

Organizational and economic consequences of business e-procurement intensity

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Abstract

The implementation of e-procurement by companies implies a diverse degree of Internet use during different purchasing processes. The purpose of this research is to analyze how the intensity of Internet use in the procurement process impacts firms from a different point of view: organizational and economical. The organizational consequences refer to the structure of the buying center in terms of size, participation, number of hierarchical levels and functional areas. Economical consequences materialize in concrete purchase results in terms of efficacy and efficiency. In this research, the intensity of Internet use in the procurement process is determined by two factors: the stage of purchasing process and the number of Internet tools involved in each stage. The survey was performed by splitting the sample of 103 industrial Spanish companies into two groups: those showing a low intensity of Internet use in the procurement process and a second group with a high intensity. Results show that intensity of e-procurement causes an increase in buying center size and in the number of functional areas involved in the purchase. We also notice that efficacy and efficiency increase, either by reducing costs in the search for information or by allowing the purchase of higher quality products at lower prices.

To sum up, our research provides empirical evidence for Internet added-value in terms of its ability to transform the information stream within firms, and the consequences derived from this fact on industrial purchasing processes. All these factors allow better purchasing decisions to be made. It can be a powerful instrument to reach competitive advantage and can establish itself as a key factor for business success.

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Keywords: Industrial purchasing; E-commerce; Electronic procurement; Buying center

1. Introduction

Industrial purchases represent almost 90% of the transactions carried out on the Internet (Lee et al., 2003; Dussault, 2001; Huggins, 2001). In the Spanish context, according to the DMR Consulting — AETIC report, 26.3% of firms with at least one wage earner claim to have made purchase(s) on the Internet, whereas 6.1% state that they use this medium for sales activities.

There is plenty of research underlining the potential benefits related to e-procurement (e.g., Boyle and Alwitt, 1999; Min and Galle, 1999; Avlonitis and Karayanni, 2000; Tang et al., 2001; Boyd and Spekman, 2001; Porter, 2001; Aberdeen Group, 2001; Arthur Andersen Business Con-

sulting, 2001; Essig and Arnold, 2001; Boer De et al., 2002; Puschmann and Alt, 2005). Most of them emphasize the following issues: (1) Internet added-value lies in its ability to contribute to cost reduction associated to communication and transaction. Internet allows access to a large amount of information with lower costs in time and money than those derived from the use of other tools, both inside and outside the organization; (2) the use of e-procurement helps to decentralize the more administrative purchase processes and also to centralize the most strategic ones (e.g., supplier selection); (3) the use of this technology promotes a greater coordination inside the company and an improvement in efficiency; (4) the use of Internet in the purchase process allows to obtain swiftly a high quantity of quality information and, therefore, it reduces the risk and uncertainty related to the purchase. In this way, it is possible to reduce transaction costs resulting from a lack of information, both *ex-ante* and *ex-post*;

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(5) e-procurement is an element that creates value for the company and (6) this technology contributes to encouraging confidence between companies. Greater transparency favors communication and collaboration between buying and selling organizations.

Even assuming that a company has adopted e-procurement, it is necessary to take into account that in the multiple purchasing processes taking place in firms, the intensity of Internet use can vary. What effect does this have on the company? Can we presume the same consequences—organizational and economic—for the intensity of Internet use in the purchase process as for those already studied for the adoption of e-procurement? This paper attempts to provide an answer to these questions. Specifically, the aim of this research is to analyze the organizational and economic consequences of intensity of Internet use in the industrial purchasing process.

In this study, the intensity of Internet use is determined by two factors: the stage of the purchase process in question and the number of Internet tools involved in each stage. For the empirical research, we divided the sample of 103 industrial Spanish companies into two groups: those showing a low intensity of Internet use in the procurement process and a second group showing high intensity.

Taking as reference the theoretical model proposed by Osmonbekov et al. (2002), the organizational consequences of the intensity of use of Internet in the purchasing process considered in this paper concern the structure of the buying center. The buying center comprises all those involved in some way in the purchasing process (Webster and Wind, 1972). The structural aspects of the buying center analyzed here include size, functional areas, hierarchical levels and participation. Besides, following the theoretical model proposed by Osmonbekov et al. (2002), several procurement outcomes are also analyzed. The economical consequences of e-procurement refer to efficiency and effectiveness of the purchasing process, according to the classification of economic consequences of e-procurement proposed by Kalakota and Robinson (1999).

We anticipate that taking as a reference the traditional literature on the process of industrial purchasing and other more recent studies related to the characteristics of Internet as communication medium, our hypotheses relating to the consequences of the intensity of Internet use on the structure of the buying center contradict the approaches on the pioneering research by Osmonbekov et al. (2002). Our proposals are based on the fact that in comparison to face-to-face communication, the use of the different e-procurement tools has been shown in literature to increase the overall communications within the organization (Hiltz et al., 1986). This reflects what is perhaps the most fundamental benefit resulting from the use of IT in organizations: the ability to connect and enable employees both within and between functions and divisions, corporate offices and countries—whether through database, teleconferencing, or electronic mail (Afuah and Tucci, 2000; Dewett and Jones, 2001). Therefore, the use of the Internet

impacts the way value-adding units within a firm coordinate their activities in ways that previous IT have not permitted (Afuah and Tucci, 2000). The ability of the Internet to coordinate activities within and outside of one organization can be extrapolated to buying center structures. Under to our approach, and taking into account that the buying center belongs to the organizational informal structure, the intensity of Internet use in a purchasing process is positively related to the size of the buying center, i.e., the number of people taking part in the process. As a consequence, a greater number of functional areas and hierarchical levels will be involved in the purchasing process; therefore, the individual participation in this process will decrease.

The empirical research performed in this paper is based on a capital equipment purchase. In this high-risk situation, organizational buyers typically undertake extensive, deliberate choice processes—rather than making a casual selection—to reduce decision risk (Hunter et al., 2004). Our analysis shows a positive relationship between the intensity of Internet use in the purchase process and the size of the buying center, the number of functional areas involved in the purchasing process and the efficacy and efficiency of the process.

The main contribution of this paper is, on one hand, to provide the first empirical research on the topic of e-procurement intensity and its consequences. Until now, no paper has analyzed the intensity of Internet use in the purchase process. On the other hand, researches studying the consequences of e-procurement, both economic and organizational, are focused on the adoption of Internet tools. This paper therefore constitutes a step forward in the study of e-procurement. It is also one of the first pieces of empirical research about the economical and organizational consequences of Internet use.

This paper is divided into the following sections: firstly, we study the concept of e-procurement. We then indicate the hypotheses of the model of industrial purchase through Internet. Finally, we deal with methodology, results and conclusions. The implications of the research are also outlined.

2. The intensity of business e-procurement

E-procurement can be defined as “using Internet technology in the purchasing process; it involves using network communications technology to engage in a wide range of activities up and down the value-added chain both within and outside the organization” (Applegate et al., 1996, p. 32).

Using the above definition, several forms of electronic procurement can be distinguished. Boer De et al. (2002) propose six different forms: e-MRO (maintenance, repair and operating), web-based ERP enterprise resource planning, e-sourcing, e-tendering, e-reverse auctioning and e-informing. All of these refer to activities related to the purchasing and performed using Internet tools.

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