NegotiAuction: An Investigation of Its Possible Adoption

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ABSTRACT

NegotiAuction, a computer system which combines aspects of auctions and negotiations, is expected to overcome limitations in online reverse auctions and multi-attribute online reverse auctions. However, no studies have been conducted to investigate its possible adoption. This study has drawn on an extensive review of literature on theories about innovation adoption, and has proposed a conceptual model for NegotiAuction adoption. Based on the structural equation modeling technique, both linear and non-linear effects on intention to use NegotiAuction were tested. The results show that perceived image was statistically significant in influencing perceived benefit and in turn perceived benefit was statistically significant in influencing intention to use. Practical implications and future studies are also discussed.

KEYWORDS

Auction, Innovation Adoption, Negotiation, NegotiAuction

1. INTRODUCTION

In terms of business-to-business e-commerce, online reverse auctions have been being used by a number of Fortune 1000 companies as a tool to drive down the price of purchased products and services (Emiliani and Stec, 2004). Although there are a variety of definitions on online reverse auctions, they share a common theme that dynamic pricing is likely to be brought about by such auctions. Dynamic pricing means that the price of the auctioned item continuously changes due to the online format. Since the bidders (sellers) compete in real time, the price of the item will keep going down until a true market price is achieved.

Companies from various industries have been utilizing online reverse auctions as a means for procurement (e.g., General Electric, Motorola, Boeing, and Dell to name a few). Some of them save millions of dollars through online reverse auctions as compared with traditional procurement approaches (Brunelli, 2000). Online reverse auctions can bring about benefits for not only buyers but also suppliers. Suppliers can gain market information, create new markets for better excess capacity management, and attract new customers from their competitors.

Besides the above-mentioned benefits of online reverse auctions, some concerns have also been identified. One of the major concerns is that online reverse auctions concentrate primarily on the interests of the buyers, thus long-term relationships between buyer and supplier might be damaged if final price is the only priority of the buyer and if winner determination procedures through the auctions are biased towards the buyer (Jap, 2007).

In order to overcome this concern, new auction mechanisms that take into account non-price attributes such as quality, delivery and payment terms have been designed by software providers...
These are known as multi-attribute online reverse auctions – MAORAs. With MAORAs, buyers must clearly specify their preferences for the attributes to the suppliers. Therefore, each supplier has an index score on the basis of a buyer’s preference. The winner determination procedure is based on both price and suppliers’ score for the non-price attributes. Theoretically, MAORAs are expected to bring about competitive bidding and allocation efficiency (Asker and Cantillon, 2006; Carr, 2003; Milgrom, 2004; Snir and Hitt, 2003).

Although MAORAs with the technique of the scoring function (value function) are expected to be superior to the price only online reverse auctions, there are questions that need to be answered. First, taking scoring functions as given has been criticized by some researchers (e.g., Korhonen and Wallenius, 1996; Larichev, 1984; Simon, 1995) because it is difficult to convert preferences into an accurate value function. Second, there is often an assumption in most studies on MAORAs that marginal costs incurred by suppliers for each attribute level bundle are kept unchanged and independent from quantity (e.g., Beil and Wein, 2003; Bichler, 2000; Parkes and Kalagnanam, 2005). However, in reality there are many factors such as setup costs, variable costs, and capacity constraints that can make the marginal costs vary over units (Jin et al., 2006). Third, almost all research studies on MAORAs assume that score functions are additive or linear in order to easily model a buyer or seller’s preferences. A prerequisite for applying these linear functions is mutually preferential independence among all attributes; a condition that rarely happens.

Still another limitation of all the MAORAs is that they pay too much attention to competition from the same-side-of-the table dynamics (supplier side) but ignore competitive pressures from the across-the-table dynamics (supplier-buyer interactions) (Subramanian, 2010). It should be noted that aside from fixed priced processes, auctions and negotiations are the only two ways by which products and services get transferred in any market economy. It is therefore surprising that these two mechanisms have not been investigated simultaneously.

To deal with the limitations of MAORAs, Teich et al. (2001) have applied the “pricing out” method in their Internet-based hybrid auction named NegotiAuction. This method can be utilized with no need to construct the auctioneer’s value function in an explicit manner. Rather, it puts all the implicit preferences of the buyers into their decision making process by expressing them over multiple attributes in monetary terms. This makes pricing out one of the most popular approaches among decision theories. Using the pricing out approach brings about computational advantages due to the fact that all submitted bids are converted into vectors not matrixes, including only two dimensions – price and quantity. In other words, bidders can submit multi-attribute bids but all non-price attributes are “priced out” before determining the winners for the sourcing contract.

Based on the pricing out approach, Teich et al. (2001) create the NegotiAuction site integrating both auction and negotiation characteristics into a hybrid entity. Specifically, Teich et al. (2001) have devised a system and its relevant web-site for reverse (or forward) auctions aimed at improving efficiency of procurement (selling) processes.

NegotiAuction with the pricing out approach is seen as a means to overcome limitations and difficulties in MAORAs; however, no studies have been so far carried out to empirically investigate the possible adoption of NegotiAuction. This research is aimed at filling that void. Specifically, the objectives are:

1. Construct a conceptual model for NegotiAuction adoption based on integration of the innovation theories;
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