Online Auctions: A study of Bidder Satisfaction

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ABSTRACT
Despite the popularity among millions of users around the globe of selling, bidding for, and buying products using online auction websites, the existing literature provides little understanding of what causes users to choose one auction site over another. One way to examine this is to explore users’ satisfaction with auction websites. The current study extends past literature on user computing satisfaction to evaluate bidder satisfaction from the usage of online auction websites. A greater understanding of bidder satisfaction can facilitate the design of a customer-friendly user interface, thus increasing the effectiveness of auction websites and furthering the success of e-commerce applications and businesses.

INTRODUCTION
An interesting phenomenon of online sales had been the widespread usage of online auction websites that attract millions of users around the globe to sell, bid, and buy anything from baby diapers to a lunch with Warren Buffett. In 2002 alone, a total of US$14.87 billion was transacted on eBay, one of the most popular online auction websites. This website boasts of its success with more than 12 million products listed across 18,000 categories on any given day (eBay 2002).

Online auctions websites serve as a virtual marketplace where bidders who can be geographically dispersed compete to close the deal on auctioned items listed by sellers. At the closing of the auction, the highest bidder emerges as a buyer provided that the bidder meets all the terms and conditions, including the minimum price, generally set by the seller. Online auctions streamline the toughest and often the most
frustrating part of the purchasing process between the buyers and the sellers, i.e. price negotiation. Hundreds of thousands of individuals and small businesses are engaged in selling products via online auctions on a fulltime basis (Adler, et al 2002). Online auctions allow faster and less expensive transactions with no geographical barriers (Lee and Clark 1996).

The popularity of online auctions is likely to grow, as buying and selling is a very basic part of human nature. However, not every website has been able to attract the desired numbers of bidders into the auction process. Successful online auction website design can play a significant role in the overall marketing communication mix. Successful sites complement direct selling activities, present supplemental material to consumers, project a brand image, and provide basic company information and services to their global customers. Auctions are a popular form of price determination in e-commerce due to their simplicity and efficiency (Jin and Wu 2006). Recent statistics showed that 80 percent of highly satisfied online consumers would shop again within two months, and 90 percent would recommend the websites to others. On the other hand, 87 percent of dissatisfied customers would permanently leave their Internet merchants without registering any complaints (Online Auction Survey Summary 2001). This has clear implications for a study focusing on user satisfaction.

According to Wang et al. (2001), effectiveness measures of e-marketing must incorporate different aspects of customer satisfaction to become a diagnostic instrument for practical and theoretical use. A study incorporating these aspects can contribute to the understanding of how e-consumers evaluate different auction websites. It can also help auction website companies investigate ways to improve their websites to attract new bidders and improve upon the bidders’ loyalty to their website (Anderson and Srinivasan 2003). In the long run, customer-centric auction websites that develop and maintain genuine global customer relationship strategies and effectively manage the customer online shopping experience will have a higher probability of surviving in the competitive virtual auction marketplace.

In the authors' view, customer-oriented approaches to evaluating online auction websites have not yet been conducted with a sufficiently rigorous scientific approach, although similar studies exist in evaluating consumer satisfaction of other e-commerce applications. Some examples are the Web Assessment Tool by Selz and Schubert (1997, 1999), the Extended Web Assessment Model by Schubert and Dettling (2002), Web Site Quality by Barnes and Vidgen (2000, 2001a, 2001b, 2001c), and SITEQUAL by Yoo and Donthu (2001). However, the generalizability of such studies to online auctions may be limited or inappropriate. This article seeks to address this gap within the context of consumer-oriented online auction web sites such as eBay, Amazon.com Auctions, and Yahoo! Auctions, by developing and testing an instrument to measure bidder satisfaction. This study aims to develop a multidimensional instrument to better capture multiple aspects of bidder satisfaction resulting from the usage of online auction websites. It also investigates inter-relationships among the various bidder satisfaction dimensions.

**LITERATURE REVIEW**

The concept of auctions has existed for many years, but the research literature on auction theory expanded dramatically after the seminal paper by Vickrey (1961). Since then, a rich set of related literature, both theoretical and empirical, has evolved (e.g., McAfee and McMillan 1987; Milgrom 1989; Kagel 1995; Klepper 1999; Krishna 2002). Auctions use the market mechanism to solve the most difficult business problem, that of pricing the product. With an auction, there is no guesswork for setting up a right price for the product or service, since the price is set by the market (above some minimum). Auction-based pricing is sometimes referred to as "dynamic" or "fluid" pricing, in contrast to set or static pricing mechanisms.

In a traditional marketplace, auctions can be of the open-bid or closed-bid type. Classification into open or closed auction bidding is determined by criteria such as specific allocation rules, revealed number of
bidders, commodities, payment options, and phases of delivery. In an open-bid auction, the bids partially make public each bidder’s private information about the true value of the contract. Each bidder is thus able to learn from the bidding process and adjust their bid closer to the true value of the contract. According to one study, when the bidders have common values, the open-bid auction format produces greater cost savings (Milgrom and Weber 1982).

In a different but somewhat popular classification framework (Huhns and Vidal 1999), traditional auctions can be either single-sided or double-sided. In a single-sided auction, which includes English or first-price open-cry auctions, Dutch auctions, first price auctions, and Vickrey auctions (Maes et al. 1999; Vulkan and Jennings 1998), bidders are uniformly of type buyer or uniformly of type seller. In a double-sided auction (such as the clearing-house and continuous double type), multiple bidders and sellers are admitted at once during negotiations.

Each auction type has advantages depending on the response time, privacy, avoidance of speculation, fairness, and sale price. Other more complex, but less popular types, of traditional auction may include combinatorial auction (de Vries and Vohra 2001) and multi-attribute auction (Bichler 2000). Consumer-oriented auctions focus primarily on price competition in a structured negotiated format of minimal bidding price, incremental bidding price, and "buy now" price options, with well-defined rules for the submission and modification of bids. Popular consumer-auction websites such as eBay and Onsale use an English auction model and share the property that all status information of the bid is conveyed immediately and globally to all participants. The auction progresses to higher bids and closes when no one is willing to exceed the current bid before the auction closing time, making the highest bidder the winning buyer of the item under bid.

In traditional auctioning, the bidder must be present at the site of the auction, and the auction is conducted locally and not publicized, which is not the case with an online auction. Online auctioning helps people to carry out transactions with the convenience of their desktop computer. It also helps to conceal the transaction party’s identity, thus protecting their privacy. Within a particular product category (for example, Men’s wrist watches), bidders may find many brand or quality options (for example, Timex, Seiko, Rolex). Searching for a particular product that matches a bidder’s budget and taste is easy and fast. Once the item is listed for the auction, prospective buyers or the bidders offer successively higher amounts for the item. All bidders are strangers to one another and do not anticipate engaging in future transactions (Katsh et al. 2000). The auction site administers the bidding process and announces the high bidder and price at the conclusion of the auction. The seller dictates the conditions of sale in the auction listing (eBay.com). While there are generally many bidders who compete with one another on price, the merchandise is sold to only one buyer, who is the highest bidder. The winning bidder is expected to pay first and then the seller delivers the goods (Prince 2003). Besides facilitating the auction process, auction websites can also specify the methods of payment that the seller will accept, although the parties may negotiate this and other conditions through e-mail either before or after the auction is completed. As such, the online auction website only facilitates the transaction and never takes possession of either the goods or the payment (Snyder 2000). For their services in facilitating the sales, such websites generally charge a small fee to the sellers based on certain pricing rules.

EBay is the most well-known and popularly used online auction website (Cohen 2002) with 69 million registered users and over 12 million items available for bid every day in hundreds of categories and subcategories. Auction websites, including eBay, require an easy registration process for all the users (sellers and bidders), and most aspects of the transaction (e.g., shipping, payment) are the ultimate responsibility of the respective parties. In summary, these websites offer a virtual marketplace to conduct selling and buying on-line through the auction mechanism. The characteristics of the virtual auction place are an interesting area of research for business professionals and researchers to identify factors that make them successful.
Research on online auctions is not new. Some earlier studies have addressed issues such as the effects of auction formats (Lucking-Reiley 2000), the extent of the winner's curse (Bajari and Hortaçsu 2003), the last minute bidding phenomenon (Roth and Ockenfels 2002), the value of seller reputation (Melnik and Alm 2002) and bidding behavior (Park and Bradlow 2005). In contrast to these past studies, the current study focuses on the interaction issue of the bidders (and buyer) with the auction website.

Online auction websites can be classified as web-based information systems (eBay 2001b) and the bidders (as well as the sellers) as the system end-users. Consequently, the effectiveness of online auction websites can be measured in the context of user satisfaction for the bidders in the current study. Since the 1980s, user satisfaction has been considered an important measure of information systems success (Ives et al. 1983; Bailey and Pearson 1983; Baroudi et al. 1986; Benson 1983; Doll and Torkzadeh 1988; DeLone and McLean 1992). The literature on user satisfaction of information systems is popularly classified into user information satisfaction and end-user computing satisfaction.

User information satisfaction (UIS) refers to the extent to which users perceive that the information system available to them meets their information requirements. User information satisfaction is often used as an indicator of user perception of the effectiveness of a management information system (Bailey and Pearson 1983; Doll and Torkzadeh 1988). As a surrogate measure of information system success in computing environments, UIS measures the success or failure of an information system (Galletta and Lederer 1989). End-user satisfaction is “the affective attitude towards a specific computer application by someone who interacts with the application directly” (Doll and Torkzadeh 1988, p. 261). To measure end-user computing satisfaction (EUCS), Doll and Torkzadeh developed a 12-item survey instrument comprised of 5 variables: content, accuracy, format, ease of use, and timeliness which was a synthesis of the Ives et al. (1983) measure of UIS.

Instruments that assess both general UIS (e.g., Ives et al. 1983, Bailey and Pearson 1983), and application-specific UIS, or end-user computing satisfaction EUCS (Doll and Torkzadeh 1988), have been widely used by researchers (Gelderman 1998; Igbaria 1990; Somers et al. 2003). DeLone and McLean (2004) identify three reasons why user satisfaction has been widely used as a measure of information system success: 1) a high degree of face validity; 2) development of reliable tools for measure, and 3) conceptual weakness and unavailability of other measures. In recent years, several studies have used UIS and EUCS to assess customer satisfaction for online purchasing (Abbott et al. 2000; Cho and Park 2001; Eroglu et al. 2003; Kim and Lim 2001; Kohli et al. 2004; Lam and Lee 1999; McKinney et al. 2002; Reibstein 2002; Shemwell et al. 1998; Szymanski and Hise 2000, Wang et al. 2001; etc.), and to measure website success (Abdinnour-Helm, et al. 2005).

Based on the UIS and EUCS measures, Wang et al. (2001) developed a 43-item instrument to measure customer information satisfaction (CIS) toward websites that market digital products and services. Using exploratory factor analysis on 520 samples, the study identified 21 items to measure customer support, security, ease of use, digital products/services, transaction and payment, information content and innovation.

Collectively, these studies have provided important insights into consumer perception by identifying features of Internet stores that have considerable impact on building customer satisfaction. However, there is still no widely accepted consensus on the satisfaction construct. This provides ample research opportunities to extend past studies in the context of new technologies. Of particular importance for the analysis is that a conclusive set of antecedent variables of consumer satisfaction with Internet shopping is missing. Furthermore, no studies have been conducted to empirically evaluate bidder (and seller) satisfaction for online auction websites. The objective of this paper is to explore the new dimensions in
developing online auction bidder satisfaction using user satisfaction models from the previous studies. Bidder satisfaction is herein defined as the overall affective evaluation a bidder has regarding his or her experience relating to the online auction websites.

RESEARCH FRAMEWORK

A review of the literature on user satisfaction and auction-related literature suggests the proposal of 9 constructs to identify the bidder satisfaction research framework. They are as follows:

1. **Content** refers to the relevance and completeness of website content. Madu and Madu (2002) argue that Internet users rarely read web pages that are detailed. Further, Nah and Davis (2002) argue that consumers want to find the information quickly and with little effort. It is therefore important to deliver concise and relevant information on the product, seller, and transactional terms and conditions on the auction website. Relevant and reliable information can also minimize the concern of fear about the website (Molla and Licker 2001). Based on past studies in e-commerce (Madu and Madu 2002; Katerattnakul 2002), relevant and complete information can help users to make competent and informed bidding decisions and therefore can be considered as a determinant of bidder satisfaction.

2. **Format** of the auction website reflects the information presentation and the layout. As consumers search for products and sellers on the web, the search activity can be influenced by the degree of difficulty and the amount of time taken at a website (Waite and Harrison 2002). It is therefore important to provide relevant information in a format that makes the navigation easy (Molla and Licker 2001). The media richness of the websites in terms of graphics, texts, and layouts can make an auction site attractive and useful (Madu and Madu 2002; Waite and Harrison 2002). A well-formatted website can translate into higher interactivity which can increase effectiveness and efficiency in delivering relevant information to the bidders, and therefore enhance bidder satisfaction (Teo et al. 2003).

3. **Ease of Use** is defined as the degree to which the auction website is “user-friendly” (Doll and Torkazadeh 1988). In the context of auction websites, consumers may assess the websites based on how easy they are to use and how effective those websites are in helping bidders accomplish their bidding and winning activities. An easy-to-use website can enhance bidders' positive impressions of the site (Molla and Licker 2001; Yoo and Donthu 2001; Zeithaml 2000).

4. **Timeliness** of information is the extent to which the auction-related information is updated for bidders (Katerattnakul 2002; Madu and Madu 2002; Kim and Lim 2001). Real-time or timely information helps the bidder know the status of their bid before, during, and after the bidding process (Tiwana 1998; Molla and Licker 2001). According to Madu and Madu (2002), when the website is not updated promptly, the website cannot deliver the expected performance and therefore may provide no added value to consumers. Bidders will experience frustration if they realize that the website is slow in reflecting the bidding status.

5. **Security** of the auction website refers to the ability to protect bidders’ personal information and protecting the bidders from fraudulent sellers. Security has a significant impact on consumer intentions to shop online (Molla and Licker 2001; Limayem et al. 2000). Based on their empirical study, Devaraj et al. (2002) cautioned that security has been a serious issue in online purchases and an impediment to the acceptance of online purchasing. Based on these and other studies on e-commerce security (Madu and Madu 2002; Szymanski and Hise 2000), this study argues that bidder privacy and the security of auction transactions are important for building long term bidder relationships with a particular auction site.

6. **Product Variety** refers to the different product categories (for example, bedroom furniture, shoes and apparel, plasma televisions etc.) and different brands within each product category listed for purchase on the auction website. According to Reibstien (2002), product selection, information, prices, and presentation are important factors for e-business. Different brands listed within each product category can
help bidders evaluate the bidding price among the several listings of the same product and set a maximum bid price for themselves. Product variety can help the bidder in the post-bidding evaluation of the purchase should the bidder win the auction. For a more determined bidder, the bidder can simultaneously bid on multiple listings of the same product from the same or a different seller. Products that are available on auction websites can attract and engage buyers to bid.

7. **Transaction** refers to the post-bidding activities facilitated by the auction website to transfer the merchandise from the seller to the auction winner and payment from the winner to the seller. This factor is similar to the traditional transaction-specific affective response (Halstead et al. 1994; Oliver 1989). Auction websites that have well-established guidelines and protocols to safeguard the economic interest and timeliness of exchange of both the seller and the winner will lead to greater satisfaction for the buyer. It is reasonable to infer that if the seller or auction website creates difficulty for the buyer to obtain the product purchased, buyers and bidders may choose another auction website for future purchases.

8. **User satisfaction** is operationalized in terms of repeat purchases, repeat visits, and user surveys. DeLone and McLean (2004) distinguish between user satisfaction and net benefits for e-commerce based systems in their Information Systems Success Model (ISSM) (DeLone and McLean 1992). User satisfaction is found to be an important dependent variable for measuring customers’ opinions of an e-commerce system and should cover the entire customer experience cycle resulting from system usage (DeLone and McLean 2004). D’Ambra and Rice (2001) also argue that the construct of net benefit, operationalized in terms of cost savings, expanded market, incremental additional sales, reduced search costs, and time savings, captures the balance of the positive and negative impacts of e-commerce on customers.

9. **Net benefit** is the most important success measure, because it captures the balance of the positive and negative impacts of e-commerce on customers, suppliers, employees, organizations, markets, industries, economies, and even society as a whole. The net benefits construct immediately raises three issues that must be addressed: What qualifies as a “benefit”? For whom? And at what level of analysis? (DeLone and McLean 2004). Thus, “net benefit” is probably the most accurate descriptor of the auction website for the buyer in terms of tangible benefits (mainly price paid) achieved when products are purchased through auction.

The causal relationship between user satisfaction and net benefit has been a topic of discussion in several studies. For a comprehensive review and discussion, see DeLone and McLean (2004). This study makes the case that the primary objective of auction buyers is to reap the tangible benefits that are derived from successful bidding. However, the bidding process may not always result in a win for the bidder. Bidder satisfaction is a measure that can be applicable to any bidder regardless of the final outcome of the bidding process, whereas net benefit is a measure that is only applicable to the winning bidders of an auction. Compared to all the bidders, two additional variables seem to be appropriate for the buyer that continues to interact with the auction website after the auction has been closed. Based on the EUCS and CIS, this paper conceptualizes that content, format, ease of use, timeliness, and security are important variables that determine bidder (and winner) satisfaction. The research framework presented also incorporates additional constructs of product variety and transaction that can determine the net benefit that a buyer may enjoy.

**RESEARCH MODEL AND PROPOSITIONS**

The focus of the current study is on the bidders’ overall satisfaction from auction website usage. The usefulness of an auction website for the bidder will depend on an aggregate experience of pre-bidding (i.e. product search), bidding (website interaction), and the post-bidding (transaction of product and payment).
These three activities are applicable to the buyers, whereas the first two activities are applicable to all the bidders. The hypothetical model is presented in figure 1.

In this model, the construct *Products* is used to measure pre-bidding benefits offered by the auction website. *Content, Format, Ease of Use, Timeliness, and Security* contribute to bidding satisfaction regardless of whether the bidder wins the bid or not, and *Transaction* measures the post-bidding benefit. As discussed earlier, it is the authors' belief that *Content, Format, Ease of Use, Timeliness, and Security* are related positively to bidder satisfaction for online auctions. Since the bidders’ use of a particular online auction website is primarily to make a product purchase (planned or unplanned), then *Transaction* and *Products* will be related positively to the net benefit of the buyer. This benefit, in turn, will also be positively related with the bidder satisfaction construct. Accordingly, bidder satisfaction and net benefit are defined to capture the post-bidding overall experience of the buyer. Bidders (and buyer) with high levels of satisfaction may be expected to have higher levels of re-usage intention of the same auction website in the future.

Based on the proposed model of figure 1, the following propositions were tested for the online auction websites:

**P1:** *Content* is related positively with *Bidder Satisfaction*.
**P2:** *Format* is related positively with *Bidder Satisfaction*.
**P3:** *Ease of Use* is related positively with *Bidder Satisfaction*.
**P4:** *Timeliness* is related positively with *Bidder Satisfaction*.
**P5:** *Security* is related positively with *Bidder Satisfaction*.

Figure 1: Research model

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P6: If the bidder wins, *Transaction* is related positively with *Net Benefit*.
P7: If the bidder wins, *Products* is related positively with *Net Benefit*.
P8: Buyer’s *Net Benefit* from the purchase is related positively with *Bidder Satisfaction*

**Structure of Study**
The constructs of the framework in figure 1 were developed based on an extensive review of theoretical and empirical literature in EUCS, CIS and ISSM discussed in the previous section. Additionally, structured interviews were conducted with one home-based e-business owner, two frequent online auction buyers, and one university professor teaching e-commerce related courses in a large size Midwestern US university. As a result, the authors were able to define the domain of the constructs. Next, items to measure each construct were developed. These items use a 5-point Likert Scale. Some demographic items that may require measurement scales are included in the questionnaire.

In the data collection phase of this study, participants in the survey were graduate and undergraduate students enrolled in different universities who use online auction websites on a regular basis. After the data were collected and tabulated, a chi-square test to analyze early vs. late response was conducted. The data analysis includes item purification and factor analysis. Chronbach’s alpha was computed using SPSS software to report the reliability of measured data.

Having established factorial validity and reliability of the instrument, a discriminant validity test was performed to demonstrate that a measure does not correlate very highly with another measure from which it should differ (Venkatraman, 1989). The difference in chi-square values between restricted and freely estimated models provides statistical evidence of discriminant validity (Segars, 1997).

The structural equation model (SEM), using AMOS 5.0 (Arbuckle 2003) was used to analyze the measurement and structural models. Following Gerbing and Anderson’s (1988) paradigm of testing SEM models, the measurement model was tested first, followed by the complete structural model. SEM required an analysis of various mode fit indices.

In SEM, a value of CMIN/df < 2.00 is considered a good fit. The Tucker-Lewis Index (TLI), yet another incremental index for goodness of fit, of closer to 0.95 (Bentler and Hu 1999) represents a good fit between the data and the research model. Similarly, a CFI value above 0.9 for the model is an indicator of a good fit (Bentler and Hu 1992). Values ranging from 0.05 to 0.08 for RMSEA (root mean square error of approximation) are considered a reasonable fit. The CMIN/df, TLI, CFI, and RMSEA indices for the model fit would be reported.

**CONCLUSION**
This study makes a significant contribution in extending past research and developing an instrument for measuring online auction bidder satisfaction. Existing instruments that measure user information satisfaction are geared towards the traditional data processing, end-user computing environments, and general e-commerce sites. This study conceptually defines the key domain of the bidder satisfaction research framework and important constructs.

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