden, where the use of e-signatures in the transmission of e-invoices is not used, there is concern that the new directive will lead to an indirect requirement for e-signatures or other technical solutions. In an appeal to the Swedish Minister for Finance Mr Anders Borg, a number of industry organisations[22] pointed out the importance of not focussing on the remaining technical requirements concerning the distribution of e-invoices, but rather that the focus should be on ensuring good accounting practices and good internal controls for the business processes as a whole. The organisations are of the opinion that requirements for e-signatures are unnecessary, since an invoice sent with an e-signature does not in itself ensure that the invoice is correct. It is also thought that the opportunity for member states to require different forms of security solutions for e-invoicing ought to cease and that those member states that use e-invoicing today without special requirements must continue to be able to do so.

In an analysis performed by the Swedish Bankers' Association, which is actively following the process concerning the simplification of the directive, it is of the opinion that the new wording moves the focus from special technical methods for guaranteeing the authenticity of the source and integrity of its content to the overall administrative process between the buyer and seller. E-signatures and EDI are specified only as examples of methods that can ensure the authenticity of the source and the integrity of its content. The importance of registering transactions such as orders, order confirmations, delivery notifications, delivery slips and invoices in fact increases the ability of buyers and sellers to be able to show a connection between invoices and deliveries.

According to the Bankers' Association it is still unclear precisely which administrative controls will be deemed to have been approved by the relevant authorities in the respective member states for purposes of fulfilling the requirements for authenticity and integrity. The lack of clear guidelines in this regard means there is a risk that different member states will have different requirements. This in turn will lead to problems in cross-border invoicing. The Bankers' Association is working with other industry organisations to bring clarity to the issue.[23]

In a report that describes what the market for e-invoicing looks like in the EU[24], an analysis is performed of how the new rules in the directive will be interpreted. The analysis was performed by TrustWeaver[25], which offers different e-commerce solutions to companies. One solution that is offered is the use of e-signatures and conversions between the requirements of different countries. It is pointed out in the analysis that even if the original formulation on the equal treatment of paper and e-invoices was not the result, the principle of equal treatment has gained a breakthrough. According to the analysis, no specific technical requirements will be able to be asked of companies after this new directive comes into effect. At the same time, it is emphasised that the two technical solutions that are included in the directive today will also be able to be used as a way to guarantee the authenticity of the source and the integrity of the content. With the new directive, greater flexibility is created for how the company can guarantee authenticity and integrity (via "ways other than what the trading partner chooses" or "via administrative controls that create a reliable verification chain between an invoice and a delivery"). However, at the same time, in practice it requires that if a company does not choose one of the two methods (EDI and e-signature) listed as examples, then it must make sure that the method it chooses fulfils the requirements that are suggested based on this directive. In this way, it is impossible to say that the directive contributes to creating the clarity, which was the intention. The conclusion that was drawn up in the analysis is that the increased flexibility that exists for different methods in the new directive will give the company the option to choose, but *"the existing technological options are the only way to be certain in advance that e-invoices will be accepted as real and unchanged in all member states, as well as in all other countries with explicit e-invoicing legislation."*[26]

The analysis that is made is that an e-signature should be a way for companies to receive a clear answer to what it is that is applicable. This was not the intention of the changes that were made to the VAT directive. It is precisely this type of analysis and interpretation – that an e-signature would be the best alternative – that Swedish industry organisations are disturbed about, since this is not required in national use.

The analyses that have been presented show that there continues to be substantial space for different interpretations and that the new wording does not obviously lead to the original goal of increased harmonisation and simplification. Substantial efforts have been made in order to create a clear and simple system, but the extent to which that will be the case remains to be seen.

4. Problems with different standards and formats

With a common standard for e-invoices, cross-border use would be made easier, since everyone would speak the same language and conversions to different formats would not be needed. A common standard in that sense will not be able to be achieved, since there are different specific needs in different industries as a consequence of, for example, different information needs in the business process and different ways of producing. This can lead to problems when companies that have selected different standards need to exchange invoices. The solution is to use different middlemen (for example, a bank or a VAN supplier/service provider). The following section will describe the problems that exist because of the lack of a standard for e-invoices. The lack of a common standard for electronic signatures has been discussed in the section about e-signatures.

In general, standards can be described as solutions that are voluntary and have been arrived at by a mutual understanding in order to address what are often recurring problems. In the production of a standard it is therefore important to have participation from as many stakeholders as possible. Globalisation means that more participants are involved in the standardisation work and are working towards the production of an e-invoice standard, including the international and global perspective, is obvious, since it can support business processes between companies regardless of where they are located.

4.1 Standardisation of e-invoices

Today there are a number of standardisation bodies that are attempting to produce and develop standardised business messaging where the e-invoice is one of several types of messages. The standardisation of e-invoices involves standardising, for example, precisely what information an invoice should contain as well as how and where it is specified. For example, whether the date should be specified as 01-01-2010 or as 1 January 2010. The purpose is to create an automated flow, so it becomes important that the information that is given can be read and interpreted automatically. The standardisation issues which affect the production of a standard e-invoice encompass not only the standardisation of different business messages, but also how they

are transmitted to other parties. In addition to this, issues can be connected to it, such as electronic signatures and the importance of producing a standard common to them, which does not exist today.

In the development of a standardised e-invoice, there are different and partially overlapping standardisation processes that take place. One route is being taken by UN/CEFACT, the United Nations Centre for Trade Facilitation and Electronic Business. UN/CEFACT is working for the exchange of information, both between the public sector and private businesses, as well as just between private businesses, to be interoperable. Among other things, an international standard for electronic data exchange, EDIFACT has been produced. Through UN/CEFACT, state and non-state organisations, as well as international organisations and companies, all work together. EDIFACT is a standard that, first and foremost, is used by large companies to exchange, among other things, invoices. Different industry adaptations exist in order for it to be possible, in purely practical terms, for the standard to be applied. Examples of industries that use EDIFACT-based messaging are the automotive industry and other well-integrated industries. In different industries, adaptations are in turn completed from this standard, for example this is done by GS1, which is an industry organisation that, among other things, produces standards for applications in the food products industry.[27] To use the standard without adaptation is not desirable, since it contains too much information that is not used. The standards consist of conceptual and information structures that are then adapted to applications in a technical format.

UN/CEFACT produces standards but does not participate in the implementation work. The implementation must be handled by the market. In contrast, there are a number of initiatives outside UN/CEFACT where user groups are attempting to limit what is needed in order to ensure the standard is used on a purely practical basis.

Another player in standardisation is the Organisation for the Advancement of Structured Information Standards (OASIS), a non-profit international consortium that drives standards in the e-commerce area. At OASIS, Universal Business Language (UBL), which is a standard for electronic business messaging, has been produced. UBL is a library of documents for business transactions.

One further player in the standardisation area in e-commerce is ISO, an international standardisation body, represented by national standardisation institutions that work with industrial and commercial standardisation. ISO produces standards by working in technical committees. What is relevant for this area is that they are intending to produce a financial EDIFACT. ISO 20022 is a platform for developing standardised message types for the financial world. In it, e-invoices can also be a type of message.

At CEN[28], the EU's standardisation body, there are a number of different workshops that concern e-commerce and e-invoicing in different ways, where different users meet and adapt the applications to be as uniform as possible. The working methodology with workshops producing applications has been used for a long time and a workshop is usually ongoing for several years, and at the end a workshop agreement is delivered. The benefit is that both private and state stakeholders meet. An example of a CEN workshop is the workshop e-Invoicing 3, where different legal aspects are addressed for having invoices fulfil requirements that exist on the basis of a number of perspectives, including that of a VAT perspective. The workshop was established in connection with the first VAT directive being produced, and a third workshop has just started operation. Another important workshop is CEN BII[29], where both state and private stakeholders meet in order to produce a body of regulations and specifications for technical interoperability for electronic business messaging within EU inclusive recommendations. The specifications are based on business requirements and the legislation that exists and encompasses both the processes concerning public procurement as well as ordering up though and including the invoicing process. With regard to invoices, this may be used in both the public as well as the private sectors.

Overall, this shows that the standardisation of e-invoices is an area with a number of players where partially competing solutions are being produced.

4.2 Interoperability – the importance of being able to communicate between different systems

In the telecommunications area customers are able to communicate with each other despite having different types of subscriptions in different countries with different terms and conditions. Customers do not need to know precisely which supplier the per-

son being called was communicating with, all that is needed is a telephone number. Instead of the users and customers knowing the exact relation between their companies, this is resolved in agreements between the companies. This is, of course, a highly simplified picture, but it illustrates what many within the EU wish to achieve with cross-border use of e-invoicing, namely that the users select solutions that suit them based on a number of different factors, but that they can then use their solution in contacts with suppliers and customers who have selected different solutions. Standards that create interoperability are important in the area of IT. Work is ongoing within the EU to make it possible for different IT solutions and systems to still be able to work with information across the borders between EU member states. What is meant by interoperability is: *"the ability of information and communication technology (ICT) systems and of business processes they support to exchange data and to enable the sharing of information and knowledge."*[30]

CEN defines interoperability as: *"a state which exists between two application entities when, with regard to a specific task, one application entity can accept data from the other and perform that task in an appropriate and satisfactory manner without the need for extra operator intervention."*[31]

One existing structure is to differentiate between technical interoperability, semantic interoperability and organisational interoperability. When a need exists for further precision, then syntactical interoperability and legal interoperability can also be added to these.

In the EU, the Peppol 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 e-invoices while at the same time also being able to use cross-border e-invoicing within the EU.

In the final report from the Expert Group, the question of interoperability was addressed and a number of points concerning the least common denominator were specified, which should make it possible to communicate between different countries and with different solutions.[32]

Subsets for e-commerce standards will be produced on the basis of more general standards in order to adapt applications to a certain industry, geography or for a certain type of purchase. It is often required that a subset be produced, since any international standards are far too content rich to be usable in practice.

4.2.1 Peppol – an EU project for increased cross-border e-commerce

Public procurements in the EU comprise roughly 17 per cent of the Gross National Product (GNP). The background to the Peppol (Pan-European Public Procurement Online) project is that public stakeholders belong to the largest buyers within the EU while at the same time they are far behind, for example, the large companies – when it relates to the use of electronic data communications with their suppliers. The problem that the project will assist the state players with is how they can make better use of and apply the benefits that are inherent in e-commerce and everything that follows from it, including, for example, e-invoicing, as well as managing the fact that, at present, no common standard exists for exchanging electronic messages.[33]

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,[34] 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.

In autumn 2009, the Swedish government decided that Sweden would participate in Peppol and that the Swedish central administrative agency under the Ministry of Finance is (ESV) should be the authority responsible for co-ordinating the Swedish partici-pation. Sweden has chosen to participate in that part of the work that involves e-invoices. The purpose of the Swedish participation is, among other things, to increase the use of e-invoices.[35] 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 e-invoicing and other e-commerce through solutions that are produced in the project in co-operation with solutions that already exist in Sweden.[36]

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 e-invoices is to bring about a European e-invoice framework that enables small and medium-sized companies to use e-invoices in an efficient manner in order to reduce their start-up and operating costs for e-invoices.

5. Internal challenges facing companies

Paying invoices electronically is still a big step for many companies to take. E-invoicing requires that there is an environment at the company where IT is used in such a way that it forms part of the company's way of doing business with other companies. The payment of invoices is handled in the company's business system. The business systems that exist on the market provide support for different processes and can be built up in order to support different types of processes that a company needs. The systems are package solutions and companies must stay within them if, for example, they wish to go over to e-invoicing. Studies have shown that payments with paper invoices can take between 30 and 120 days depending on whether any errors exist in any information or the invoice becomes stuck in a process at the company. With e-invoicing, the process can be more efficient and errors handled faster. The application and the motive for starting to use e-invoicing depends on a number of individual preconditions at the company. The internal barriers can often be the most difficult ones to break down.

At the same time, while for many companies it is a large step to take, it is also self-evident to many large companies that applying new technology rationalises their business processes. Even long before the Internet revolution, large companies were able to connect with their large suppliers via internal systems in order to handle ordering and inventories. Invoice handling can be organised in different ways within large companies. For many, it is logical to establish so-called Shared Service Centre (SSC) at a few locations that handle, among other things, invoices for several companies in several countries. An SSC is an independent unit within the organisation that performs services for the internal companies that are its customers. The services that are performed are of an administrative nature, for example the management of customer and supplier accounts, balancing the books and reporting, as well as HR. It takes time to become familiar with the requirements that are posed in order to be able to use e-invoices. For example, using an invoice sent as a pdf can be deemed to be fully sufficient for small companies.

Since a transition to e-invoices is a large change and investment for the company, the large companies that are committed to e-invoices work intensively on steering their suppliers to want to go over to e-invoices. The most extreme method is to have a requirement for e-invoices in order to be a supplier, however it is more common for a company to offer different types of technical solutions depending on the relationship they have with the supplier. One example is ABB, which offers a large range of choices for its suppliers for sending their invoices, while at the same time they have set up conditions based on what ABB's own system looks like. This is an example of how large companies are able to handle the many different solutions that exists today.[37]

Another example is Peab, which in the long run wants to stop accepting paper invoices. The company is making suggestions to suppliers and connecting companies closer together. On its website, Peab is informing new and existing suppliers of precisely which different possibilities exist for sending e-invoices.

In order for Peab to accept an electronically submitted invoice, a number of requirements are posed that must be fulfilled. The e-invoice must fulfil the legal provisions that exist for bookkeeping and VAT. In addition, the invoice must contain all obligatory information that Peab has specified in the form of a format specification (industry-specific standard) and Peab's specified requirements for labelling. In addition to these requirements, requirements are presented regarding the specific technical solution the supplier can choose in order to send the invoice. For companies that do not have these technical solutions themselves, Peab refers them to suppliers in the market that provide different types of services.[38]

The use by small and medium-sized companies of e-invoices is different, but no general picture exists. Many are suppliers to other, larger companies and their application of e-invoices affects the smaller companies. Many small and medium-sized companies work, first and foremost, on a national level, which in this case means that the problems that exist in cross-border use are not relevant.

6. Closing discussion and final conclusions

The use of e-invoices contribute to making national and international trade "paperless" and companies should therefore be able to save resources and rationalise their activities. The potential for increased use is large since the level today is quite low.

The use of e-invoices is still limited; even in countries that are quite advanced, e-invoices comprise slightly less that 10 per cent of all invoices submitted. A common solution for the EU should involve competitive advantages for all companies. In a well-functioning market, cross-border use of e-invoices is an important component. The most important thing for companies is to be able to make sure that the requirements that are posed by the tax authorities in an EU member state are clear. One important precondition for this is that the directive on a common system for VAT, with regard to the rules for invoicing,[39] be implemented in a uniform manner by member states. As it has appeared and does appear in the EU today, the requirements that are being suggested differ widely, and for the companies involved in cross-border e-invoicing, in the worst-case scenario, have to adapt to the systems of the 27 member states. In the long run this is not a sustainable situation and it risks becoming a large barrier to its increased use and possible savings for companies.

With a perspective of making the procedures concerning international trade simpler, faster and less expensive, a transition to e-invoices should contribute to simplifying business procedures. On the basis of trade facilitation, it is important that companies are easily able to find out precisely which rules and requirements must be followed in order for e-invoices to be able to be used as a flexible document in business processes between companies. The invoice is just one part of this process. However, in electronic form, a number of steps and tasks can be solved with one document instead of several.

One question that the National Board of Trade is asking itself, based on the barriers that exist, is whether the state can contribute to the simplifications. Creating better preconditions for the cross-border application of e-invoices is not an obvious task for the state. If two companies wish to use e-invoicing, an agreement can be made or the opportunity can be opened up via some other technical solution that exists today. What the state can do is, in an overall appraisal of other interests, in part facilitate the application by adapting and changing laws and regulations that comprise a barrier to companies and in part provide clear information about the laws and regulations that apply. When it concerns e-invoices, it is one example of an area where barriers and problems exist that sit outside a company's own control and ability to influence.

In its role as the policymaker, the state can participate and create good preconditions for, in this case, the application of new technology as a way of facilitating and reducing the administrative costs of companies for handling invoices.

On the basis of the earlier formulations of the VAT directive, it is important to make sure that member states do not interpret the information differently. It is important that Sweden continues to drive the issues that e-invoices and paper invoices should be treated the same without the requirements being raised for paper invoices. Nationally, Sweden can contribute through coherently looking at how other legislation can be changed so that it does not become an indirect barrier to the cross-border use of e-invoices. As an example, the work of implementing the new VAT directive should begin early so that companies will have the opportunity to adapt their procedures and processes to the preconditions that the new directive involves.

With the new wording of the directive on VAT handling during invoicing, better preconditions can be created, however, there exists a risk that it will continue to be difficult to use e-invoices in cross-border applications. Member states can become better at providing information on precisely which rules apply and also on attempting to find a more harmonised interpretation. Transparency is an important area, but deficiencies still exist today – both companies and consumers have difficulty obtaining information.

A common standard across industries and around the world for e-invoices is desirable, but the road is long and the responsibility of the member states is limited. In conclusion, it is important to highlight that there are many barriers to e-commerce that require co-ordinated efforts in several member states and at EU level. Within the EU there is, regardless, ongoing work based on different perspectives, for example the work with reducing the administrative costs for companies as well as the work with further developing and modernising the internal market.

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http://ec.europa.eu/enterprise/sectors/ict/files/
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Interviews with representatives from six Swedish-
based multinational companies.

Endnotes

1   EDIFACT is a standard for sending business messages, including invoices, via EDI. EDIFACT was created by UN/CEFACT and is used today by many companies. There are different industry-specific adaptations.

2   Electronic Invoicing Initiatives in Finland and in the European Union – Taking the Steps towards the Real-Time Economy, Helsinki School of Economics, 2.

3   Electronic Invoicing as a "keystone" in the collaboration between companies, banks and PA. Observatory on Electronic Invoicing and Dematerialisation. School of Management. Politechnico Di Milano. Report 2008.

4   www.nea.nu

5   EU countries' different requirements for electronic invoicing, http://www.nea.nu/images/NEA-dokument/efaktura/e-fakturastatuseu.pdf 2006-09-25.

6   Tax-compliant Global Electronic Invoice Lifecycle Management, Trustwever, October 6.

7   Within the framework of the study, some Swedish-based multinational companies were contacted to respond to questions concerning the use of e-invoices. The purpose of this was to obtain a picture of what the practice looks like and how large companies with comprehensive cross-border trade are addressing and using the opportunity for rationalisations that e-invoices involve.

8   Company information.

9   Company information.

10 UN/CEFACT's recommendation 6 describes, among other things, how the state as an issuer and recipient of invoices should contribute to their increased use by suggesting requirements and using internationally recognised standards when invoices are being sent and received.

11 UN/CEFACT Recommendation 6 Aligned Invoice Layout Key for International Trade.

12 Directive 2001/115/EC.

13 According to Article 2 in the Commission's recommen-dation, 1994/820/EC EDI is: electronic data interchange from computer to computer of commercial and administra-tive information through the use of one agreed standard in order to form an EDI message. An EDI message is: an integrated set segment that is structured as per an agreed message standard in a format that is readable by a computer and that can be transferred between and processed by information systems (computers) in an automatic manner.

14 Directive 2006/112/EC Article 233.

15 Final report of the Export Group on invoicing, 2009 http://ec.europa.eu/enterprise/sectors/ict/files/finalreport_en.pdf

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32 Final report of the Export Group on invoicing

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34 See www.peppol.eu

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36 www.e-fakturera.nu/nyheter/nyheterefakturering/esvsamordnarsvensktdeltagandeipeppol.5.1392f1e61249 11f26a58000375.html

37 www.abb.com

38 www.peab.com

39 Council Directive of 13 July 2010 concerning amendments to Directive 2006/112/EC on the common system of value added tax, with regard to rules on invoicing.

Annex 1

Table 1. Methods of e-invoicing

Type of solution	Short description
E-invoice	An e-invoice can be sent directly from the purchasers invoice handling system Innova to the seller's system, where the handling occurs electronically. The recipient has the most to gain from the solution since the registration of the invoice occurs automatically. An EDI invoice can be sent directly between two parties or via a third party, a so-called VAN operator.[1] There are different technical standards for e-invoices.[2]
Electronic invoice handling (EFH)	Electronic invoice handling, which concerns the internal handling of an invoice in an electronic workflow. Electronic invoice handling is based on IT support. EFH encompasses internal distribution of invoices, accounting, certification and archiving. EFH requires e-invoicing procedures or scanning and the conversion of paper invoices to an electronic format.[3]
The bank's invoicing solution (sole company)	Banks provide electronic invoicing both to private customers and to companies. Among other things, solutions exist that build on the users paying e-invoices themselves via their Internet bank. This solution can also be used for small companies. Large companies can choose to send their e-invoices to their bank in a file that is then handled and communicated to the purchaser's bank. For companies with many different counterparts, this requires a number of different agreements with an e-invoice intermediary in order to be able to receive and send e-invoices. The banks work by connecting together their e-invoicing solutions so that invoice issuers and invoice recipients will be able to reach each other with only one point of contact, regardless of the precise solutions that might be involved.[4]
Self-invoicing	The purchaser creates the invoice in its accounting system instead of the seller. This is not possible to use for all types of invoices, but rather only when it involves trading in goods or services where there are clear control procedures and an agreement between the parties.
Invoice by e-mail	An invoice is sent by e-mail as a PDF. There are systems on the market that can read PDF files and handle the information automatically, in other cases the handling must be done manually after the invoice has arrived with the buyer. The party sending the invoice saves the use of: paper, an envelope and postage, whereas the receiving party still has to perform manual handling. A PDF invoice involves, for the recipient, an absence of automated invoice handling, such as receiving, data entry, certification and accounting. This means it is able to delay what is probably most important for the issuer: being paid on time. In addition, sending invoices by e-mail means that it becomes more difficult, and sometimes impossible, to live up to the requirements that exist for accounting and archiving.
Value added services	There are a number of different suppliers in the market who offer different forms of services in order to facilitate invoice handling. VAN companies can be named as an example. They receive invoices in the sender's format and then convert them into the recipient's format. Invoices can also be sent in paper form if the recipient does not use e-invoicing and then converted into an e-invoice in the desired format. In addition, these suppliers can provide the service of adapting invoices to the rules and requirements that exist in the country where the recipient is. One further example is an exchange of invoices that is a service for the transmission of electronic invoices and other documents or scanned invoices in electronic format between buyer and seller. The seller uses this for the communication of customer invoices. The buyer uses it for the communication of supplier invoices. Other examples of value added services are conversion and archiving.
Web EDI	A web EDI is an EDI solution for the sender and an Internet solution for the recipient. The invoice is sent as an EDI invoice from the large company to an Internet-based solution where the recipient can handle the invoice.
Invoice portal	An invoice portal is a service where a supplier to an authority or company can register customer invoices using a web form, which is then sent electronically to the authority or company in a format that has been determined in advance.
Scanning of paper invoices	On receipt of a paper invoice, it is scanned to make an electronic copy that is handled in part manually and in part electronically in an invoice management handling system. Since all data in the invoice is found with interpretation, the scanning process is only of limited value. In order to do this, a scanning centre can be used or large companies can handle this internally.

[1]   VAN suppliers are companies that offer VAN services (Value Added Network), for example message forwarding.

[2]   Dykert and Fredholm 2004.

[3]   Implementation strategy for e-invoices, 2006-07-13, ESV.

[4]   Information from the Bankers' Association.