ELECTRONIC INVOICES AND PAYMENTS - LINKING THE VALUE CHAINS

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ABSTRACT:

This paper undertakes to analyse the possibilities created by introduction of electronic invoices into Polish legal system, and this is carried mainly from the view of implications this may have on small and medium size enterprises. The common opinions on the matter are quoted and analysed. The solution is proposed of how to find a way out of current stalemate, resulting from the adoption of strict requirement for the qualified electronic signature to be obligatory in any exchange of electronic invoices. This seems to be the main obstacle now to electronic invoices becoming popular in Poland. The proposed solution considers enterprises as members of value chains, and calls for the third party service to be introduced, based on the example of Norwegian system, which is in operation for almost ten years now.

KEYWORDS:
Value chain, invoice, electronic invoice, payments, electronic signature, small and medium enterprise

1. Introduction

The concept of value chains is not new to the theory of organisations. The term "value chain" is believed to have been coined by Michael Porter in his work [Porter_1985], which made him famous in the world of enterprise theory and practice. The value chain from Porter's perspective consists of a number of consecutively performed activities, building on results of each other, and arriving finally to a saleable product, which - still within the same value chain - becomes marketed and sold, engaging, in Porter's terms, outbound logistics, the final stage of the chain. What Porter regarded from the single enterprise point of view, nowadays can be seen as only a part of a bigger entity, like in [Kaplinsky_2003], where the similar concept of a "value stream" is quoted after [Womack_2002].[1] In Porter's terms a company may achieve a cost advantage either by reducing the cost of individual value chain activities or by reconfiguring the value chain. Womack and Jones in turn, see the value streams as a place where resources are converted into some value, but many of these resources are consumed (or even wasted), without bringing any significant value to the end customer.

One of the ways to reconfigure value chains with the aim of reducing cost without affecting the final product, is to apply technology [see: Hafner_2005, p.18]. And it is the information technology which today is present in almost every stage of a typical value chain. In many cases this technology acts also as a bridge between separate value chains (in Porter's understanding), or within value streams (as seen by Womack and Jones).

The case of electronic invoices (and electronically triggered payments resulting from them) constitutes a typical example of such a bridging technology. In July 2005 a law was passed in Poland to allow businesses to exchange invoices by electronic means

[1] This is also called „value system", as in [Hafner_2005]

[Dziennik_Ustaw_1119]. This has not been without controversy, since, in contrary to the solution adopted widely in the countries of European Union, Polish lawmakers decided to require the parties exchanging electronic invoices to use a qualified electronic signature to prove origins of such an invoice and its integrity. This certainly will not help in adoption of those invoices by business, and especially by Polish small and medium size enterprises. And it is these companies that create most of value chains present in industry and trade today.

2. Small and medium enterprises in Poland

There is no single definition available of small and medium enterprise (SME) category, which will allow comparing them worldwide. Many countries and organisations are using their own comparison criteria. E.g. OECD adopts in general the EU classification of SME[2], but uses its own criteria in its statistics and reports. Its classification is based on number of employees of an enterprise only, and even within this particular aspect, it is different than that of EU [see: Bankier_2005, and also OECD_2005, p.17].

Poland has adopted the EU rules for classification of SMEs, and made it a law by including it into the Economic Freedom Act of 2 July 2004 [Dziennik_Ustaw_1807]. The detailed criteria for micro, small and medium size enterprises are contained in articles 104 through 106 of this act, and are presented in Table 1.

Table 1

Classification of enterprises in Poland

Classification criteria*)	Size of the enterprise		
	Micro	Small	Medium
No. of employees	Less than 10	Less than 50	Less than 250
Annual turnover € million	No more than 2	No more than 10	No more than 50
Total assets € million	No more than 2	No more than 10	No more than 43

*) to be qualified as belonging to a given category the enterprise must fulfil one of the three criteria during one of the last two reporting years [Dziennik_Ustaw_1807]

Source: author's design based on [Dziennik_Ustaw_1807]

One can assume, all enterprises beyond the scale presented in Table 1, are categorised as large enterprises.

According to [Bankier_2005] report Polish sector of small and medium enterprises provides nearly half of country's GNP, while in fifteen "old" EU countries this is of approx. 60% of GNP [SAP_2004]. This meaningful role of SMEs in Polish economy does not reflect the level of IT solutions used by them. The scope and the role of IT in those enterprises are subject of research, carried since 2003 by Szkoła Główna Handlowa and Polish division of Microsoft Corporation. The results of this research are published as reports designed and compiled by Tomasz Kulisiewicz, a renown Polish IT expert and IT market analyst. Along with each report an index (MSI) is calculated, providing a synthetic indication of trends [see: Kulisiewicz_2004 and Kulisiewicz_2005].

[2] for details see Annex to [EU_1993/361/EC]

The latest report of that line (Spring 2006) was not publicly available at the time this paper was compiled, but its short review published in Computerworld weekly claims the MSI indicator stays at its historic maximum for the second quarter in a row. Despite this and similarly to what resulted from earlier research – 60% of companies analysed claim, they do not see the expenditure and effort put on information technology as bringing down their cost level or as increasing their income.[3]

This opinion might be subjective to the extent, but it is also a kind of warning, that the introduction of the very law on electronic invoices will not simply result in wide spontaneous adoption of this new opportunity for SMEs, as some sources attempt to claim.

3. Electronic invoices

The resolution of Polish Ministry of Finance on issuing and sending of invoices by electronic means [Dziennik_Ustaw_1119], in power since mid 2005, has become a source of numerous controversies, even before it became a law. The main reason for that was the requirement of using the qualified electronic signature to ensure the integrity of the invoice.[4]

This requirement finally became a law, despite it is out of line with EU regulations, which leave the subject of electronic signature to the decision of EU member states [see: EU_2001/115/EC, article 2][5]. One needs to consider also, that the [Engel-Flechsig_2003] report, which has a status of official CEN[6] document, clearly states that the standards related to a qualified electronic signature have not yet reached the maturity level expected by the EU commission, and that „*QES [Qualified Electronic Signatures] may be suitable for formal "one off" documents such as contracts, but could be considered as providing disproportionately high security in relation to most common business invoicing scenarios, as well as a very costly solution*"

The Polish requirement for the electronic invoices to be provided with qualified electronic signatures has serious implications, making significant obstacles to the process of invoice exchange using third party go-betweens. The solution of that kind is discussed later in this paper, as particularly suitable for the needs of small and medium size enterprises.

The Polish requirement can also result in problems while exchanging the electronic invoices with parties in the states with different regulations. For Polish companies it means the exchange of electronic invoices with their counterparts in the countries of the so called Old-EU would prove impossible. From among those states only UK and Finland allow for electronic signature to be used, but they are still not compulsory there.

There is similar requirement in France, Belgium, Spain, Ireland and Niderlands, but all those countries use a category of „advanced electronic signature" [see Engel-Flehcsig_2003, page 43]. The main difference between the two is, that the „advanced electronic signature"

[3] see: Szymon Augustyniak, *Więcej IT w MSP*" (More IT in SMEs), www.computerworld.pl, 10/3/2006

[4] this, not without help of some media, created another misunderstanding, since electronic signature in this case does not substitute a hand written signature; throughout the EU (hence also in Poland) there is no requirement for invoice to be signed (requirement for this has been abolished in 1977, see [EEC_77/388, page 63]; possible misunderstandings likely to result on this basis are discussed also in [Engel-Flechsig_2003, page 43]

[5] similar view has been expressed also in numerous comments in Poland

[6] CEN – Comité Européen de Normalisation

allows to use signature certification services from beyond the official, dedicated structures, while complying with rules adopted by the latter. Example of this could be the service granted within a group of companies.

However, if to leave aside, for a while, the requirement discussed here, it looks that most opinions expressed on the subject regard the very possibility of sending an invoice via electronic means, as a significant convenience and a source of meaningful effects.[7]

In reality however this solution, as it is available now, puts at the disposal of the parties involved (seller and buyer) only the form of transport alternative to used for paper documents. And the only direct effect of this could be the shortening of the time period between the moment the invoice is sent and received. The indirect effect, like saving on paper and postage, has only a significant meaning when the seller issues and sends huge number of invoices, each of which calls for relatively small value.[8]

The shortening of invoice transportation time (currently, for domestic letters, this is of approx. 2-3 days) would mean something at all, if it would speed up the circulation of goods and money, provided however, the buyers would feel obliged to pay their invoices earlier. Nevertheless, if the invoice itself does not indicate to the contrary, the law requires the buyer to pay the invoice "without delay" (article 455 of Polish Civil Code). This, in turn, according to the resolution passed by Supreme Court on 28 May 1991 (II CR/623/90) means "within 14 days" since the request for payment, and the invoice has been received by buyer. The same Supreme Court however in its another verdict of 19 May 1992 (III CZP, 56/92 OSNCP 1992/12, pos. 219) has stated, that the invoice has also the role of payment request, only when the requested conditions and date of payment, were explicitly expressed in the invoice itself.[9]

It is clear, then, that faster delivery of the invoice does not affect the payment date expressed in it. And that leads to the conclusion, that sending an invoice by electronic means, does not affect the process of money circulation. Hence, in the conditions prevailing among SMEs, there is little, if anything, to be gained from only changing the means of transportation of invoices, and that seems to be the main reason that the interest of businesses in this solution is very limited indeed.

4. Invoices in SMEs

The invoice has a number of functions:

- It is a formal declaration the delivery has been made, or the service accomplished,
- Could have the role of payment request[10]
- Contains various state required information, on related duties like taxes, customs fees, excise etc.

[7] e.g. the "*Rzeczpospolita*" daily of 16 February 2006 has published an article on electronic invoices "*Small companies rarely reach for easements*", assuming in advance and automatically, that an electronic invoice has an advantage over traditional invoice; the same approach is taken by "*Gazeta prawna*" daily ("*The companies are afraid of e-invoices*"), which jumps to the conclusion that this results only from poor knowledge of facilities offered by electronic invoices solution

[8] the sellers of that kind, e.g. telecom operators or energy suppliers are paying lower postage, since they negotiate their tariffs with Post Office individually

[9] see: [Izdebski_1997] and also archives of Poznań Accoutning Services Bureau (http://uzr.com.pl)

[10] see the deliberations on High Court verdicts above

The scope of information the invoice must carry is defined within the appropriate legal regulations, there is however no issuer's signature among them.[11] Te law does not regulate precisely the layout of invoice information. This does not affect the contents of the invoice, but this could be a factor limiting suitability of the invoice to automatic conversion from paper to electronic data other than its picture. A seller may issue the invoice in hand writing, or by machine means. The latter could mean typewriter, computer text editor or specialised computer program, or the integrated IT system.

The order above – from manual methods through to integrated systems, reflects also the growing level of automation of the activities involved in the act of issuing the invoice. Of all methods considered, only the integrated system allows for performing all possible account postings, changes to warehouse registers, along with the issue of invoice, allowing also for triggering actions necessary to replenish stocks, and reflecting the data necessary in reports and statistics.

The invoice issue from system other than integrated does not result in all those automatic functions, which are then performed manually, or are based on a manually initiated transfer of data between systems. What's important – the integrated systems are also provided with a capability of exchanging data with banking systems, and that allows also for automation of control of payments due, early reporting and managing threats to liquidity etc.

This whole process looks somehow similar from a buyer's perspective. The invoice data, regardless of how the invoice has been issued by a seller, must finally reach the accounting registers of the buyer. In most cases the data in question are input manually, while their posting to the proper accounts is performed more or less automatically, using computer systems.

In some cases the sellers, in order to force a quick and ensured payment of their invoices enter agreements with the organisations specialising in so called factoring operations. Factoring, in a sense (and put simple), is a kind of trading on payments due. The factoring organisation (The Factor) pays the invoice immediately, in exchange for taking on all the rights and obligations resulting from that invoice, for what it charges the fee, covering its service and risk.

In small enterprises the invoices are usually issued with specialised computer programs, which are available on the market. Simple program of that kind can be purchased for the amount of approx. PLN 150 – 200.[12]

Such simple programs do not allow for import of invoice data from other systems, and they are usually not capable of exporting their data for further processing in other systems.

One can risk a thesis, that the scope of functions, and the level of complexity of invoicing programs used, grows in some proportion to the size of the enterprise, in which they are employed, reaching the level of integrated systems in large enterprises, and also in very limited number of medium size companies. This assumption gets confirmed, when looking on the data on implementation of IT systems, which are dedicated for small enterprises (see Table 2). This table shows the Polish SMEs mostly use COTS software with unit price not exceeding PLN 1000.

[11] the detail enumeration of these is given in chapter 4 of [Dziennik_Ustaw_798]
[12] e.g. that is the list price the program called "Mikrosubiekt dla Windows" by Insert Company

Table 2. Implementations of IT systems in SMEs in Poland by system manufacturer

Manufacturer of software	Number of implementations (thousands, as per end of 2002)
Insert	163
WA PRO	60
CDN (ComArch)	43
dGCS	42
Matrix	21
Graf Soft	20
Kamsoft	15

Source:DiS Reserach, 2003

Assuming that even all IT systems offered by manufacturers quoted in Table 2 will soon become adapted to handling electronic invoices, it would not mean their users would be capable of implementing solutions of that kind, in an easy and profitable way.

SMEs are significantly different than their large counterparts, not only by scope of using IT, but also by the way IT is used there. To some extent, this results from historic reasons, but – in an equal range – this reflects also the nature of operation of an SME. Since it is usually relatively small in size, and it has small number of employees, it becomes managed in a less formalised way. It can also, easier and at a lower cost, adapt to changing market demand.

The IT systems used in SMEs are selected and implemented in a cautious manner, and only when it is required by law (i.e. enforced on them)[13], or when such an implementations is very likely to result in quick and significant effects (e.g. lowering of direct labour effort). For the latter reason usually the invoicing system is the first IT solution implemented in those enterprises. Later on, widening the scope of automation, these systems evolve into warehouse inventory systems, or into financial and accounting systems.

In most SMEs that way of implementation of IT solutions results in distribution of IT services between various systems, in many cases originating from different suppliers.[14]

5. Electronic invoices in the value chains

In most cases SMEs are playing the role of suppliers and buyers, members of long chains of flow of value, with large and very large companies at the end. The latter, exploiting their dominant position, are capable of imposing the adoption of IT systems upon their SME

[13] the "Patnik" system, enforced on all business and administration in Poland by the ZUS (Nationwide Pension and Helath Insurance Organisation) is a good example of it; it is available in MS Windows version only

[14] to the extent this has been caused by the suppliers of integrated system themselves, since for a long time they concentrated on large and very large enterprises, and only after that segment became saturated, they turned to solutions for smaller companies (see: www.sap.pl)

partners, just to suit their own interests. This provides some benefits to the large, leaving to the smaller to bear the cost involved.

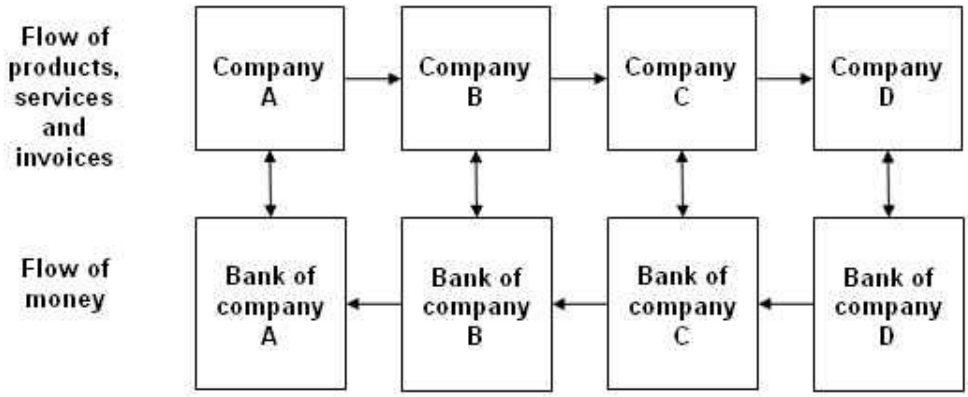
Bearing that in mind, one can say that the opinions, which limit the results from switching to electronic invoicing to simple savings only, are superficial and, at the same time, seem to show astonishment by the fact that no one is eager to reach for these savings.

It is so despite experts saying the real reasons of that approach are more complicated, and should be sought for somewhere else.[15]

The example chain of value flow links, within which in one way flows the stream of goods and services (and – along with them – the related invoices), while in the opposite direction, flow the stream of money, is shown on picture 1.

Picture 1.

Simple value chain and the flows related



Source: authors design

The possible gains, likely to be achieved by using electronic invoices, within the value chain presented in picture 1, must be perceived wider, also in connection with the flow of payments. That means not only the exchange of electronic invoices, but also – and also electronic in the best case – exchange of documents with the banks. Such systems, within which all participating partners are operating to the strictly agreed formats of data exchanged, are used worldwide since mid-60s.

Systems of that kind, called Electronic Data Interchange Systems (EDI), are relatively inflexible, and require all participants to use software and hardware and telecommunications infrastructure, which to the extent, is closed. For that reason, even when employing Internet as a means of transport, solutions of that kind are expensive and unsuitable for SMEs [see also Fu_1999].

[15] the supplement "*Dobra firma*" (A Good Enterprise) nr 53, to the "*Rzeczpospolita*" daily of 3 March 2006, in an article „*Nie chcą płaci dużo i narażać sie fiskusowi*" (They do not want to pay much, and to tease tax authorities) says, that a single electronic invoice can provide savings of PLN 2 - 3, adding that with 30 invoices per month the cost of implementation will be higher than possible gains from it; a renown Polish IT expert and chairman of the TI Consulting company, Wiesław Paluszyński, in the short interview published along with the said article, says that there are a number of cases of imprecise law, and also many legal, formal and systemic omissions, which, in Paluszynski's opinion, associate electronic invoices mainly with feeling of fear and risk and not with anything to be gained

The EDI systems can provide a much wider scope of service, going beyond invoices and payments related to them. Usually those systems constitute a composition of complex links and interactions, within which the co-operating parties mutually exchange their production plans (based on electronically received orders), and plans for purchases of raw materials and components. Staffing information and production lines and machines load are other examples of information of that nature.

The function of that complexity can only be performed properly by a system of very high level of internal integration, and closely integrated with partners' systems, and, at the same time, supported by well established procedures, which control the operation of the enterprise as a whole. All those make such a system highly efficient, however for a price of flexibility. That, along with the cost, makes those systems unsuitable for SMEs.

6. The Norway Post Office invoice exchange service

Bearing in mind the complex value chains consist of enterprises of various sizes, of different scope and scale of operation, one can easily come to the conclusion, those enterprises use various invoicing methods and techniques – traditional and electronic. The latter may cover EDI or other methods available. The parties taking part in it are linked by various rules of co-operation, which can not, without significant effort and expenditure, be changed, or adapted to new, wider requirements.

In that light there is a need of a kind of service, capable of performing the exchange of invoices of any shape and format, between all existing and future participants of such a process, while not forcing them to invest into full IT infrastructure required.

That kind of service is offered by Norwegian Post Office (Posten Norge[16]). The architecture of their system is presented on picture 2. The service they provide is universal in nature, and it adds value by converting the formats of invoices, not excluding those in paper form. The format preferred and shape of invoice for each user registered with the system is recorded in its customer database, which tells it about what exact format is suitable for invoices of any particular user. The service in question, named eFaktura, is being offered by Norwegian Post Office as based on its extended EDI services, which it provides for nearly 10 years now.

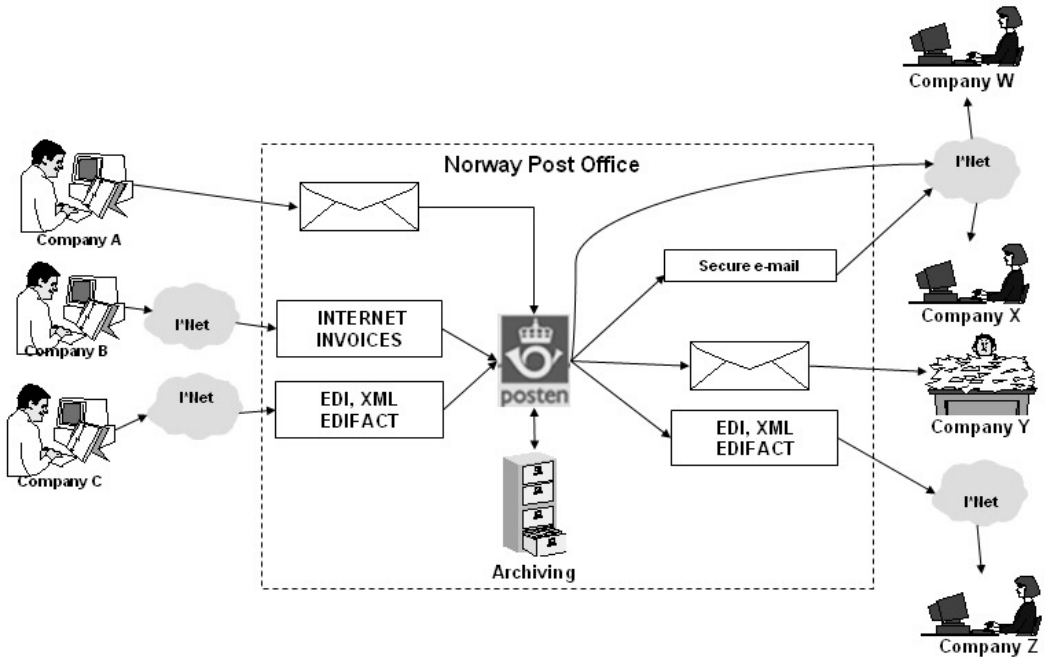
The eFaktura system not only does convert one kind of electronic invoice into another, but serves also paper invoices. These, when received, are converted to electronic form, and supplied to the receiver in the format required, and vice versa – the Post Office prints out the invoices received electronically, and delivers them via standard postal delivery services to the users of the system requiring that.

The users are charged for the service performed for them. According to Norwegian Post Office, the user of the system can reach savings of 30 – 50%.

Coming back to the deliberations on invoices in value chains, one can say the service as provided by Norwegian Post Office is exactly what Poland lacks, and what, if implemented also in Poland, would allows users to enjoy a swift exchange of electronic invoices without spending anything on the IT infrastructure of their own.

[16] www.posten.no

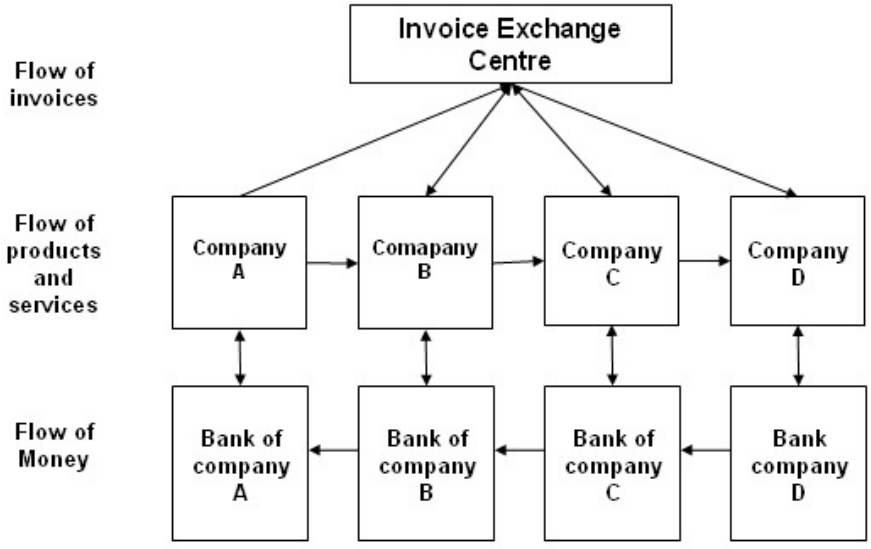
Picture 2. The architecture of an invoice service of Norwegian Post Office



Source: authors design based on [Engel-Flechsig_2003]

After applying the facilities available in a Norwegian system to the scheme of value chains and payments from picture 1, it converts into what is presented on picture 3.

Picture 3. The value chain with central invoice exchange



Source: authors design

The system shown on picture 3 may be further extended with services provided by factoring organisation, and in this case the possibility to exchange invoices and other payment documents becomes obvious.

Having these facilities available one could go even further and attempt to serve also the flow of manufacturing floor documentation, like production plans and orders, exactly as large enterprises do it, using EDI. That would enable the SMEs to use, on their level of requirements, the organisation system based on “Just in Time” principle, available now – due to high cost and organisational regimes – to large enterprises only.

The Norwegian solution seems to be almost natural extension to the possibilities of invoice exchange, created in Poland by the Resolution of Ministry Finance [Dziennik_Ustaw_1119].

The service in question could be provided in Poland by e.g. National Clearing Chamber, an organisation with wide experience in exchange of payments between banks, and also in computer processing of mass paper documents. The service could be also provided by one of service companies, well experienced in providing an EDI service, like ComArch.

This however can not be accomplished in current legal situation, since Polish regulations do not clearly state, whether an once signed electronic invoice can be re-signed again by an intermediary, who does conversion of the invoice from one format to another. It seems that in contrary to the e-invoicing regulations of the Old EU states, which are open to inevitable future developments, the Polish regulations are inflexible and suitable only for current needs. By their excessive restrictiveness they will make it difficult to develop of value chains on the EU-wide scale.

One can be sure, that availability in Poland of a solution similar to the one used in Norway, would become a real factor not only speeding up the process of introduction of electronic invoices, but – most of all – allowing for gaining significant savings on that.

7. Close

This paper presents the concept of making the electronic invoices more popular or – in a wider sense – to enable for exchange of other documents and information flowing in both directions within value chains. The solution proposed here does not need any investment in proprietary IT infrastructure of prospective users of the system. The costs imposed on them would only be a function of intensity of usage of the system, what makes this solution especially suitable for small and medium size enterprises.

The concept presented here can be perceived from the classical value chain perspective, as it is understood in [Porter_1995], where it reflects mainly the purchase – manufacture – sell model. One can also relate it to the more modern views on value chains, like those presented in [Kaplinsky_2003], where the beginning of such a chain coincides with the product design stage. One can go even further and apply to this research the concept of "value strems", as presented in [Womack_2002].

There seems to be no doubt, electronic invoices will find their place in Polish economy, and one can hope this will be after all done in a way allowing for easy, cheap and straightforward exchange of electronic invoices, both - domestic and international. The enterprises of today, whether small or large, must realise they are parts of multiple chains of co-operation. As Martin Haffner says in his [Haffner_2005] work: "*Clearly, a firm's success in developing and sustaining a competitive advantage depends not only on its own value chain, but on its ability to manage the value system of which it is a part.*"

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