Requirements and Challenges for the Migration from EDIFACT-Invoices to XML-Based Invoices

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1 Introduction

The automated creation and provision of electronic invoices (e-invoices) increase the efficiency of the business process and is seen as a key factor for an economic growth for large enterprises as well as for the small and medium sized enterprises (SMEs) (Cuylen et al. (2012)). The e-invoice can be received, transmitted and edited digitally and without media discontinuity which optimizes the e-invoicing process. Legal requirements and the lack of knowledge how to deal with an e-invoice were only some challenges to initiate the e-invoicing process. The law of Simplifying Tax in 2011 with the objective of equal treatment of paper and electronic invoices and a lot of effort and enlightenment of the government, EU as well as organizations are reasons for the discussion about e-invoices and their acceptance. Many transmission protocol, structure data formats and standards are used for the data exchange. This involves many challenges for the adoption and acceptance since the effort is high to unify the invoice business process.

E-invoices do not only save time and money but also protect the environment by having less paper. The enterprises rethink their behavior on the environment and owning therefore a positive aspect at the side of the employees (Sage (2012)). The key advantages can be realized when the e-invoice is not only an e-mail and PDF-file but also structured data sets for example EDIFACT or XML. The e-invoicing process is established in many large enterprises. It is a business process with much room for improvement since there is still no uniform standard to transmit structured data. Especially SMEs are not integrated in the electronic data interchange in the business-to-business (B2B) sector (CEN Members (2012); Expert Group EU Kommission (2009)). For much larger enterprises a data exchange called Electronic Data Interchange (EDI) is established. The messages, not only invoices, are in the structured data format EDIFACT, which is in Europe a dominant standard (Georg (1993)).

The vision of the Federal Ministry for Economic Affairs and Energy is it that the market provides software and information systems to support e-invoicing

like the already established electronic banking. As a prerequisite a uniform standard is needed (Haug (2014)). A standard, developed in Germany, of the organization FeRD (Forum fuer elektronische Rechnung Deutschland "Forum for electronic invoicing Germany") is the ZUGFeRD (Zentraler User Guide des Forums elektronische Rechnung Deutschland) standard. The forum has the task and target to support the acceptance and adoption of e-invoices. For that reason they have elaborated one standard which can be used easily by any enterprise. It should enable to exchange e-invoices without making a mapping or any other additional arrangements between the business partners (FeRD (2013)).

In particular, SMEs have not yet or not fully implemented an e-invoicing process and the implementation is associated with many requirements and challenges. These will be elaborated and discussed within this thesis. The XML-based invoice may fill the gap between the EDIFACT and the PDF or paper invoices without any structured data. Since EDI is mainly suitable for larger enterprises which exchange business documents along the entire supply chain it is not used everywhere and with every customer or supplier. An ongoing business relationship is needed to implement a business sense process. Hence an easy standard without many arrangement and high investments could be established in large as well as small and medium sized enterprises to send and receive structured data and realize therefore the entire benefits of e-invoicing. This can fully migrate the previous process of the enterprises or it can be only a further option.

From this background, the following central research question of this thesis is derived:

RQ 1: What are the requirements and challenges for a migration from EDIFACT invoices in XML-based invoices?

The further research questions are:

RQ 2: What are the factors of influence to encourage the adoption of a XML-based standard for the invoice dispatch? and
RQ 3: Which measures can enterprises take to motivate their business partners to receive XML-based invoices?

The main objective is the answer of the research questions and the discussion as well as the analysis of the influence factors. Recommendations for the

implementation of XML-based invoices will be given and may support the acceptance and adoption of e-invoicing.

The remainder of this master thesis is structured as follows: After this introduction, the research background is addressed, including electronic invoicing definition and the legal basis, definition of the business process and explanations of structured data sets. An extensive literature review on the subject e-invoice and current standards is performed. It turns out that EDIFACT and XML should be considered closer since they represent currently prevailing standards. Hence especially a comparison of EDIFACT and XML formats is shown. The third chapter, the qualitative exploration and expert interview, provides details about the problem definition for sending and receiving invoices in XML format, hypotheses are derived and used for the design of an interview guide. The interview guide and the questions are described and the procedure is presented. The data presentation takes place in section four by explaining the qualitative content analysis and the current and target state of the enterprises concerning the e-invoice process. The results are shown in chapter five. Hypotheses examination, recommendations and the discussion of the results are shown within this chapter. As with any research, limitations arise, which are presented in chapter six. The thesis ends with a short conclusion and outlook.

7 Conclusion and Outlook

The aim of this thesis is to identify requirements and challenges for the migration from EDIFACT to XML-based invoices. As known from the results, the XML-based invoices can initially fill the gap between the invoices of a fully automated process within the EDI procedure and the remaining paper or PDF invoices. A large market share of a XML-based standard must be achieved. Therefore the first challenge is to implement the standard within non-users of EDI. A greater competition, increasing digitization of business processes and environmental awareness cause to rethink electronic invoicing in enterprises and therefore are drivers for the implementation. For younger generations IT is part of their every days life. Therefore they do not feel any strangeness to electronic data like many older people do. Due to this they will regard the e-invoice as natural, therefore there will be no obstacles for its adoption.

Before the law of Simplifying Tax in 2011 e-invoicing was only possible within EDI connections or by files with an electronic signature which is associated with much effort. Hence new standards in XML had not yet much time to be implemented, but by now they achieve more adoption. The decision to introduce the EDI connection was also influenced by the legal situation, and this is a reason why so many users of EDIFACT-invoices exist.

The established EDI connections have completely automated business processes with EDIFACT-invoices, and only little space for optimization is available. As soon as a XML-based standard such as ZUGFeRD in Germany, has a large number of users and is established in the remaining business relationships, further challenges may arise. Thereafter the advantages of EDIFACT need to be compensated by the further development of XML and its transmission. The current disadvantages of XML-based messages like the size of the files and the high transmission rate due to the usage of Internet will become irrelevant by the further development of IT and high-speed Internet. It is e.g. possible to create zip.-files and reduce thereby the size, and due to increasing computational power the transmission rate will become higher. It means that

the transmission time will not much differ to the current EDI transmission so that this advantage of EDIFACT is in future no longer relevant.

By a longer establishment of XML-based standards and a high adoption, the error-proneness will also be very low due to testing and continuous developments. The internationalization is possible and the standard must be accepted at least throughout Europe. The largest disadvantage of EDIFACT messages is, that arrangements are required and that the implementation is associated with high effort and investments. The ZUGFeRD standard has less room for interpretation and is developed for the implementation without any additional arrangements. Hence these disadvantages will not arise. The invoice standard can be used as a basis for further business documents and represents a chance for a higher standardization as EDIFACT has today. By all these factors, XML-based standards have much potential to gain a large market share and may in not foreseeable future completely replace the EDIFACT messages such as invoices. The migration will start with an increasing market share of XML-based invoices.