International Journal of Industrial Engineering and Management (IJIEM), Vol. 5, No. 1, 2014, pp. 13-21
Available online at http://www.iim.ftn.uns.ac.rs/ijiem_journal.php
ISSN 2217-2661

UDK 004.738.5:658.7]:624(436)

The Role of E-Procurement in the Austrian Construction Industry: Adoption Rate, Benefits and Barriers

Bernd Markus Zunk
Assistant Professor, Graz University of Technology, Institute of Business Economics and Industrial Sociology, Kopernikusgasse 24/II, 8010 Graz, Austria, bernd.zunk@tugraz.at

Martin Johannes Marchner
Research and Teaching Assistant, Graz University of Technology, Institute of Business Economics and Industrial Sociology, Kopernikusgasse 24/II, 8010 Graz, Austria, martin.marchner@tugraz.at

Iris Uitz
Research and Teaching Assistant, Graz University of Technology, Institute of Business Economics and Industrial Sociology, Kopernikusgasse 24/II, 8010 Graz, Austria, iris.uitz@tugraz.at

Carina Lerch
Master Student, Graz University of Technology, Institute of Business Economics and Industrial Sociology, Kopernikusgasse 24/II, 8010 Graz, Austria, carina.lerch@tugraz.at

Holger Schiele
Professor, University of Twente, School of Management and Governance, Department of Operations, Organization and Human Resources, Hallenweg 10, 7522 Enschede, The Netherlands, h.schiele@utwente.nl

Received (10.12.2013.); Revised (23.02.2014.); Accepted (10.03.2014.)

Abstract

The progressive developments force suppliers on efficiency-driven construction markets to reorganize their internal organization. Especially the complex and not standardized procurement process holds high cost reduction potential. To exploit this potential, suppliers need to understand the purchasing routines of their buyers. Hence, a rising number of supplying firms consider e-procurement solutions to foster and to optimize the direct link to their buyers. The central question of this contribution concerns the role of e-procurement in procurement processes of industrial buyers and reports the results of a respective survey study among 100 construction firms in Austria. The survey study focuses on the adoption rate of e-procurement solutions as well as the used functions and software solutions. Furthermore, benefits and barriers of buyers in the construction industry for using e-procurement systems are highlighted. The findings show that e-procurement is not frequently adopted in the construction industry and that the potential for cost reduction is not exploited to the full.

Key words: *Industrial Markets, Construction Industry, Buyer-Supplier Relationships, Procurement Process, E-Procurement*

1. INTRODUCTION

Firms have to improve their internal processes in order to enhance their overall performance. One important and cost intensive operational sequence is the purchasing process which causes non-negligible administrative expenses on the interface between buyer and supplier. A strategy to reduce these costs is to minimize the complexity of the procurement process. Therefore, in practice a lot of firms have introduced electronic procurement (e-procurement) systems in the past. The literature [1] reports that e-procurement helps firms to procure products and services at the lowest total costs. Besides saving costs for the supplying firm, higher switching costs for buying firms emerge through customer integration. This leads to a higher customer retention rate and makes it more difficult for competitors to get access to the supplying firm's customers. Customer integration can be implemented by connecting the buyer's business information system with a B2B (business-to-business) interface of the supplying firm. "B2B integration" enables customers to place their orders via their own business information system, which is directly transmitted to the supplier. To provide this service it is necessary for the supplying firm to know which interfaces their customers support.

Many studies have been conducted about e-procurement and the use of interfaces between buyer and supplier in different industries [2, 3]. However, the construction industry is relatively under-represented in these studies. Especially for technology-based firms on industrial markets, respectively, on B2B markets there is a major potential to increase the efficiency of their purchasing and operations processes. Only the study conducted by the market research firm Forit [4] presents the adoption of e-procurement systems in various industries including the construction industry in Germany; in this study the construction industry showed the lowest adoption rate. No empirical evidence has been found concerning the adoption of e-procurement by the broad mass of buying firms in the construction industry. Therefore, this paper aims at answering the following guiding research question:

Which roles do e-procurement systems in the Austrian construction industry play to enhance the efficiency of the procurement process?

To answer this question, first we are interested in the status quo of the adoption rate of e-procurement in the construction industry. Second, we analyse the key functions of e-procurement systems industrial buyers are willing to use as well as the already used e-procurement software solutions. Third, we focus on the reasons to use or not to use ordering software to identify benefits and barriers for an implementation.

This paper is structured as follows. The theoretical background in Section 2 addresses the efficiency of buyer-seller relationships on industrial markets and the procurement process with a special emphasis on e-procurement. Section 3 outlines the methodology to answer the research question. Section 4 presents the results of this study based on the empirical findings from a survey study. Therein, we first focus on the adoption rate of e-procurement in the Austrian construction industry. Second, the functions of the ordering software used by suppliers are examined. Third, the reasons for using or not using e-procurement, respectively, ordering software are analysed. The last section, Section 5, concludes this paper with a summary.

2. THEORETICAL BACKGROUND

2.1 Efficiency in buyer-seller relationships on industrial markets

Recently, the ways firms relate with their suppliers on industrial markets have changed considerably. According to the literature, strategically managed relationships with key suppliers have a positive impact on a firm's supplier performance [5, 6, 7]. Moreover, through a long-term relationship, the supplier will become part of a well-managed chain and will have a lasting effect on the competitiveness of the entire supply chain [8].

Since manufacturing companies such as construction firms, are increasingly focusing on their core competences for strategic purposes, an increasing reliance on long-term perspective can be determined [9]. Their aim is to establish "new" buyer-supplier relationships. Prajogo and Olhager [10] found three key characteristics of this kind of "new" buyer-supplier relationships: (1) customers are interested in building long-term relationships, (2) suppliers become an integral part of the buying firm's operations and (3) customers want fewer but highly efficient suppliers.

From an operative management practitioner's point of view two out of these three mentioned characteristics are relevant: to integrate suppliers in the purchasing process of the customer and to enhance the efficiency of the interface between buyers and suppliers. Therefore, in industry big global technology-based corporations such as Intel or Bosch have created so-called "preferred supplier" programs in order to simplify the purchasing process that aims at efficient collaboration with a pre-defined supplier base [11]. This change in the buyer-supplier relationship has led to various avenues of collaboration, including profit and risk sharing as well as early supplier integration.

De Toni and Nassimbeni [12] report further implications of long-term buyer-seller relationships. For example, firms may be willing to invest significantly in building the relationship, including information technology (IT) and information sharing. Furthermore, it was found that the greater the mutual trust, the greater the IT customization, and the greater the strategic information flows [13]. It was also observed that long-term orientation affects supply chain architecture, which includes IT capabilities and information sharing [14] as well as a significant relation between long-term relationships with suppliers and information sharing [15]. An option to build such an IT and information sharing system that also reduces costs and complexity, is the introduction of e-procurement which is especially used in industrial markets.

2.2 The procurement process

Kim and Shunk [16] found that some authors describe the procurement process as a four-phase model, which originated from a three-phase model by Schmid [17], whereas others subdivide it into even more phases. The four-phase model subdivides itself in the primal phases of information, negotiation and settlement and is extended by the after-sales phase.

Information			Negotiation	Settlement					After-Sales
Information			Negotiation	Settlement					
Identify Need	Find Sources		Arrange Terms	Purchase					Use, Maintain, Dispose
Search, Select Supplier		Develop Input Spec.	Negotiate Terms	Order Input			Monitor Quality		Fix Problems after the Order
Knowledge, Information		Intention Target Def.	Negotiation, Contracting	Settlement, Execution, Handling					
Recog. Need	Transmit Need	Select Supplier		Issue P.O.	Follow Up	Recieve	Audit Invoice	Close Order	
Pre-Contract			Contract	Ordering Logistics			Settlement		Post-Processing
Pre-Trade				Trade					Post-Trade

Figure 1. Procurement process models [16]

In the information-phase, the buyer has to identify and anticipate material or service needs, search the market for potential suppliers and request information, proposals, quotes and bids. Afterwards, price as well as availability, quality, payment conditions and customization possibilities are arranged in the negotiation-phase. Once a delivery schedule has been agreed on and the contract has been completed, the settlement-phase is reached. Shipment, delivery and payment are determined based on the contract terms appointed before. Last but not least, the after-sales phase includes the measurement of the supplier performance as well as the consumption, maintenance and disposal of the perceived services or goods [18].

2.3 E-procurement

Due to globalization and the emergence of the Internet, the accessible market has grown, thus leading to unprecedented opportunities for sellers and buyers alike. Managing the purchasing process by traditional means can be very inefficient and interminable due to the excessive complexity. The use of electronic media in procurement activities can be conducive and thus lead to a significant cost and time reduction. In most common definitions, e-procurement is the streamlining of the procurement process by eliminating paper–based documents and rather conducting parts or all of the purchasing process via web-based communication systems [19].

Nevertheless, the exact definition of e-procurement is still being discussed. For some authors, e-mail ordering is also part of e-procurement, others draw the line at ordering via online shops and some only talk about e-procurement if ordering software either in combination with e-mail or electronic data interchange (EDI) is used for the procurement process. Tatsis et al. [20], for example, define e-procurement as “the integration, management, automation, optimization and enablement of an organization’s procurement process, using electronic tools and technologies, and web-based applications.”

De Boer et al. [21] note that e-procurement facilitates, simplifies and enhances the corporate buying process on several levels and encompasses multiple functionalities, such as web based ERP (Enterprise Resource Planning), e-sourcing, e-tendering and/or integrated automatic procurement systems [19, 20]. In addition to electronic ordering, the given definition of e-procurement also entails bidding and rendering via intra- and extranets, marketplaces and/or EDI.

Is e-procurement able to gain competitive advantages for companies [22]? Eliminating traditional paper-based documents and using e-procurement systems can lead to benefits in seven categories [18], which are briefly described below:

- Improved general condition: E-procurement systems provide consolidated information about the suppliers, their product details and price. As a consequence, there is no need for further negotiation in subsequent purchase orders. Surveys have shown that in companies involved in e-procurement, purchasing staff spend less time on operative tasks and more time on strategic issues [23].
- Shorter purchasing process: Due to the automated and monitored e-procurement process organizations can reduce the cycle time of purchases [20, 24].
- Higher price transparency: On the one hand, the increased price transparency and the possibility to simply compare equivalent products that come along with it, reduce the ex-ante purchasing enormously. On the other hand, existing relationships with suppliers might lead to discounted prices [25].
- Lower administrative costs: In their analysis of several studies, Schoenherr and Tummala [26] found several aspects that lead to a drastic reduction in transaction as well as manual costs and increased efficiency: process automation with e-procurement, incorporating stages from the initial need identification by users through search, sourcing, negotiation, ordering, receipt and post-purchase review [24, 27]. Some studies even revealed that companies were able to achieve process cost reductions of 60% to 80% through the application of e-procurement, [28].
- Improved collaboration with suppliers: The implementation of e-procurement enables enterprises to build and manage long-term relationships with suppliers. Better contract compliance and a lower error rate can be further consequences of this improved collaboration [29].
- System improvement: Using e-procurement can help to improve the information flow and thus lead to better internal and external communications. Employers can gain direct access to the supplier’s system.
- Acquisition of data in the system: One big advantage of using electronic ordering software is the recording of all steps conducted within the procurement process in a centralized system. Actual spending with each supplier and in each product category, for example, can be analyzed immediately.

3. METHODOLOGY

The conducted study addresses firms in the Austrian construction supply industry with focus on the building services engineering sector and the steel and metals sector which are part of it. To answer the research question, a customer survey was carried out in order to develop an understanding of the adoption rate and the customer’s readiness for e-procurement adoption and to see in how far customers are prepared for B2B integration on a technical level.

The conducted study also gives insight into customer’s benefits and barriers of e-procurement usage.

This survey was carried out in cooperation with a large well-known firm which supplies machines, tools, different consumable material as well as special mounting systems for different industries, yet focusing mainly on the construction industry. The company is a stock corporation acting worldwide, which has its headquarters in Europe. The conducted study focuses on the Austrian settlement of the firm. All different types of construction companies are supplied by it, from the one-man-business to major corporations. Since different distributing channels are offered by this supplier, customers can fulfil orders in different ways. In the last years new distribution channels have been established because some customers insisted on the simplification of the ordering process, which was achieved by the use of e-procurement. Therefore, an online shop was implemented for customers. It provides the customer with the possibility to order via e-mail, with electronic product catalogues and with the possibility to install a customized EDI interface to simplify and speed up the ordering process.

Concerning the buyer survey, 100 firms were chosen from the population, which is considered as all customers from the supplier. 50 of these firms are from the building services engineering sector and the other 50 are from the steel and metals sector. Thus it was also possible to get an insight in different industry sectors. For the selection of the firms to be interviewed, all medium to large-sized customers of the retailer were divided into classes according to their number of employees, number of orders per year and sales per year. In order to obtain a sample with the same distribution as the population, 100 firms were randomly selected according to the frequency distribution in the several classes.

The survey was carried out using a questionnaire consisting of 17 questions in total that was created by researchers of Graz University of Technology. To enhance validity of the questionnaire it was tested with expert pre-interviews. Key account managers and representatives from the supplier's e-business department provided information and reviewed the questionnaire.

The reviewed questionnaire was used to interview the customer's representatives for procurement for about ten minutes over the phone in order to detect the reasons for and against the use of e-procurement. Another question concerned the EDI interfaces they support and whether the interviewees are fundamentally interested in integration with their suppliers or not.

The data was collected within a three-week period. Since the researchers conducted all interviews personally, which allowed them to evaluate the capacity of each interviewee to answer the questions truthfully, the data quality of this study is considered as high.

4. RESULTS

4.1 Customer's readiness for e-procurement usage

The first part of the conducted survey deals with e-procurement usage. For this reason the survey contained different questions about the ordering behaviour of customers.

Since we know from literature that there is no exact definition of e-procurement, participants of this study were asked if they use e-procurement systems or not, and if they do so which kind of e-procurement do they use.

Figure 2 shows the results of this question. 36 of the 100 respondents stated that they do not use e-procurement systems at all, 64 declared that they use some kind of e-procurement system. Most of them (37 respondents) use special ordering software for procuring, 21 use supplier's online shops and only 6 of the 100 respondents stated that they use special ordering software in combination with an EDI interface.

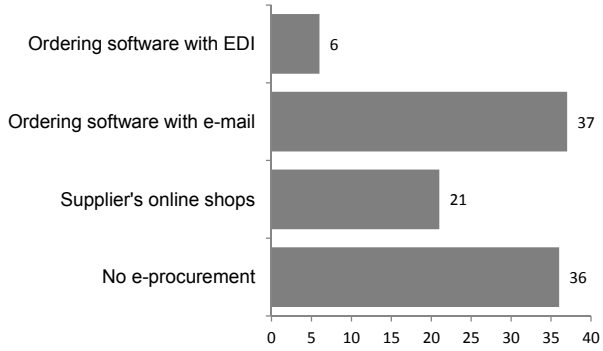

Figure 2. E-procurement adoption rate in the Austrian construction industry

The interesting thing about this question is that the respondents can be split in two different groups: One group had a very good understanding about what e-procurement is, and apparently were well-informed about the advantages of this procurement method. The other group, showed poor knowledge about e-procurement.

They were not able to distinguish between online shops and special ordering software, and were only able to give an answer after a brief explanation. Because of the reason that there is no exact definition of e-procurement we draw the line if an e-procurement system is used at "ordering software with e-mail". That means that for us using supplier's online shops is not an appropriate e-procurement system for this purpose.

Figure 3 shows the usage behaviour split in the two considered sectors, i.e. "building services engineering" and "steel and metals". In the building services engineering sector, 23 firms use ordering software, 10 of those 23 have an EDI interface, but only 6 of them make use of it.

In the steel and metals sector 20 firms use ordering software with e-mail, only 3 of them have an EDI interface but it is not used by any one.

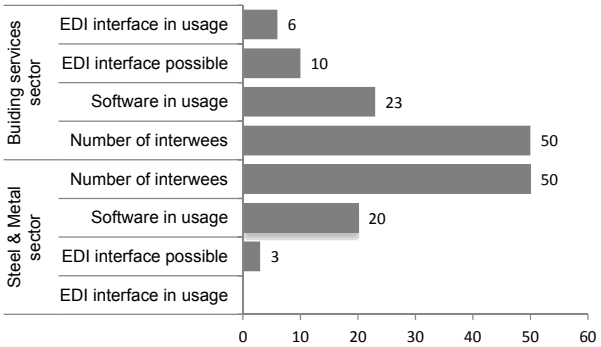

Figure 3. E-procurement adoption rate in the steel and metal and the building services sector

4.2 Used e-procurement solutions and functions

The next question dealt with the different used functions and software solutions. Figure 4 shows the different kinds of software that customers use for procuring.

Interestingly, 10 of 43 respondents declared that they use software for procuring that they have developed on their own. It is obvious that there is no leading standard solution which is used. Most participants use different software solutions and 8 of the respondents do not even know which solution they use.

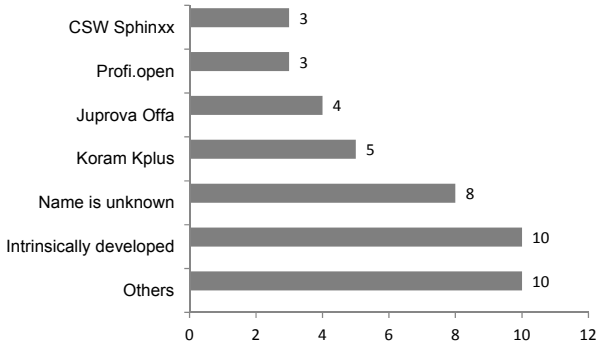

Figure 4. Used e-procurement software solution

In addition to the procurement function, the majority of the used software solutions support other functions too. Depending on the software manufacturer, these products also support functions such as requesting quotes, comparing prices of different suppliers, processing delivery notes and invoices, or even features for the inspection of incoming goods. In order to get an insight into this topic, those 43 study respondents that stated that they use “ordering software with e-mail” or “ordering software with EDI” were asked what for and how often they use their software.

Figure 5 shows different functions of ordering software used by the respondents. Most of them use it for purchasing orders (31) followed by comparing prices (25). Almost 15 stated that they use the software for processing quote requests, delivery notes and invoices electronically. Hardly any company uses the software for processing collective invoices or for inspecting incoming goods.

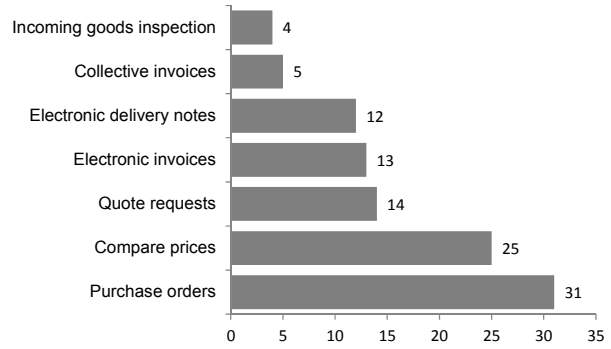

Figure 5. Used functions of e-procurement software solutions

What is also interesting is the frequency of usage. Figure 6 shows how often companies use the different functions of their ordering software.

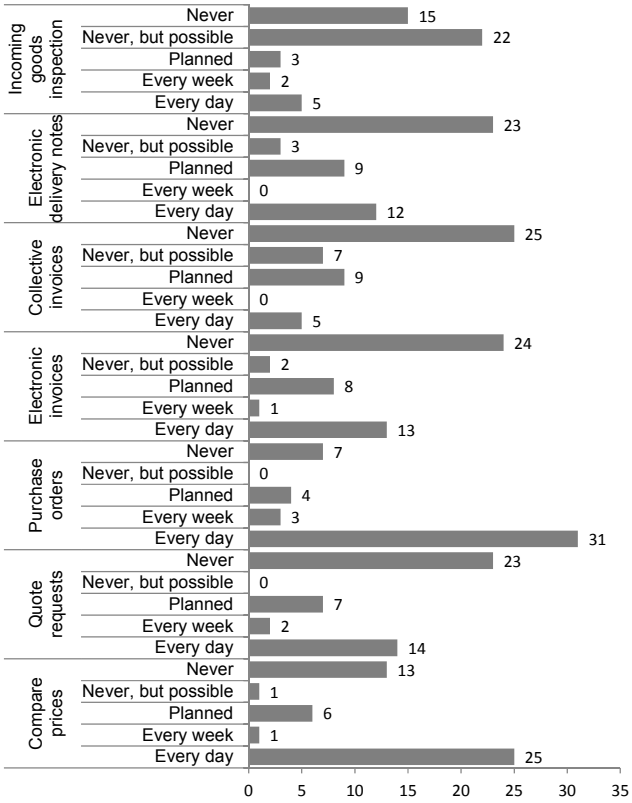

Figure 6. Ordering software: Frequency of function usage

The functions that are used quite frequently are comparing prices and purchasing orders. 25 of the 43 respondents declared that they use their ordering software every day to compare prices, 31 use it daily for purchasing orders. Functions such as processing collective invoices or electronic delivery notes are not used frequently. Only 5 respondents use the function processing collective invoices daily but 25 stated that they do not use it at all.

Figure 7 shows the evaluation of the daily software usage depending on business sectors. As it was pointed out in Figure 3 the building services sector is more e-procurement enthusiastic than the steel and metals sector. It can be seen that every function is used more in the building services sector in everyday business than in the steel and metals sector.

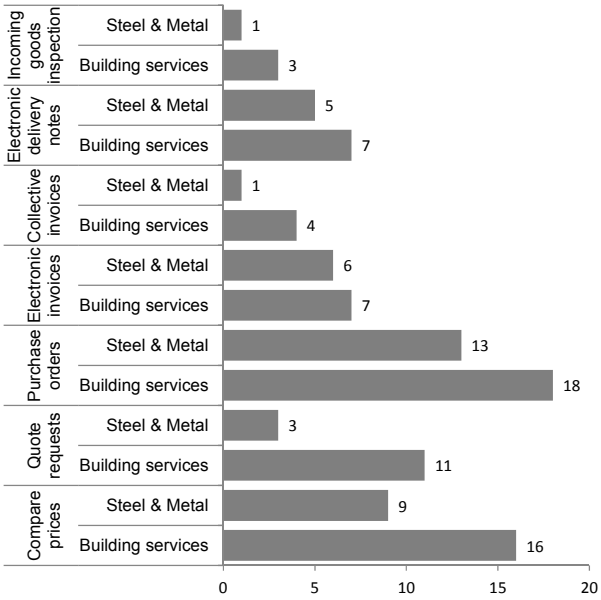

Figure 7. Used functions split in two sectors

4.3 Benefits and barriers of e-procurement usage

To find out the benefits of using e-procurement, all firms that are using ordering software to order via e-mail or EDI were asked to indicate their motivation. In the following section, "ordering software" is used as a synonym for ordering software which sends orders via e-mail and ordering software which sends orders via EDI. Depending on whether customers use ordering software or not, they were asked for the reasons for their decision. It was found that in almost all companies the CEO is the decision maker as far as the introduction of an e-procurement system is concerned.

Based on the literature review and expert interviews, seven benefits have been identified as main reasons for the use of e-procurement. The respondents who use ordering software (43) were asked to indicate to what extent these benefits apply or do not apply to them. Figure 8 shows the respondents' reasons for using ordering software.

Price transparency, which means the possibility to compare prices of different suppliers easily, is a benefit for 22 of the respondents to use ordering software. Time saving, which means a shorter purchasing process, can be achieved by ordering software, which 37 of respondents specified as a benefit for the use of it. Although time savings and cost savings to reach lower administrative costs belong together, only 28 of the respondents who are using ordering software indicated this as a benefit. The opportunity to improve the collaboration with suppliers is considered appropriate by 14 of the respondents. Almost 40% of the respondents use ordering software because of system improvement, which means improvement of the information flow, or because the general conditions which were arranged with the suppliers can be monitored more easily.

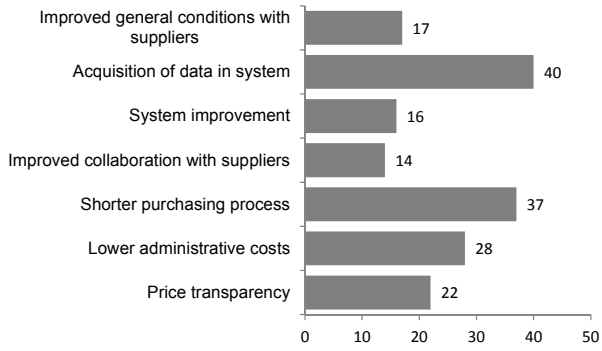

Figure 8. Reasons for using ordering software

The main benefit of the use of ordering software is the automatic acquisition of the orders in the system. This is a great advantage for 40 of the customers because the ordering data do not have to be entered manually into the ERP system afterwards, but is gathered immediately.

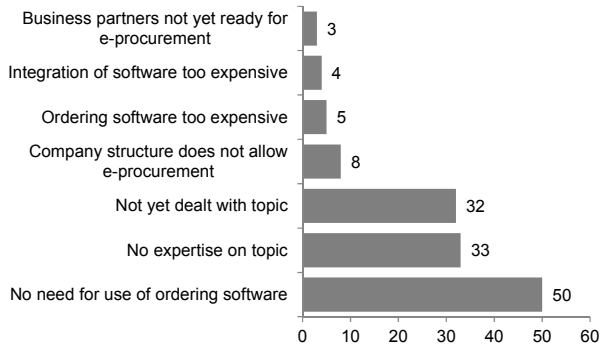

Figure 9. Reasons for not using ordering software

Respondents who stated that they do not use ordering software were asked about the barriers of e-procurement adoption and why they order via traditional ways.

50 of the respondents stated that the main barrier for them is that the company does not need to use ordering software because they have standardized processes within their company including the procurement process. These processes have been developed over years and are working well for the firm, so there is no need to change. 33 of the respondents reported that they know about ordering software but do not have any respective expertise. 32 of the respondents have not yet dealt with e-procurement at all; some of them do not even know that it is possible to support the purchasing process with software. It is likely that these three factors are related and customers do not see any need for e-procurement, or do not even know about it, and so it is

not necessary for them to deal with this topic. Thus it can be seen that the barriers rather concern the lack of information about e-procurement and the nonexistent demand for such a system than the costs for it. The questions if ordering software or the integration is too expensive for the firms, or if business partners are not ready for integration yet, were answered by very few respondents. Due to the fact that the respondents have not yet dealt with the topic and therefore have no information about costs of software and integration, it was not possible for them to answer these questions. 8 of the respondents argued that the company structure does not allow to order in a centralized way when using ordering software. This means that every foreman is responsible for ordering all materials for their construction site by themselves and therefore it is not possible to centralize the purchasing process with the support of e-procurement.

5. DISCUSSION AND CONCLUSION

E-procurement is infrequently adopted in the Austrian construction industry. Only 6 of the interviewed firms use e-procurement, i.e. ordering via an integrated EDI system. 37 of the buyers in the construction industry use e-mail services to order and 21 use suppliers' online shops. A massive difference in the adoption rate of e-procurement turns out when comparing these results of the survey study in the construction industry to other industries like the automotive industry.

In the automotive industry almost every company uses e-procurement systems. Reasons for the difference of the adoption rate of e-procurement between these two industries may be that the automotive industry concentrates on mass production and distribution of nearly similar products while construction firms are predominated by a project-related business. Most projects are customized and therefore they differ from each other and the material and services needed have to be ordered and calculated separately for every project. This makes it harder to standardize the procurement processes which are a precondition for the implementation of ordering software. It is evident that e-procurement provides not as much cost reduction potential to the procurement department in the construction industry as in industries that always use the same parts.

Furthermore, the Austrian construction industry is organized in numerous small and medium sized firms (SMEs) and only few big players. This might also be a reason for the low adoption rate. Those SMEs lack experts for process design, purchasing etc., and so they fail to consider e-procurement while running their daily business. It is therefore not astonishing that most of them do not even know about the existence of e-procurement systems and the opportunities provided to enhance their efficiency within their internal process.

Our analysis shows that the majority of the respondents who belong to the construction industry use e-procurement to place orders or to compare prices. This indicates that construction companies do not really know the functioning and efficiency that highly-developed e-procurement systems provide. In addition, this result shows that construction firms do not see the advantages e-procurement systems are providing.

Even more, they do not recognize the operative and strategic advantages that an integration of suppliers in their internal processes provides.

The analysis of the reasons for using ordering software paints the following picture: Construction firms that use e-procurement systems do this to achieve data for the purchasing system, to have shorter purchasing processes, to lower administrative costs and to gain transparency in prices the suppliers are offering. The main reasons for not using ordering software are that buying firms in the construction industry do not recognize the need for using ordering software, have no expertise in this field or do not even know the advantages of e-procurement tools as they have not dealt with this topic before. Another reason might be that e-procurement is not relevant for most buying companies in the Austrian construction industry as they are operated by the government or large corporations that have strict process guidelines or legal requirements.

The presented study demonstrates that there is not as much cost reduction potential for the procurement management in the construction industry as in an industry that always uses the same parts and therefore has no standardized procurement process. It can be summarized that Austrian construction companies that use e-procurement systems in order to enhance their efficiency do so because they regard e-procurement a good possibility to reduce complexity in the procurement process, want to improve collaboration with their suppliers and consider e-procurement as a possibility to reduce process costs. To sum up, e-procurement is not a current issue and plays a very limited role in the Austrian construction industry yet.

Based on our findings the following measures can be suggested for the management board. (1) Purchasing departments have to gain knowledge in the area of e-procurement as a lack of knowledge is the main barrier for the implementation of such a system. (2) E-procurement is a good way to reduce complexity in the purchasing process and helps to reduce costs caused by the purchasing department and thus has to be seen as an operational measure which needs a strategic decision.

Finally, some limitations to our study have to be acknowledged. Since all respondents came from one cultural area, cross-cultural differences cannot be considered. However, purchasing issues could be culture-sensitive. In addition to that we did not ask for the company's turnover and number of employees; hence, it is impossible to provide additional analyses of the adoption rate based on the size of the company. Nevertheless, it can be assumed that there may be a difference in the adoption rate of e-procurement in small, medium and large sized companies.

6. ACKNOWLEDGEMENT

This paper is a revised version of contributions presented at the 22nd International Society for Professional Innovation Management Conference (ISPIM) from June 12th to June 15th 2011 in Hamburg, Germany, and the 4th International Scientific Management of Technology – Step to Sustainable Production Conference (MOTSP) from 14th to 16th of June 2012 in Zadar, Croatia.

We would like to acknowledge all the helpful and valuable comments of the reviewers on earlier drafts.

7. REFERENCES

[1] Kasaj, K. (2001), *„Oracle – E-Procurement Präsentation“*, Nekolar, A. (Ed.), E-Procurement – Euphorie und Realität, Springer Verlag, Berlin.

[2] Bogaschewsky, R. (2012), *„Elektronische Beschaffung 2012: Stand der Nutzung und Trends“, Universität Würzburg, available at: http://www.cfsm.de/studien/elektronische-beschaffung* [17.12.213].

[3] Sommnitz, L. (2012), „eProcurement: Einsatz von Beschaffungssoftware in deutschsprachigen Unternahmen, available at: http://www.beschaffung-aktuell.de/home/-/article/33568332/37546535/Beschaffungssoftware-Kloepfel/art_co_INSTANCE_0000/maximized/ [17.12.2013].

[4] Forit (2001), *„B2B-Umsätze der Zukünftig wichtigsten eCommerce-Branchen in Deutschland“*, Net-Business.

[5] Carr, A.S., Pearson, J.N. (1999), *“Strategically managed buyer-seller relationships and performance outcomes”,* Journal of Operations Management, Vol. 17, No. 5, pp. 497–519.

[6] Zunk, B.M., Schiele, H. (2011), *„Preisstabilität durch „Preferred Customer Status“: Einflussfaktoren auf Innovationsleistung und Preisgestaltung von Lieferanten*“, Zeitschrift für wirtschaftlichen Fabrikbetrieb, Vol. 11, No. 12, pp. 974–978.

[7] Schiele, H. (2012), *“Accessing supplier innovation by being their preferred customer”,* Research-technology Management, Vol. 55, No. 1, pp. 44-50.

[8] Choi, T.Y., Hartley, J.L. (1996), *“An exploration of supplier selection practices across the supply chain”*, Journal of Operations Management, Vol. 14, No. 4, pp. 333–343.

[9] Prahalad, C.K., Hamel, G. (1990), *“The core competence of the corporation”*, Harvard Business Review, Vol. 68, No. 3, pp. 79–91.

[10] Projago, D., Olhager, J. (2012), *“Supply chain integration and performance: The effect of long-term relationships, information technology and sharing, and logistics integration”*, International Journal of Production Economics, Vol. 135, No. 1, pp. 514-522.

[11] Zunk, B.M., Marchner, M.J., Schiele, H. (2012), *“Does e-procurement help to become a preferred supplier and establish long-term buyer-supplier relationships?”*, Management of Technology Step to Sustainable Production 2012 proceedings of the international conference in Zadar, Croatia, pp. 82-91.

[12] De Toni, A., Nassimbeni, G. (1999), *“Buyer-supplier operational practices, sourcing policies and plant performances: results of an empirical research”*, International Journal of Production Research, Vol. 37, No. 3, pp. 597–619.

[13] Klein, R., Rai, A., Straub, D.W. (2007), *“Competitive and cooperative positioning in supply chain logistics relationships”*, Decision Sciences, Vol. 38, No. 4, pp. 611–646.

[14] Sheu, C., Yen, H.R., Chae, B. (2006), *“Determinants of supplier–retailer collaboration: evidence from an international study”*, International Journal of Operations and Production Management, Vol. 26, No. 1, pp. 24–49.

[15] Paulraj, A., Lado, A.A., Chen, I.J. (2008), *“Inter-organizational communication as a relational competency: antecedents and performance outcomes in collaborative buyer–supplier relationships”*, Journal of Operations Management, Vol. 26, No. 1, pp. 45–64.

[16] Kim, J. I., Shunk, D. L. (2004), *“Matching Indirect Procurement Process with Different B2B E-procurement Systems”,* Computers in Industry, Vol. 53, No. 2, pp. 153–164.

[17] Schmid, B.F. (1993), „Electronic Markets“, Wirtschaftsinformatik, Vol. 35, No. 5, pp. 465–480.

[18] Lerch, C., Uitz, I., Marchner, M., Zunk, B.M., Ringhofer, M. (2011), *“Does Lead Customer Innovation Influence the Procurement Process? An Empirical Analysis Investigating the Adoption Rate of E-Procurement Systems in Austrian Construction Firms“,* International Society for Professional Innovation Management 2011 proceedings of the international conference in Hamburg, Germany.

[19] Presutti, W.D. (2003), *“Supply Management and E-procurement: Creating Value Added in the Supply Chain“*, Industrial Marketing Management, Vol. 32, No. 3, pp. 219-226.

[20] Tatsis, V., Mena, C., Van Wassenhove, L.N., Whicker, L. (2006), *“E-Procurement in the Greek Food and Drink Industry”*, Journal of Purchasing & Supply Management, Vol. 12 No. 2, pp. 63-74.

[21] De Boer, L., Harink, J. and Heijboer, G. (2002), “*A conceptual Model for Assessing the Impact of Electronic Procurement*”, European Journal of Purchasing and Supply Management, Vol. 8, No. 1, pp. 25-33.

[22] Schiele, H. (2004), „*Wettbewerbsvorteile durch IT-Beschaffung: Das Technologieübernahmeparadoxon in der IT*“, HMD Praxis der Wirtschaftsinformatik , Vol. 41, No. 239, pp. 28-37.

[23] Flicker, A., Holler, J. (2000), *„E-Commerce Based on Internet Technologies in Procurement“*, Donau-Universität Krems.

[24] Morris, A., Stahl, A., Herbert, R. (2000), *“E-Procurement: Streamlining Processes to Maximize Effectiveness”*, Luminant Worldwide Corporation.

[25] Venkatesan, R. (1992), *“Strategic Sourcing: to Make or Not to Make”*, Harvard Business Review, Vol. 70, No. 6, pp. 98-102.

[26] Schoenherr, T., Tummala,V.M.R. (2007), *“Electronic Procurement: A Structured Literature Review and Directions for Future Research”*, International Journal of Procurement Management, Vol. 1, No. 1-2, pp. 8–37.

[27] Smart, A., Harrison, A. (2003), *“Online Reverse Auctions and their Role in Buyer–Supplier Relationships”,* Journal of Purchasing & Supply Management, Vol. 9, No. 5-6, pp. 257–268.

[28] Ringhofer, M., Gangl, B., Höllbacher, S. (2008), „*Mehr Effizienz mit E-Procurement*“, Das Österreichische Gesundheitswesen, Österreichische Krankenhaus Zeitung, Vol. 49, No. 12, pp. 40 - 42.

[29] Hoque, F. (2000). “E-Enterprise”, Cambridge University Press.

Uloga e-nabavke u austrijskoj građevinskoj industriji: stopa usvajanja - prednosti i barijere

Bernd Markus Zunk, **Martin Johannes Marchner**, **Iris Uitz, Carina Lerch and Holger Schiele**

Primljen (10.12.2013.); Recenziran (23.02.2014.); Prihvaćen (10.03.2014.)

Rezime

Progresivni razvoji primoravaju dobavljače na građevinskom tržištuzasnovanom na efikasnosti da reorganizuju svoje interne organizacije. Uposebnom smislu, kompleksni i nestandardizovani postupci

nabavke imajupotencijal smanjenja velikih troškova. Kako bi se iskoristio ovajpotencijal, dobavljači treba da razumeju kupovne rutine svojih kupaca.Stoga, sve veći broj firmi dobavljača razmatra e-nabavku kao rešenje zapodsticaj i za optimizaciju direktne veze sa kupcima. Centralno pitanjeovog doprinosa odnosi se na ulogu e-nabavke u procesima nabavke kodindustrijskih kupaca i navodi rezultate studije izvršene sa 100građevinskih kompanija u Austriji. Studija se fokusira na stopu usvajanjarešenja e-nabavke, kao i na korišćene funkcije i kompjuterske programe.Dalje, istaknute su prednosti i barijere za kupce u građevinskojindustriji koji koriste sisteme e-nabavke. Ovi rezultati pokazuju dae-nabavka nije često usvojena u građevinskoj industriji i da potencijaliza smanjenje troškova nisu u potpunosti iskorišćeni.

Ključne reči: Industrijska tržišta, građevinska industrija, odnos kupac-dobavljač, proces nabavke, E-nabavka