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Impact on Information Economics Analysis of Electronic Markets– An Overview of E-Procurement in Supply Chain Management

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ABSTRACT

Electronic procurement is currently one of the most discussed topics in supply management. Without doubt, it will dramatically change the way purchasing is done in the near future. This article analyses the possibilities of electronic marketplaces for buyers, primarily from theoretical perspective and is also based on information economics theory, which may be the most important theory to analyze market problems in general. An e-procurement matrix is developed that could help to systematize different e-procurement instruments. Various data types available from electronic marketplaces are analyzed with a business model for electronic market places. These business models show the real value added by e-procurement. According to Neef (2001), "E-procurement means a giant leap forward in the long sought-after development of the extended enterprise where the supply chain becomes a continuous, uninterrupted process extending from buyer through selling partners."

Keywords: E-procurement, information, economics, purchasing, macro, micro, transactions, and customers.

1. INTRODUCTION

Electronic procurement is currently one of the most discussed topics in supply management. Without doubt, it will dramatically change the way purchasing is done in the near future. This article analyzes the possibilities of electronic marketplaces for buyers, primarily from theoretical perspective and is also based on information economics theory, which may be the most important theory to analyze market problems in general. According to Neef (2001), "E-procurement means a giant leap forward in the long sought-after development of the extended enterprise where the supply chain becomes a continuous, un-interrupted process extending from buyer through selling partners.

2. IMPROVE COORDINATION EFFICIENCY IN THE ECONOMY: THE INFORMATION TECHNOLOGY REVOLUTION (STEP 1)

The data on the development of electronic commerce on a macro level show a bright future for e-procurement studies forecast a growth in e-commerce volume (B2B) in Europe from US$73 billion in 2000 to US$727 billion in 2003 and in the United States from US$251 billion to US$1331 billion in 2003, e-commerce will not be more than about 15 percent of the total transactions volume. This ration varies between 4 percent in agriculture and 28 percent in the automotive industry. These data lead to the conclusion that not all procurement problems can be solved by Internet technology. Specifically, the extended flow of information through the internet has to be analyzed carefully to generate useful recommendations on how to implement e-procurement successfully.

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The major changes in information and communications technology are considered to be the second economic revolution. The first one was the "mass production" revolution concentrating on technological advantages in the manufacturing process. Mass production allowed the realization of economies of scale and lower cost per piece yielded lower product prices. As a result, organizations became more and more specialized units, responsible only for one part of the value chain. Today, this trend still drives firms to concentrate on core competencies and core products. As a result, coordination problems arise within modern economic systems. In highly industrialized societies, coordination costs (e.g. Transaction costs) are expected to be more than 60 percent of the gross national product. The information technology revolution focuses especially on the problems of economic coordination. Modern information technology systems have an enormous capacity to handle, process, analyze and systematize information. The intercompany linkage of unstructured information on highly standardized protocol (e.g. the Internet) allows a quantum leap in quantity and quality of economic coordination. AS a consequence, the quality and quantity of information play a key role in modern business. Purchasing as a market-oriented function is a catalyst and sensor for information from and into the organization. By using tools and techniques with higher information processing capacity, purchasing can become more efficient. But this process is not automatic. Therefore it is necessary to take a closer look at the information issues in procurement.

3. PROBLEMS OF UNCERTAINTY IN SUPPLY MARKETS: THE TRANSACTION FRAME (STEP 2)

A fundamental characteristic of sourcing decisions is their uncertainty. A buyer never has complete information about all aspects of supplier performance and their future development. According to Williamson, dealing with the problem of restricted information means "contracts are unavoidable incomplete". Contracts can never cover all possibilities of future developments. As result purchasing tries to reduce uncertainty by information seeking. E-procurement can be a useful instrument to gain this additional information. In general three main types of uncertainty can be identified. Risk uncertainty in a closer sense, and bounded rationality. Within risk and uncertain situations, the buyer knows all possible actions of the supplier in the future. Uncertainty in a closer sense means that the buyer does not have an estimate of this probability. Under bounded rationality, all of the possible future actions of the supplier are not known by the buyer. This is the most realistic situation. For example, most buyers in fact do not know if a supplier will encounter financial problems, otherwise they would not consider it as a business partner. Only in a perfect market is there no information problem. In real market situations, there are two information deficits: ex-ante and ex-post. The ex-ante deficit could be partly filled by information-seeking activities, but information seeking is costly. Transaction costs increase because information is not a free good in imperfect markets. E-procurement helps to lower these transaction costs by making a wide range of information available to buyers. The question of how e-procurement can help in reducing ex-post uncertainty is discussed later in the article.

The Information problem in procurement: An Information Economics and Transaction-Based Analysis (An information Economics Triangle) (Step 3)

Nelson (1970) and Darby along with Karni (1973) developed three information-based exchange situations called them as "qualities":

- Search qualities that are known before purchase
- Experience qualities that are known costless only after purchase

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- Credence qualities that are expensive to judge purchase

Complex industrial procurement situations are often a combination of these three qualities. Parts of software functionality can be judged after the customer-specific installation, but even after purchase the buying organization cannot be sure about the full adaptability of the system for all future releases.

ELECTRONIC INFORMATION IN THE PURCHASING PHASES: A TRANSACTION-BASED ANALYSIS (STEP4)

As described, the main advantage of e-procurement is the high quantity and quality of information processing. The mixture of search, experience and credence qualities requires different kinds of information, information that may not be available through either e-procurement or classical procurement. The transaction can be divided in a pre-decision phase, the decision itself, and a post-decision phase. Through their nature, search qualities can be inspected prior to the purchasing decision. E-procurement enables purchasers to extend the speed, quantity and quality of information processing. Reverse auctions allow purchasers to make real-time bidding comparisons. Pre-requisitions, this is the kind of information that can be exchanged in e-market places.

COMBINING INFORMATION QUALITIES AND TRANSACTION ANALYSIS: THE E-PROCUREMENT MATRIX (STEP 5)

The Foreign Economist Boer, Harink and Heijboer (2001) define five main forms of e-procurement: Web-based enterprise resource planning (ERP), E-sourcing, E-tendering, E-reverse auctioning, E-informing. ERP is based on Web-integrated enterprise resource planning system that is used internally as a material planning and controlling system. E-sourcing is the process of identifying new suppliers using the internet. E- Sourcing is the process of identifying new suppliers using the internet. E-tendering uses the internet to send requests for quotation (RFOs) to suppliers and for suppliers to return them. E-reverse auctioning supports buyers in running a reverse auction. E-informing represents all activities of gaining additional information through the internet not directly connected with a contract. The e-procurement matrix is simplified way to show the possibilities of e-procurement tools. In fact, e-business related activities will concentrate on the usage of electronic market places. The implications for purchasing management are mainly influenced by the usage of e-markets.

CONSEQUENCES FOR ELECTRONIC MARKET PLACES IN E-PROCUREMENT: THE 4C (STEP 6)

The e-market place itself brings together supply and demand as an Internet based service. Four major businesses can be distinguished. The “connection” business model concentrates on the physical infrastructure. The “context” model deals with classifying and systematizing information. The “clearinghouse” model helps suppliers get connected with all relevant e-market places for their business and finally the “commerce” model dealing with physical handling of goods and services. Purchasers never know completely how the market place provider will act concerning the market place data. Nonetheless, it is absolutely necessary for buyers to be able to judge these market places and their future role.

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4. CONCLUSION

Electronic marketplaces are approaching may be for the first time ever the old economic data of a "perfect market world". Economics has declared a renaissance of neoclassical economic theory without transaction costs because of high reaction speed for all market partners and almost full market transparency. Within the last few years, economics has taken a closer look at the value information. It started with marketing research, for which cost-benefit analyses were required to spend some additional dollars on market research activities. There are still problems with this kind of information analysis. Strategic e-procurement does not only lower transaction cost, it also expands the possibilities that purchasing will create value for the firm.

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