

# Electronic Invoicing as a Platform for Exchanging Accounting Information

– The Electronic Accounting Reference Concept

Esko Penttinen

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## Executive summary

The objective of this white paper is to promote the use of electronic accounting references. The use of the electronic accounting reference is seen as a natural next step in electronic invoicing, further automating the processing of incoming invoices at the buyer site. In this white paper, we put forward the concept of electronic accounting reference, outline the alternatives for handling electronic accounting references in different types of invoices, discuss the benefits of electronic accounting references, and propose avenues for further development in this area.

We propose an electronic accounting reference which is a row-level identifier created by the buyer. The reference length is limited to 35 digits and does not allow for the use of separation marks. The buyer may choose to include various accounting dimensions in the reference (cost pool, project number etc.), provided that they fit into 35 digits. The fields for transmitting the electronic accounting reference in the most commonly used Finnish message descriptions are Account\_Reference in TEAPPSXML 2.7.1 and AccountDimensionText in Finvoice 1.3.

Electronic accounting references can be used by the buyer to automate the process of posting invoice data into the accounting systems. The use of electronic accounting references results in several benefits for both trading parties. We have categorized these benefits into (1) increased process efficiency, (2) improved customer service, (3) enhanced control and speed. We discuss these benefits in greater detail in the paper.

The challenges of implementing the electronic accounting reference are mainly two-fold. First, the accounting reference needs to be communicated from the buyer to the seller so that the seller can insert this information on the invoice. There are several alternative solutions for doing this for different kinds of invoices. We will discuss these solutions and provide a case example of one company that has implemented the system successfully. Second, there are technical challenges: the limitation to 35 digits and the lack of support by some of the current financial administration software. We strongly encourage the software vendors to consider adding the functionality of handling electronic accounting references in their software.



## Introduction

This white paper reports the findings from case studies and interviews made on the use of electronic accounting references. The electronic accounting reference makes it possible to process the incoming invoice automatically by the buyer, thus eliminating unnecessary manual steps in the processing of incoming invoices. This, in turn, translates to lowered invoice processing costs and to fewer errors.

The electronic accounting reference is a sub-project in the "Fully Integrated Accounting" project which is the third step in the Real-Time Economy (RTE) program. The RTE program is a four step, five-year development program (see Figure 1) geared towards increasing the efficiency of financial administration processes. The program was set up in collaboration with Tieto and Aalto University School of Economics<sup>1</sup>. It was initiated in 2006 by Tieto and will run until 2011. In the first steps of the program (Full SEPA and Full Value Chain), from 2006 through 2008, the focus was on electronic payments and electronic invoicing. In 2009, the focus of the program moved further to integrated accounting systems. Therefore, Aditro<sup>2</sup> was chosen as a partner in the Fully Integrated Accounting (FIA) projects along with Tieto. Aalto School of Economics has been responsible for the research initiatives in the program from its conception in 2006.

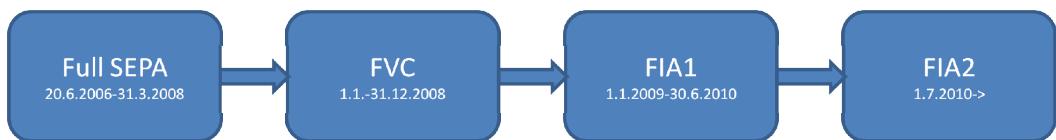


Figure 1. Steps in the RTE program

The overall objective of the RTE program is two-fold. First, the objective is to promote the use of existing electronic tools in the financial administration. These tools include, e.g., electronic invoices, electronic archiving of business documents, electronic ordering, and electronic payment systems. Second, the aim is to innovate totally new ways of making financial administration more efficient. Creating a common reporting account scheme in Finland and promoting the use of electronic accounting reference fall in this category. For further information on the RTE program, we refer the reader to the websites [www.hse.fi/rte](http://www.hse.fi/rte) and [realtimeeconomy.net](http://realtimeeconomy.net).

This document is organized as follows. After this introduction, in the second section, we go through the process of posting accounting information to incoming invoices and discuss how the move from closed EDI-solutions to open-standards pave the way for scalability and network effects in the use of electronic

<sup>1</sup> Tieto is an IT service company providing IT, R&D, and consulting services. With approximately 16,000 experts, Tieto is one of the leading IT service companies in Northern Europe and one of Europe's leading electronic invoicing vendors. The Aalto University School of Economics is the largest and leading business school in Finland with about 4,000 students and over 600 researchers, teachers, and service personnel.

<sup>2</sup> Aditro provides IT-driven outsourcing solutions, business process consulting and IT solutions for financial management, HR and information logistics. Aditro is one of the key players in the field of accounting systems in Finland.

invoices and electronic accounting references. In the third section, we present the electronic accounting reference concept and how it can be used in different types of invoices. In the fourth section, we present the case ALD automotive to give an illustrative example of a company that has created a service through which they can provide their customers with an electronic invoice containing the necessary accounting information. In addition, they are able to provide rich reporting tools to the customer. In the remaining sections, we discuss the challenges of implementing electronic accounting references and suggest avenues for tackling these challenges.

## Setting the scene: accounting reference in processing incoming invoices

The electronic accounting reference is used in the processing of incoming invoices. A typical process (see Figure 2) begins at the arrival of the invoice at the door of the buyer organization regardless of the method of arrival (such as traditional post, e-mail, fax, electronic invoice etc.). Once the invoice arrives, the accounts payable clerk must ensure that the document is indeed an invoice and forwards it to the responsible person for that particular invoice for content approval. This is normally the person who has placed that order. If there has been a purchase order involved when placing that order, the invoice must then be matched against the purchase order to ensure that the amount invoiced is correctly stated on the invoice. If the amount is right and corresponds to the goods or services delivered, the responsible person will have to approve the invoice by signing it off. Once the invoice has been approved, the invoice is posted into the accounting system. Posting information is needed to complete this step. Posting information can include, for example, general ledger account number, cost pool information, project number, VAT code etc. Finally, the invoice can be put forward to payment.

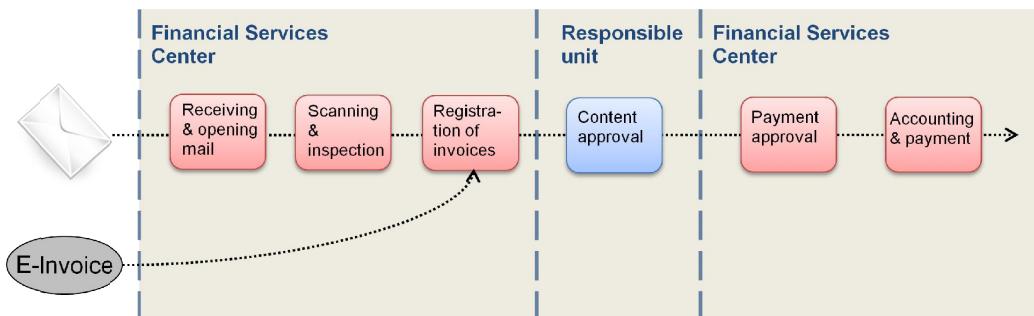


Figure 2. Processing incoming invoices

Technology has long enabled the content approval step to be done electronically: organizations have implemented information systems which allow the electronic transfer of invoices between the different units in the organization (e.g. between the financial services center and business units). What is surprising is that the most common method of exchanging the invoices between the buyer and the seller is still a paper invoice via traditional postal service. Exact volume data on the different forms of transmitting invoices are not available but according to many studies, although electronic invoices are gaining ground

rapidly, around 90% of all invoices are still in paper format in Europe and US. For studies on electronic invoicing market status updates, we refer the reader to the reports by Billentis, Innopay, and Swift<sup>3</sup>.

The incoming paper invoices are typically converted into electronic format by the buyer. This can be done by scanning the invoice's image into a text searchable document. Even though the scanning process is more efficient than typing the data on the invoice manually to the invoice handling system, the scanning process is highly sensitive to errors in the scanning procedure. Therefore, organizations need to verify the result of the scanning. The scanning and verification processes consume time and technical resources (scanners for performing this task are very expensive). A step further in making the process more efficient is the use of electronic invoicing. There are obvious benefits of getting the invoice data transmitted in structured, electronic format between the buyer and the seller. Electronic invoicing eliminates manual intervention and errors in this process and generates processing cost savings. An electronic invoice that arrives at the organization can be sent to content approval instantly, making the workflow more efficient in the invoice handling department. Naturally, there are positive environmental effects as well<sup>4</sup>.

## Electronic invoicing based on XML standards paving the way for scalability

Invoice data was transmitted electronically between trading partners already in the 1970s through EDI systems using proprietary standards. More recently, the Internet, facilitated by the development of open standards such as the TCP/IP and XML, has steadily become a popular platform for interfirm coordination<sup>5</sup>. Internet-based systems, as exemplars of open-standard interorganizational linkages (IOL), are widely regarded as one of the most significant IOL innovations. Recent developments in technology have enabled companies to move from the EDI (electronic data interchange)-based, highly partner-specific, point-to-point IOL to the open-standard, less partner-specific network models using XML<sup>6</sup>. The following table (Table 1) depicts the differences between EDI vs. open-standard IOL.

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<sup>3</sup> Billentis (2010). E-invoicing / e-billing in Europe – Taking the next step towards automated and optimized processes, Innopay (2010), E-invoicing 2010 European Market Guide. SWIFT (2008), SWIFT e-invoicing consultation.

<sup>4</sup> For studies on the various benefits of implementing electronic invoicing, we refer the reader to our website at [www.hse.fi/rte](http://www.hse.fi/rte) -> publications.

<sup>5</sup> Shapiro & Varian (1999). *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, Boston.

<sup>6</sup> Zhu, Kraemer, Gurbaxani & Xu (2006). Migration to Open-standard Interorganizational Systems: Network effects, Switching Costs, and Path Dependency, *MIS Quarterly*, vol. 30, August 2006.

EDI versus Open-standard IOL		
	EDI	Internet-based IOL
Content platform		
Data standards	Open standards (e.g. ANSI X12, EDIFACT), but less open than XML	Open standards (XML-based standards, ebXML)
Complexity	High	Low
Customization	Highly partner-specific	Less partner-specific
Delivery platform		
Communication protocols	VAN (private)	Internet (open, TCP/IP based)
Interoperability	Low	High
Communication costs	High	Low
Trading partner base		
Scope	Relatively narrow, with existing partners	Broad, with existing and new partners, hence strong network effects

Table 1. EDI vs open-standard IOL<sup>7</sup>

Electronic invoicing is a typical example of a technology that enjoys significant network effects. The network effect theory posits that the benefits that adopters derive from joining the network are positively associated with the size of the network. Network effects are both direct and indirect. An example of direct network effects is the positive impact of the number of adopters of electronic invoicing on the benefits that an individual adopter can achieve by enabling the exchange of invoices with a larger number of business partners. An example of indirect network effects is the increase in the number of compatible software and hardware solutions as the open standard diffuses. Naturally, the diffusion of open standards in the field of electronic invoicing contributes to the scalability of electronic invoicing systems and also to the use of electronic accounting references.

Since the early days of IT-based IOL, the challenge has been to onboard the smallest trading partners. In practice, large companies have a long tradition of enforcing their smaller trading partners in exchanging business documents in electronic format, especially in the EDI era. Despite these efforts to persuade SMEs to join the digital exchange of documents, the uptake of electronic exchange of documents among SMEs still remains relatively low<sup>8</sup>. The move from EDI-based solutions to open-standards is especially interesting from the point of view of SMEs as these solutions enable the SMEs to exchange business documents electronically with all the trading partners, not just point-to-point connections with some of the large customers, for example.

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<sup>7</sup> Zhu, Kraemer, Gurbaxani & Xu (2006). Migration to Open-standard Interorganizational Systems: Network effects, Switching Costs, and Path Dependency, MIS Quarterly, vol. 30, August 2006.

<sup>8</sup> Teo, Wei & Benbasat (2003). Predicting intention to adopt interorganizational linkages, an institutional perspective. MIS Quarterly, vol. 27, March 2003.

## Electronic accounting reference

Electronic accounting reference is inserted onto the electronic invoice by the seller on invoice level or on row level. This is to automate the posting of incoming invoices to accounting systems at the buyer site. Why should the seller perform this function on behalf of the buyer? The role of services is accentuated today's business<sup>9</sup>. Companies are aggressively searching for ways to provide value-adding services to their customer companies. The reasons for this lie mainly in the search for differentiation and in generating additional revenues. Typically, in shifting from products to services, a supplier does more for the customer than it used to and thereby allows the customer to off-load some work<sup>10</sup>. This resonates well with the electronic accounting reference concept as the seller is taking over some of the buyer's accounting tasks. Adding the electronic accounting reference to the invoice is a way to provide better service by the seller to the customer. We will illustrate this with a case example in the next section (ALD Automotive).

In Finland, the most common electronic invoicing message descriptions are TEAPPSXML and Finvoice. Both of these support the use of electronic accounting reference. The fields reserved for transmitting the electronic accounting reference are

- Account\_Reference in TEAPPSXML 2.7.1
- AccountDimensionText in Finvoice 1.3

The electronic accounting reference is created by the buyer and can include several accounting dimensions (such as general ledger account, cost pool, project number etc.). Length of the reference is limited to 35 characters, no separator marks are allowed.

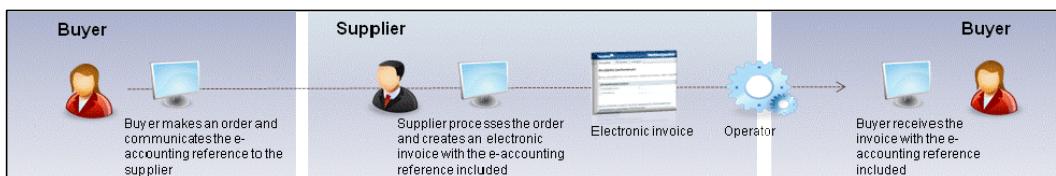


Figure 3. Electronic accounting reference

Exchanging accounting information on the invoice is not something totally new. Current real-life examples of the inclusion of accounting information on the electronic invoice include e.g. contract-based invoicing such as telecom and leasing. However, these practices in different organizations vary greatly in terms of, for example, the form of accounting information and field used in the electronic invoice message descriptions. The aim of the electronic accounting reference concept is to harmonize these practices. We will next take a look at the current examples of using electronic accounting references.

<sup>9</sup> Vargo & Lusch (2004). Evolving to a New Dominant Logic for Marketing. Journal of Marketing, vol. 68, January 2004.

<sup>10</sup> Kramer et al. (2005). Breakthrough ideas for 2005. Harvard Business Review, February 2005.

## Current examples of using electronic accounting references

To assess the current use of transmitting accounting information on the electronic invoice, we did a small scale study by conducting interviews in 16 companies (seven software providers and nine user companies). We asked the respondents whether they received or sent accounting information along with the invoice. We also asked what kind of accounting information (general ledger (GL) account, cost pool, project number, other accounting information) and in what fields in the electronic invoice message description (different fields in TEAPPSXML and Finvoice as well as other message descriptions). We also asked about their volumes and whether the information was on row level or on invoice level. If the company did not send or receive accounting information, we asked them to specify why.

On the receiving side, six respondents reported that they receive accounting information on the invoice. In case of outgoing invoices, four respondents informed that they send accounting information to their customer companies along with the invoice. Those companies that did not transmit accounting information cited "customers have not asked for this" and "we do not consider it necessary to get accounting information along with the invoice from our suppliers" as reasons for non-use.

What accounting information then was exchanged between the trading partners?

- The most commonly cited accounting information were cost pool and project number information (internal accounting information)
- Three respondents informed that they transmitted GL information
- None of the respondents (9 user companies) exchanged VAT information

We asked the respondents to specify in what fields they transmitted the accounting information. The companies named three different fields in the Finvoice message description and two in the TEAPPSXML.

- On the Finvoice message description: ShortProposedAccoutIdentifier, AccountDimensionText, RowAccountDimensionText
- On the TEAPPSXML message description: DIMENSIONS/DIMENSION, CREDIT\_ACCOUNT

To conclude from this small scale study, several companies are exchanging accounting information on the electronic invoice. Mainly internal accounting information such as cost pool and project number information is exchanged, but also in some cases GL accounts. The practices vary greatly in terms of the form of accounting information, field used in message descriptions, and whether they communicate several accounting information in one field or use multiple fields for transmitting accounting information.

Generally, lack of common practices was seen as a hurdle and most interviewees welcomed harmonization and standardization of the practice of transmitting accounting information electronically. One amusing story from one of the interviews was that the company did not have a field in their CRM system for maintaining accounting information. They picked a non-used field for adding this information. The field was the customer's telefax number.

## Electronic accounting reference in different types of invoices

The type of the invoice in part defines the way how the accounting information is typically processed. Here, we categorize the invoices into order-based invoices, contract-based invoices and non-order-based invoices. Next, we discuss how the electronic accounting reference comes into play in each of these categories.

Order-based invoicing	Contract-based invoicing	Non-order-based invoicing
<ul style="list-style-type: none"><li>Buyer communicates the accounting reference to the supplier on the order → supplier provides the accounting reference on the invoice</li></ul>	<ul style="list-style-type: none"><li>Recurrent invoices (e.g. telecom, insurance, leasing) → supplier can maintain the buyer's account chart and insert the accounting reference on the invoice</li></ul>	<ul style="list-style-type: none"><li>1) One-time, occasional invoices (e.g. miscellaneous purchases, Internet) → accounting reference on the invoice</li><li>2) Credit card invoices → accounting reference added to purchased items</li><li>3) Self-billing (no need for accounting reference as the invoice is created by the buyer)</li></ul>

Figure 4. Electronic accounting reference in different types of invoices

### 1. Order-based invoicing

In order-based invoicing, the buyer makes an order to the supplier electronically and a copy of the purchase order can be found in the buyer's ERP system. Generally, when making a purchase order, the buyer and the seller agree upon, e.g., the following terms: good/service to be purchased, delivery information (time, method etc.), payment method, terms of payment, and other invoice information (address, reference information, contact persons, account information). In addition to these data, the buyer can communicate the electronic accounting references for each row item to be included onto the invoice to the supplier on the order.

Currently, many companies use automated matching systems for the order-based invoices so that the incoming invoice is matched to the order using, e.g., the order number. Therefore, the relative advantage of the electronic accounting reference lies in the processing of non order-based invoices. In larger companies, the tendency is to increase the level of order-based invoices due to the enhanced control and transparency. The percentage of order-based invoices is often a key performance indicator for supply chain management.

## 2. Contract-based invoicing

Contract-based invoicing refers to invoices that are recurrent (often monthly or yearly) invoices and are contractual in nature. Invoices that are based on contracts typically include a small set of alternative row item identifiers. In addition, contract-based invoices usually contain large amounts of row items. Examples of contract-based invoices include telecom and leasing invoices.

Due to the characteristics of these invoices (recurrent nature, small number of alternative row level identifiers, large amounts of data), the supplier can maintain a chart of the customer's accounting information and simply attach the accounting information to the row level items on the invoice. In the next section, we will give a real-life example of a company (ALD Automotive) that has been able to create competitive advantage and to improve the level of service given to their customers by creating this kind of a solution.

## 3. Non-order-based invoicing

The third category of invoices contains other than order- or contract-based invoices. These invoices can be one-time purchases, credit card invoices, and invoices that are created by the buyer.

- One-time occasional purchases

One-time occasional purchases refer to goods and services that are purchased by the company sporadically and without ordering being placed in ERP systems. Examples might include non-planned service visits and irregular purchases from web stores.

Concerning the electronic accounting reference, the buyer can communicate the accounting reference to the seller when making the purchase through phone or an Internet store website. For doing this, the seller should have the capability to add the electronic accounting reference to its sales order.

- Credit card invoices

Company credit cards are used to make various purchases by the employees of the company. Credit card invoices are a type of invoices that often cause unnecessary manual work in the processing of the incoming credit card invoice. This is especially the case for small companies who have outsourced their invoice processing to accounting firms.

When making credit card purchases, the cardholder indicates consent to pay by signing a receipt with a record of the card details and indicating the amount to be paid or by entering a personal identification number (PIN). Concerning electronic accounting references, the credit card company can offer a possibility to add the accounting reference via an Internet service after the purchase has been done.

- Self-Billing

In self-billing, the buyer issues the invoice to herself and sends a copy of the invoice to the supplier with the payment. The buyer can create the invoice, for example, according to the consumption level the buyer is taking out of a vendor-managed inventory stock. Examples of self-billing might include MRO parts business and recycling material business. Here, the notion of electronic accounting references is obsolete as it is the buyer that creates the invoice.

## Benefits of using the electronic accounting reference

Once a company has started sending and receiving invoices in electronic format, we see that the transmission of accounting references in electronic format is a logical next step on the path towards increased automation of the financial administration processes. There are numerous benefits of using the electronic accounting reference. Next, we will go through the benefits related specifically to the adoption of electronic accounting reference. We have categorized the main benefits from the adoption of the electronic accounting reference into benefits related to (1) process efficiency, (2) improved customer service, and (3) control and speed. Naturally, these benefits are interlinked to each other.

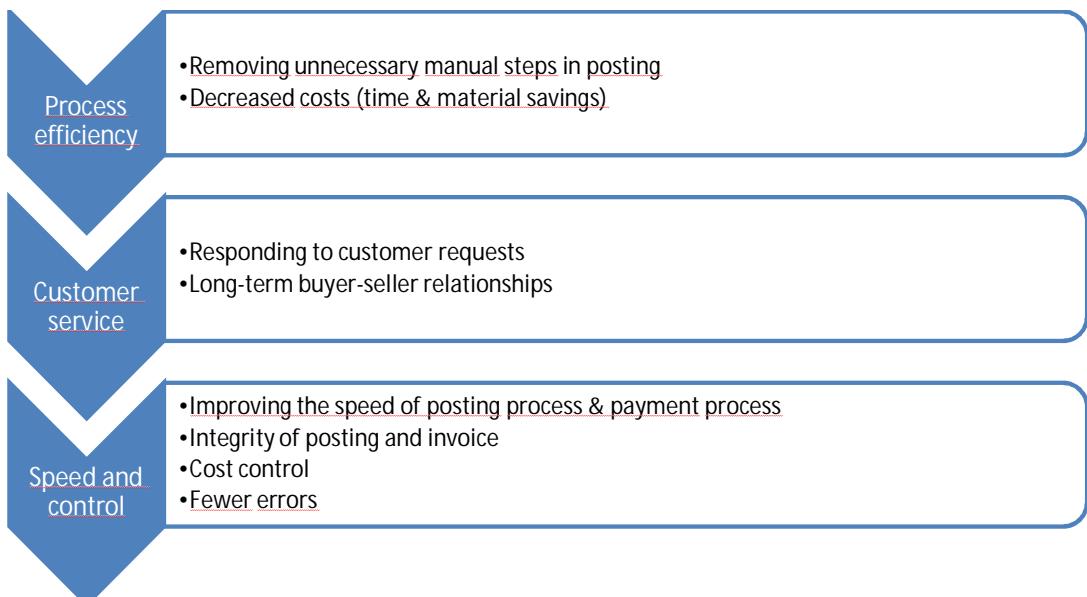


Figure 5. Benefits of using the electronic account reference

### Process efficiency

First and foremost, the use of the electronic accounting reference removes unnecessary manual steps in the posting process of incoming invoices. This removal of manual steps translates directly to time savings in the invoice handling process. These time savings depend heavily on the amount and type of invoices that are handled. According to our case studies, the manual posting process of a single invoice may generate costs up to 20-25 euros. Typically, the receivers of invoices that contain large amounts of data benefit from the electronic accounting reference. The electronic accounting reference allows the posting information to be transferred on a row-level and this benefits especially buyers that receive large amounts of row-specific invoice data.

In addition to time savings, the use of the electronic accounting reference contributes to a decrease in paper consumption as well. The implementation of electronic invoices already removes the need to transmit invoice data in paper format. However, we have noticed that in cases where the accounting information is transmitted electronically on the invoice, even less paperwork is needed. This is due to the fact that the personnel processing these invoices very often print out the electronic invoice when the posting process is conducted manually.

### Customer service

By sending the invoice pre-accounted to the buyer, the seller provides better service to the customer. Companies are aggressively searching for ways to provide value-adding services to their customers. Typically, in moving to these value-adding services, the supplier does more for the customer company than it used to do in the past and seeks to take over some of the customer's tasks. This is the case in the electronic accounting reference as well as the seller is taking over some of the buyer's accounting tasks. Therefore, the companies that have started to provide invoices equipped with accounting information see that adding the electronic accounting reference to the invoice is a way to provide better service to the customer. We will illustrate this with a case example in the next section (ALD Automotive).

In some cases, the customer demands the invoice data to be transmitted with accounting information. In these cases, the supplier is merely responding to customer requests and ensuring the continuation of the business relationship. The use of the electronic accounting reference may result in long-term buyer-seller relationships and increase the "stickiness" between the buyer and the seller.

By transmitting the electronic account reference, the buyer and the seller can get the most benefit out of electronic invoices. Therefore, we see the use of the electronic accounting reference as a means to promote the use of electronic invoices as well.

### Speed and control

The third main benefit from transmitting the electronic accounting reference is related to speed and control. Information is more reliable without human intervention, resulting in fewer mistakes in the processing of incoming invoices. In other words, the integrity of posting and invoice can be improved by implementing electronic accounting references.

The implementation of electronic accounting reference promotes better cost control and makes surveillance much easier. The estimates of pending invoices (open invoices that will have to be paid) are improved as well. The reporting can thus be pushed towards real-time reporting.

The electronic accounting reference speeds up the process of handling incoming invoices. Incoming invoices will get accepted more quickly as the incoming invoice can be directed to the right approver by using the accounting reference as an indicator of a suitable approver for the specific invoice. Naturally, the posting of the incoming invoice can be done more quickly as well and this speeds up the payment process. Fewer payments will run overdue, resulting in lowered payment process costs.

## Creating competitive advantage through electronic accounting references – Case ALD Automotive

ALD Automotive is the leading provider of car leasing services in Finland. It has operations in 40 countries and is part of the Société Générale group. ALD Automotive began operating in Finland in 1979 and its turnover reached 226 million euros in 2009. Its market share in Finland is 40% of new car leasing contracts. The "installed base" of ALD Automotive leasing cars in Finland is around 23000 cars and purchases total around 7600 car per year. Typically, an ALD Automotive leasing car is sold after the three year lease contract comes to its end. ALD Automotive employs 103 people in Finland.

### Background information on electronic invoicing and posting information

In 2001, ALD Automotive began sending invoices electronically to their B2B customers. Very soon the company realized that in order to harness the benefits of the electronic invoicing practices, the company had to find ways to provide accounting information alongside the basic invoice data. This is because one invoice may contain over 10000 lines of separate products and services and these items have to be posted to the accounting systems at the customer site. Providing the customer this accounting information with the invoice data was seen as a great opportunity to add value to the customer and at the same time free resources at the ALD Automotive's side. There was one large customer company who requested accounting information from ALD Automotive so ALD was also responding to customer requests when initiating the project.

ALD Automotive's ERP system is rather old and in the beginning of the project, ALD Automotive had problems in generating the posting information from its ERP system in an easy and efficient way. To overcome this challenge, the company contacted StreamServe which created a system where the customer's accounting information is attached to the ALD Automotive's invoice data. We will discuss this solution in greater detail in the next section.

Another challenge was to get the buyer's accounting information so that ALD Automotive could insert them onto the electronic invoice. To overcome this challenge, therefore, the company decided to map all the possible alternative row level identifiers that appear in ALD Automotive's invoices. As a result of this mapping procedure, a keyword-based accounting chart was created (see Table 2). This chart was sent to the customer company so that they could add their own accounting information to it.

Row level identifier in ALD Automotive	Customer's accounting information	Description of the item
Leasing fee		Car leasing fee
Administration fee		Administration fee
Service charge		Service charge which is not included in the leasing contract
Vehicle inspection		Vehicle inspection service fee
Kilometres		
Courier service		
...	...	...

Table 2. Keyword-based accounting chart at ALD Automotive

Sending accounting information along with the invoice data to customer companies

The following figure (Figure 6) presents the functioning of the ALD Automotive accounting information procedure. The invoice data is sent from the ALD Automotive ERP system to StreamServe in ASCII format. StreamServe then enriches the invoice data by inserting the accounting information to each xml-line on the invoice. This mapping is done based on the customer number in the invoice data.

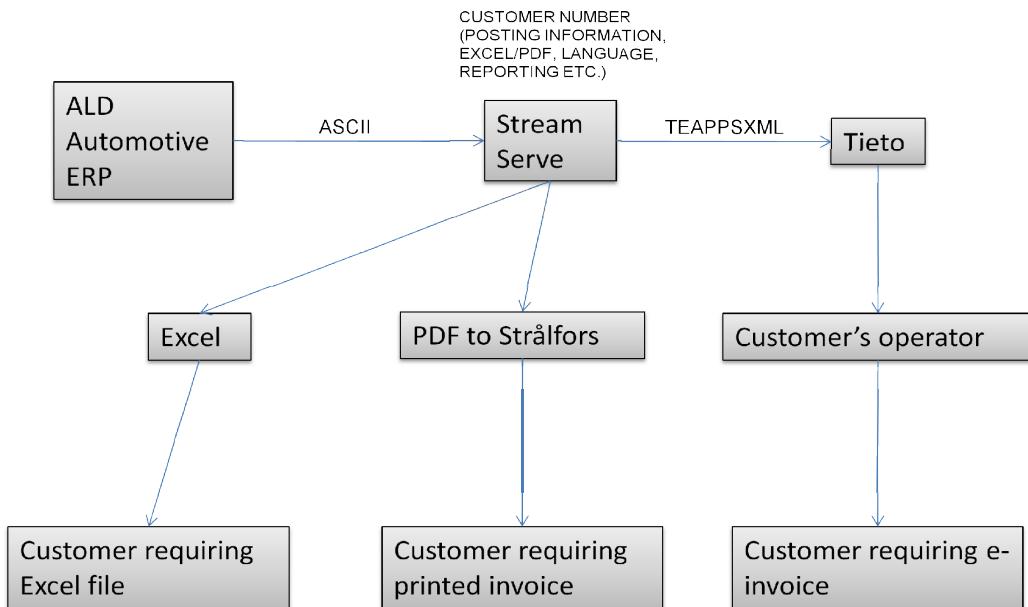


Figure 6. Case ALD Automotive

The ASCII file contains a code which informs the recipient's preferred channel for receiving the invoice. There are three alternative channels that ALD Automotive proposes to its clients: paper, Excel, and electronic. Currently, around 33% (1570/4700) of ALD Automotive's outgoing invoices go to the electronic invoicing channel. It is mainly international clients that require the invoice data (including posting information) in Excel format. The following figure (Figure 7) depicts the progression of electronic invoicing at ALD Automotive from its inception in 2001. The figure also presents the volumes of customer companies that have chosen to receive the accounting information, reaching 118 customer companies in 2009.

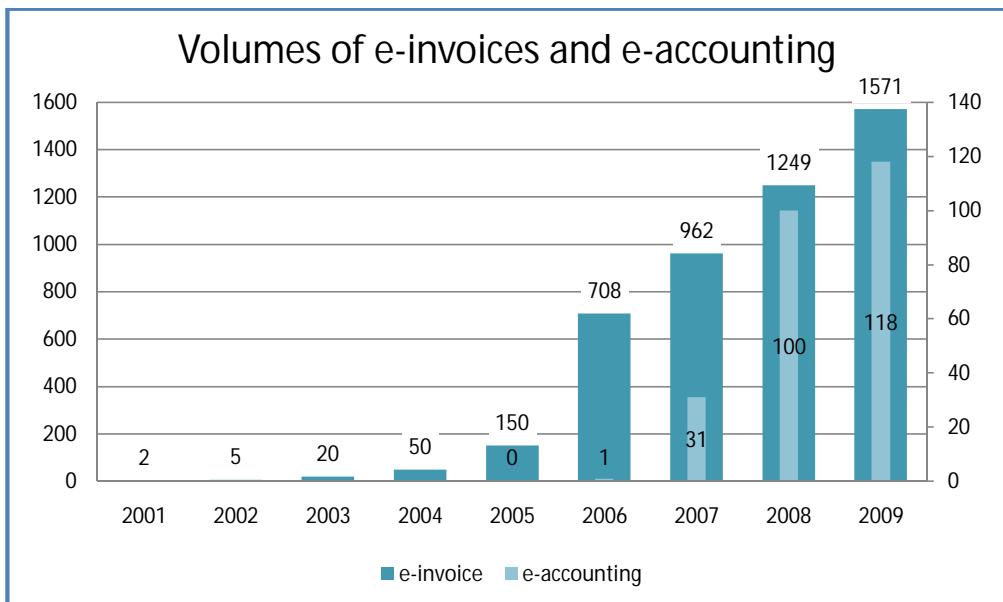


Figure 7. Volumes of electronic invoices and electronic accounting references at ALD Automotive

In addition to the customer number and the code indicating the preferred channel, the ASCII contains a language code. The language code controls the output language of the invoice. StreamServe holds a translation template which can be used to translate every term on the invoice. Adding another language to the system is very easy, the user just needs to provide the corresponding terms in the language being added. This enables the sales people to offer the invoice in the customer's own language.

Once the accounting information is added to the invoice data, the data are then archived in Stream Serve in its entirety. This archive can be used by ALD Automotive in giving customers detailed reporting services. The customer typically informs ALD on its needs for leasing reporting and ALD then provides these reports automatically by e-mail. The customer may choose the accounts to be followed as well as the time window to be used for the reports (monthly, quarterly, yearly).

### Benefits from using the posting information to the customer

There are clear benefits for the customer when receiving the accounting information alongside the invoice data. First, the customer company can post the invoice to the financial system automatically, thus saving considerable manual effort in matching the invoice and resulting in fewer errors in the actual posting procedure. In addition, there is the possibility of attaching a taxcode to the electronic invoicing data. The enhanced reporting services are useful to the customer as well as the customer can run reports on quarterly spending on car leasing 1,5 months before the end of the quarter (e.g., Q2 reports can be run in mid-May). The receivers of the traditional paper invoices get benefits as well. The StreamServe system allows it for the customer to get paper invoices that include the accounting information on each line in the invoice. This enables a more efficient matching process at the customer site.

## Benefits from using the posting information to ALD Automotive

Concerning the benefits to ALD Automotive, the main advantage is the improved customer satisfaction. By providing the posting information and the reporting tools, ALD Automotive has been able to gain competitive advantage. Improved customer service enables the sales pitch to not be focused on pricing issues only. Automating the reporting to the customer has enabled ALD Automotive to transfer personnel from reporting to more productive work. ALD Automotive estimates that implementing the Excel-attachment option has enabled ALD Automotive to save one person's weekly work per month. Payback time of the project has been very short for ALD Automotive.

## Conclusions

In this white paper, we set out to explore the possibilities of transmitting accounting information on the electronic invoice. It turned out that sending accounting information to customer companies is quite common. However, the practices vary greatly in companies and, therefore, the objective in this white paper was to harmonize these practices by proposing the use the electronic accounting reference.

The reference length is limited to 35 digits and does not allow for the use of separation marks. The buyer may choose to include various accounting dimensions in the reference (cost pool, project number etc.), provided that they fit into 35 digits. The fields for transmitting the electronic accounting reference in the most commonly used Finnish message descriptions are Account\_Reference in TEAPPSXML 2.7.1 and AccountDimensionText in Finvoice 1.3.

The benefits of electronic account reference were categorized into (1) increased process efficiency, (2) improved customer service, (3) enhanced control and speed. The challenges of implementing the electronic accounting reference are two-fold. First, the account reference needs to be communicated from the buyer to the seller so that this information can be included in the invoice. We propose several avenues for doing this in this white paper for different kinds of invoices. We also provide a case example of ALD Automotive to illustrate how accounting references can be included in contract-based invoices. Second, there are technical challenges. Financial administration software will need to update their systems so that they support the electronic accounting reference.

We strongly encourage companies to consider using electronic account references. We strongly recommend the financial administration software developers to include the fields for handling electronic accounting references in their software updates.

## Appendix 1: Technical solutions

### Finvoice 1.3 – electronic invoicing message description

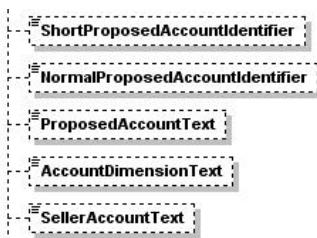
In F invoice 1.3, a posting proposal can be created in accordance with the basic list of accounts, in which case data is forwarded at the invoice level in the ShortProposedAccountIdentifier and NormalProposedAccountIdentifier fields. A posting proposal that is not based on the basic list of accounts is placed in the Dimension or ProposedAccountText element.

A posting proposal can also be created at the invoice row level, in which case the RowShortProposedAccountIdentifier and RowNormalProposedAccountIdentifier fields are used. RowAccountDimensionText and RowProposedAccountText are intended for forwarding mutually agreed posting and cost centre information.

Sellers can add their own posting data to the SellerAccountText element of the invoice. This data is intended for the seller's own accounting. If the seller delivers an invoice copy to the accounting firm, for example, postings related to the invoice can be completed in the seller's system or when an invoice is created.

#### Invoice/heading level in the InvoiceDetails structure

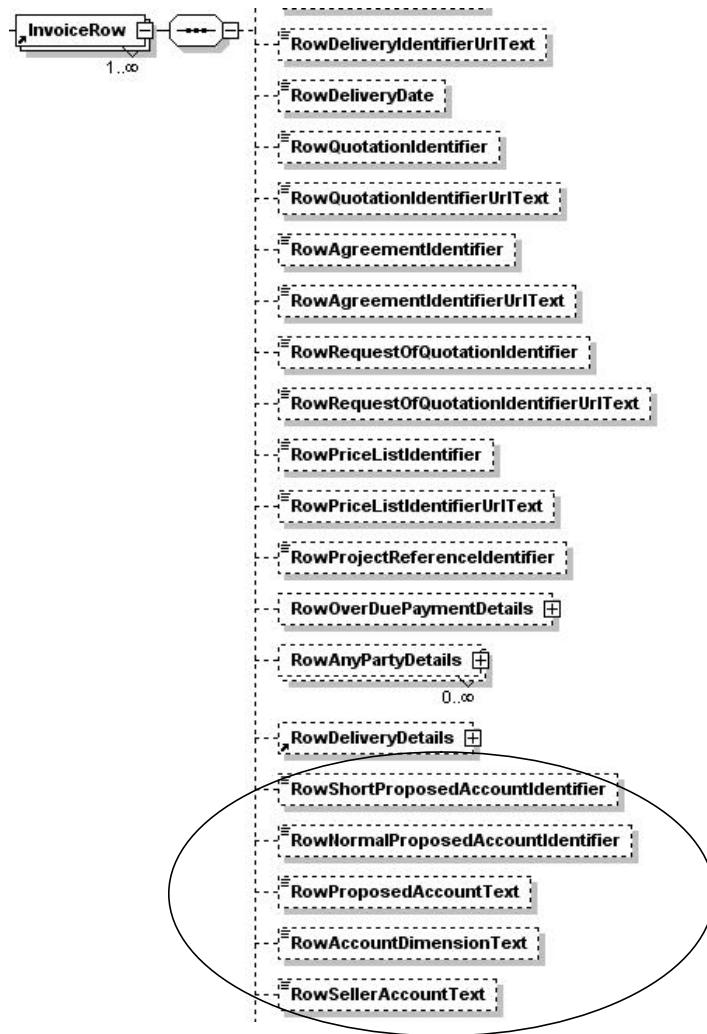
- ShortProposedAccoutIdentifier = short account number
- NormalProposedAccountIdentifier = normal account number
- ProposedAccountText = other posting information than the basic accounting scheme number
- AccountDimensionText = accounting dimensions
  - cost pool, department, project etc. dimensions are divided using a suitable separator, e.g., star (\*) or semi-colon
  - an example: account1;cost pool;department;project
- SellerAccountText = sellers' accounting information, this information is for the seller's own book-keeping



#### Row level - InvoiceRow -structure

- RowShortProposedAccountIdentifier = short account number
- RowNormalProposedAccountIdentifier = normal account number
- RowProposedAccountText = other posting information than the basic accounting scheme number
- RowAccountDimensionText = accounting dimensions
  - cost pool, department, project etc. dimensions are divided using a suitable separator, e.g., star (\*) or semi-colon

- RowSellerAccountText = sellers' accounting information, this information is for the seller's own book-keeping



In addition, the corresponding elements can be found in the Finvoice SubInvoiceRow –structure.

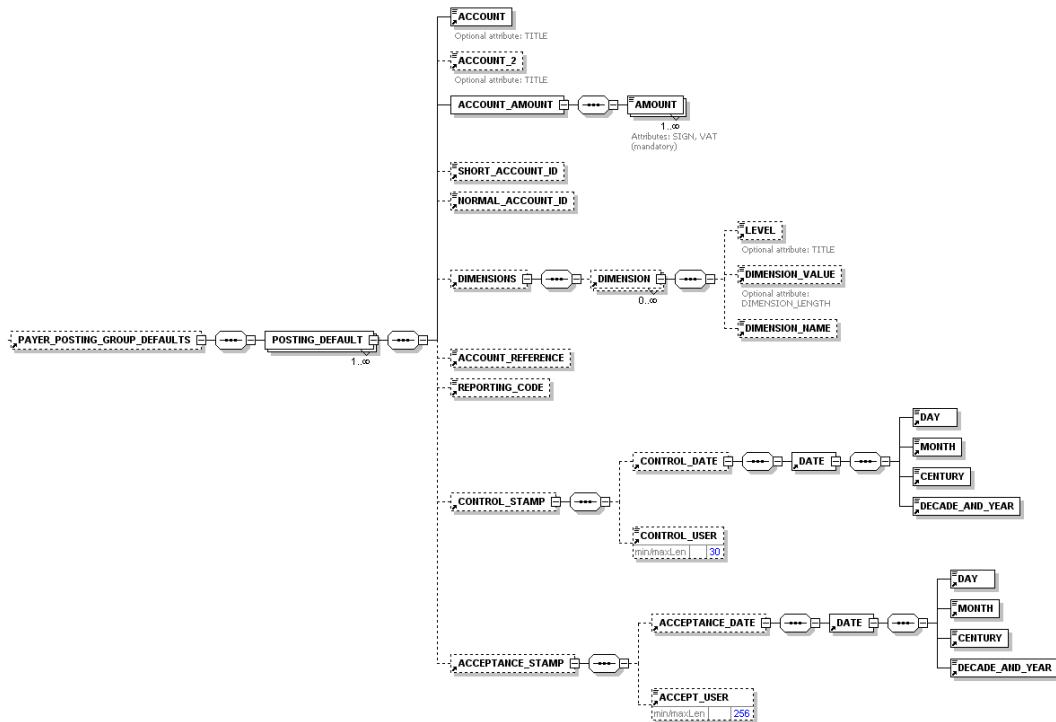




## TEAPPSXML 2.7.1 – electronic invoicing message description

### Invoice level in the INVOICE/HEADER-structure

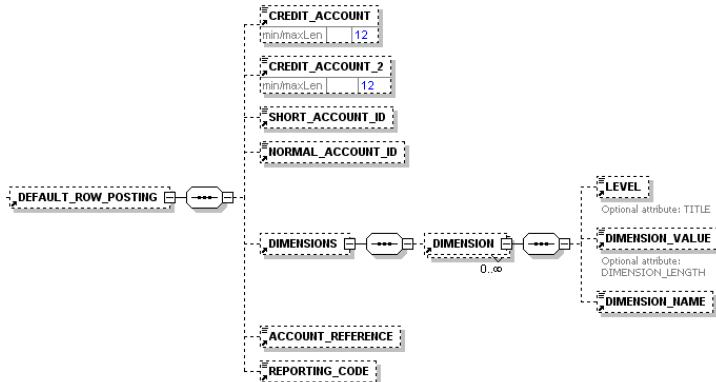
- ACCOUNT = account number
- ACCOUNT2 = internal account number
- ACCOUNT\_AMOUNT/AMOUNT = amount, SIGN and VAT-attributes
- SHORT\_ACCOUNT\_ID = short account number
- NORMAL\_ACCOUNT\_ID = normal account number
- DIMENSIONS/DIMENSION – structure holds dimensions: cost pool, department, project etc. dimensions
  - LEVEL
  - DIMENSION\_VALUE
  - DIMENSION\_NAME
- ACCOUNT\_REFERENCE = account reference
- CONTROL\_STAMP – structure = control stamp, which is used by the recipient
- ACCEPTANCE\_STAMP – structure = acceptance stamp, which is used by the recipient



### On row level in the INVOICE/ROWS/ROW – structure

- CREDIT\_ACCOUNT = account number
- CREDIT\_ACCOUNT2 = internal account number

- SHORT\_ACCOUNT\_ID = short account number
- NORMAL\_ACCOUNT\_ID = normal account number
- DIMENSIONS/DIMENSION –structure holds the following dimensions: cost pool, department, project etc. dimension
  - LEVEL
  - DIMENSION\_VALUE
  - DIMENSION\_NAME
- ACCOUNT\_REFERENCE = account reference
- REPORTING\_CODE=reporting code



## Accounting information in invoice messaging descriptions (other than TEAPPSXML and Finvoice)

### EDI-messaging descriptions used in Finland

In order to examine the possibilities to use the account references in EDI messaging, the following EDI – invoice messaging descriptions were explored: INVOIC 91.1, INVOIC 94 and INVOIC D.93A (FI0066)/INVOIC D.96A (FI0067).

In the INVOIC –messages, traditionally, ordering information is transmitted between the buyer and the seller – namely order number and order date. In addition, INVOIC-messages include a specific structure for cost pool reference. INVOIC description does not have a direct field for an accounting information or basic account scheme number. INVOIC-messages do offer some alternatives (e.g., FTX-segment) for transmitting buyer-supplier specific information. The INVOIC-messages do not, however, provide a general application guidelines for these elements.

In order to explore the possibilities of transmitting the electronic account reference in ordering messages, we examined the EDI-messages that are most used in Finland: ORDERS 91.1,ORDERS D.96A ja ORDERS D.99A. Especially, we explored the ORDERS D.99A. On the invoice level, these ordering messages allow the transmission of, for example, the buyer's order number, seller's order number, contract number, and work number. On the row level, they allow the transmission of, for example, the delivery number, cost account

number, contract number, and work number. All these data can be a part of the electronic account reference, however, a specific field reserved for the reference cannot be found in the ORDERS messages. The ORDERS messages do have and FTX – segment allowing the two parties to transmit mutually agreed upon information. This field is not a standard field but a field reserved for the business relationships specific information.

#### POSTI-XML

The Laskunet-service provided by Itella uses the POSTI-XML description which has similar accounting structures to the TEAPPSXML-description. The description includes fields for general ledger account and balance account, accounting dimensions and amounts. In addition, the POSTI-XML includes elements – such as voucher class, voucher number, accounting period, VAT information of entries, and approver – which can be used internally in the handling of incoming invoices.

#### CII – Cross Industry Invoice

The schema for the Cross Industry Invoice (CII) has very recently been published and we are currently going through the schema concerning the transmission of electronic account references.

#### UBL orders

The Finnish electronic invoice operators have prepared an application directive concerning the use of UBL in the transmission of orders, order confirmations, and delivery notifications in the operator network. The message description includes fields for purchase order numbers and client references. In addition, the message description has a field for references that can be freely added to the message. This field may contain, for example, a work number or project number. To conclude, there are no specific fields reserved for the transmission of the electronic account reference. The two parties must agree upon a field to be used for this purpose.

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