

An Investigation on the Impact of Website Contents on Internet Auction Success*

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This study investigates the impact of website contents on Internet auction success. Based on the marketing concepts of stimuli, consumer behavior, and product involvement, the research model presents the theoretical relationships between the key factors of website contents and Internet auction performance. This study examines particularly four dimensions of website contents including transaction features, auction-specific features, seller's reputation, and information quality, which are deemed to have significant impact on the Internet auction performance. Each dimension of website contents is hypothesized to have a unique impact on a bidder's decision-making, which may vary depending on the bidder's level of involvement in the product. While transaction and auction-specific features serve as necessary components for successful auctions, a seller's reputation and information quality, as parts of satisfactory requirements, acutely affect bidders' decisions, especially those with high involvement to buy the product through a particular auction site. The outcomes of the analysis, in general, support the proposed model. The study results also provide meaningful implications on ways in which auction websites can be improved for both sellers and auction service providers.

Keywords : IS management, Internet Auction, Information Quality, Relevance-accessibility Model, Consumer Involvement

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I . Introduction

The advent of the Internet opens a new window for the commercial market and creates a new type of business trend known as "E-commerce." Among its various venues, the Internet auction has been exceptionally successful and, therefore, recently received a great deal of attention from both practitioners and researchers. In fact, the outcomes from previous studies have generated substantial contributions to understanding diverse issues related to this type of trading, including the roles of the Internet auction in B2B markets and supply chains [Keskinocak and Tayur, 2001; Sashi and Leary, 2002], unique features compared to traditional auctions [Beam and Segev, 1998; Lucking-Reiley, 2000], and trust in sellers' reputations and auctioneers [Liao and Hwang, 2001; McDonald and Jr, 2002]. Despite the increasing interest in this online trading practice, the related research is deemed to be still at a preliminary stage in that the results merely provide limited information regarding mechanisms employed in this new type of auctions.

This study, therefore, takes a more comprehensive approach by identifying and examining critical factors that have outstanding effects on bidders' bidding behaviors. In general, those factors can be classified into four categories: transaction features, auction-specific features, seller's reputation, and information quality. They appear to have stronger impacts on bidders' decision making processes. Further, existent literature on consumer behaviors corroborates that each category has a unique influence on bidders' decision-making depending on the bidder's level of involvement in the

auction item. Among them, transaction features and auction-specific features are particularly important to those bidders who have a medium level of involvement, since those factors can potentially increase their willingness to bid. On the other hand, the bidders who already have a high involvement in bidding are much more likely to be influenced by the sellers' reputation and information quality. Therefore these factors are crucial in persuading bidders to make serious bids and eventually raising their bidding prices. From this observation, sellers' reputation and information quality, therefore, are regarded as satisfactory requirements of auction success.

The contributions of this research can be assessed in three areas. First, this study provides a conceptual framework about how an individual bidder makes bids in an Internet auction site. Since bidding behaviors are interpreted using the theories of consumer behaviors, the proposed research model is to offer more comprehensive perspectives on how auctions work online.

Second, this study supports the positive impact of information quality on the Internet auction. While the result of this study is limited to the Internet auction, its implication supports that high quality of information is positively conducive to web-based information system (IS) success.

Finally, the results of this research provide auctioneers with valuable insight in ways to engage in positive on-line auction experiences. Since this study investigates the degree and the direction of relationships between certain factors of websites and particular dimensions of auction success, sellers can learn which ele-

ments are crucial for favorable outcomes.

II. Research Background

2.1 Internet Auctions

Some recognize the Internet auction as the purest form of capitalism [Goldsborough, 2000]. Indeed, it has shown an astonishing growth rate in terms of its sales and volume in the recent years. In fact, more than 100 Internet auction sites exist, while 50 leading B2B auction sites sold a total of \$2.9 billion in 1999 [Manjorides, 1999]. The Internet auction sales in the U.S. were \$28.2 billion in 2004, and the figure was to exceed \$50 billion by 2007 [Hou, 2007]. Even in terms of both its functions and forms, the online auction has achieved a huge success, covering countless products and services including such non-conventional auction items as investment securities [Deters, 2001], fossils [Simpson, 2000], and HMO premium rates [Beauregard, 2000].

Evidently, the Internet auction inherits certain advantages from traditional auctions [Reza-bakhsh *et al.*, 2006] while offering additional benefits including extensive trading venues beyond geographical limitations [Sashi and Leary, 2002] for less transaction costs [Keskinocak and Tayur, 2001] with more convenience to trade [Lucking-Reiley, 2000] at much lower risk in the operation system [Beauregard, 2000]. The Internet auction sites, however, are not free of some inherent drawbacks generated from the particular nature, common in any online business: increased competition among sellers due to easier entry requirements, no face-to-face contact, and trust issues caused by anonymity

of suppliers [Koufaris and Hampton-Sosa, 2004; Sashi and Leary, 2002]. The greatest risk that buyers may have to take when bidding for online auctions is that they trade products which they have not seen with sellers who they have not met. Internet auctions, therefore, involve high risks for fraud or dissatisfying purchasing. In fact, the bidders have no other choice but to place their bids solely based on the information provided by the sellers. This inherent limitation of Internet auctions connotes that it is important for the sellers to provide bidders with proper information to achieve successful auction performances. This awareness has motivated this research to look into the impact of information quality as well as the other salient factors conducive to successful online auctions.

While recent studies have dealt with various characteristics of Internet auctions [Pinker *et al.*, 2003], only a few works have examined the role of information in the internet auction. Kauffman and Wood [2006], assuming that more informed consumers have higher reference value for the product, examine the impacts of three particular factors: reference value, transaction information, and transaction facilitation. Their analysis shows that, indeed, the information about the product and other bidders' actions significantly affect the bidder's reference value. Baker and Song [2008] evaluate the information about the auction including seller, product, and delivery services as critical factors that may affect the performance of Internet auctions. By using a decision-tree induction technique, their study shows that the information about the seller and delivery services in an auction is the important factor that can determine the price premium.

Gregg and Walczak [2008], extending the previous studies on website quality, examines the impact of E-image on consumers' willingness to transact and the price premium in the Internet auctions. They define the E-image as a comprehensive measurement that represents the professional image of the seller, website appearance, information content, and seller reputation. According to their analysis, the E-image has a significant impact on both auctioneers' willingness to bid and their bidding prices.

This study focuses on the information quality as well as other factors that the past studies consider as important determinants for successful online auctions. Some previous studies (i.e. Kauffman and Wood [2006] and Baker and Song [2008]) use various individual variables to review the information on the auction websites and evaluate how these variables independently affect the auction performance. Unlike their approaches, this study utilizes a rather comprehensive meaning of the auction information covering product, seller, and trading to evaluate the overall impact of information quality on the auction success. Still, the information quality defined by this study is differentiated from such factors as seller's reputation, which may directly influence the auction performance, while some past studies use a single variable that has an extensive meaning including other variables factors [Gregg and Walczak, 2008].

2.2 Consumer Involvement

Ajzen and Fishbein [1980] suggests the theory of reasoned action, claiming that human beings are normally rational and make a system-

atic use of information available to them when making decisions to buy products. Among other theories on consumer behavior [Baker and Song, 2007; Bosnjak *et al.*, 2006], this study applies the concept of reasoned action to explain the behavior of an individual bidder in an Internet auction [Yu and Wu, 2007].

According to the theory of reasoned action, the involvement of an actor is one of significant determinants of active reasoning and problem solving behavior [Ajzen and Fishbein, 1980]. Involvement is defined as "the level of perceived personal importance and/or interest evoked by a stimulus (or stimuli) within a specific situation" [Antil, 1984]. In general, many studies of consumer behavior recognize involvement as the one of the determinants that cause specific buying behaviors [Gao *et al.*, 2004; Koufaris, 2002]. This study considers involvement as a proxy that characterizes distinct bidding behaviors in Internet auctions rather than as a mere cause of buying decisions.

The relevance-accessibility model (RAM) applies the concept of involvement to the model of the buying decision process [Baker and Lutz, 2000]. According to the RAM, a consumer's decision-making process can be classified into three categories depending on the involvement level-optimizing, satisficing, and indifference. When consumers are indifferent to brand alternatives, they tend to select the first brand in favor. For these consumers, advertising with simple affective association with a brand name is good enough to make them buy the advertised product. When the consumers satisfice, their goal becomes to buy the first acceptable brand that they encounter. Advertisements providing evidences of credibility are effective for

this type of consumers. Consumers optimize their decisions when they identify significant brand differentiation and significant negative consequences resulting from non-optimal brand choices. Since this type of consumers deliberately seek information about differences among brand alternatives, advertising needs to convince them of the superiority of the advertised brand over the others.

The research model in this study adopts the RAM as a way to explain bidders' distinct bidding behaviors in Internet auctions. However, the major interest of this study contains only two groups of bidders among the three groups of the original RAM: optimizing and satisficing. The focus of this study is narrowed down to bidders who actually make bids rather than potential bidders who may make bids online.

2.3 Information Quality

Information System (IS) researchers view information quality as an antecedent of IS success and end-user satisfaction. The measurement of information quality is by nature associated with the perception of information users. Delone and Mclean [1992] consider information quality to be one of the six major dimensions of IS success such as accuracy, meaningfulness, and timeliness. Among many different ways in which online information quality is classified in the past studies, most of them include common categories such as accuracy, precision, timeliness, reliability, completeness, and relevance [Iivari and Koskela, 1987; Pitt *et al.*, 1995; Zmud, 1978].

In the past studies on the Internet auctions, the information generates multiple implications

ranging from product information [Baker and Song, 2008], transaction information [Kauffman and Wood, 2006], to delivery information [Baker and Song, 2008]. As such, the information quality can be inevitably defined in diverse ways; therefore, this study adopts simple definition of information that describes the product, seller, and transaction in the auction website. The information quality in this study implies the amount and variety of information, which are rather objectively measurable [Palmer, 2002].

This study proposes that the quality of information posted in the auction websites has a significant influence on the bidders' decision making behaviors [Baker and Song, 2008; Kauffman and Wood, 2006]. According to the relevance-accessibility model, the bidders who seriously consider buying the products and try to optimize their bidding decisions on them would deliberately seek the information about the product, seller, and transaction. Since the auction websites are the unique source of information for the bidders, the quality of information available in the auction websites is a crucial determinant for serious bidders, while those less serious bidders might, of course, be influenced by other factors than information itself. Therefore, information quality is deemed a satisfactory requirement for the Internet auction to be successful with high ending price.

III. Research Model

3.1 Conceptual Framework

This study investigates the auction mechanism reflecting behaviors of bidders in Internet auctions, which are bidders' reactions to stim-

uli or website contents when they make bidding decisions. The factors of websites are classified into four categories: transaction features, auction-specific features, information quality, and seller's reputation.

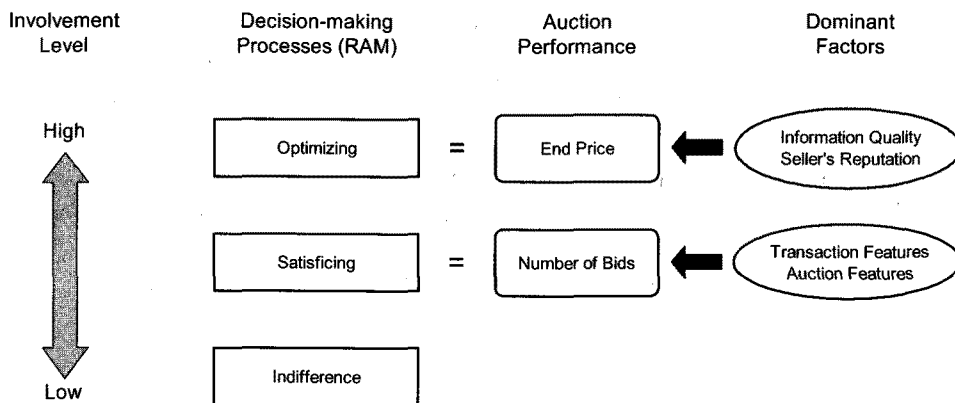
These four categories are selected based on the review of past studies about the Internet auction [Bland *et al.*, 2007; Gregg and Walczak, 2008; Hou, 2007; Kauffman and Wood, 2006; Mithas and Jones, 2007; Resnick *et al.*, 2006; Song and Baker, 2007; Stern and Stafford, 2006; Walczak *et al.*, 2006]. Four categories contain variables that most commonly appear as determinants of the Internet auction performance in the literature. In particular, only the factors that either seller or auctioneer can control belong to four categories [Baker and Song, 2007].

It is assumed that the bidders may have different levels of involvement in products posted in Internet auctions so that they show different responses to the website contents provided by sellers and/or auction service providers. Therefore, this study claims that a certain type of Internet success can be obtained by providing a particular group of bidders with specific fac-

tors of the website contents that are relevant to the interest of that group.

<Figure 1> shows provisional relationships between each group of bidders defined by their levels of involvement and the dominant factors of website contents. According to the RAM, bidders can be grouped into three categories depending on their levels of involvement associated with products posted in the auction websites. The largest group is composed of potential bidders who may make bids but are not particularly interested in the products posted in the auction websites compared with the identical products sold at other places such as retail stores. Since this study focuses on bidders who actually make bids, the group of bidders who may make bids in the future is beyond the scope of this study.

The group of consumers who satisfy their bidding decisions comprises those who actually make bids. Since bidders in this group generally buy the first acceptable items, they are mainly interested in whether the product can be purchased at least at their minimum levels of satisfaction in terms of the minimum price



<Figure 1> Three Groups of Bidders, Associated Auction Success, and Dominant Factors

that they are willing to pay, shipping method, convenience to trade, among others. The factors of website contents related to transactions and auction-specific features, therefore, are considered to have significant impacts on bidding decisions. The success of auction for this group of bidders is measured based on the total number of bids.

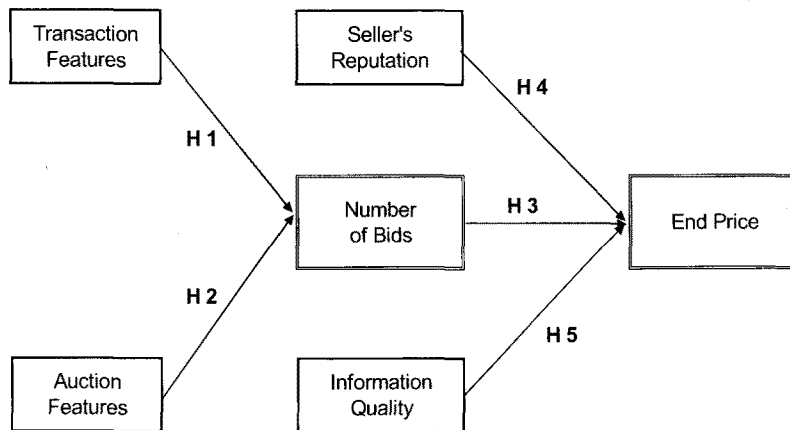
The smallest group of bidders is composed of those who try to optimize their decisions by actively seeking information. Their intention is not only to bid for the sake of winning but actually to buy the specific products in the auctions, so they deliberately seek information that ensures their potential benefits when they win the auctions. Hence, specific information that reveals superiorities of products, trades, and transaction is important to these bidders. Therefore, information quality and seller's reputation are the key influential factors for the group of serious bidders. Since the bidders who belong to this group have serious intentions to buy the products, they are likely to increase the prices. In this regard, the end price represents the auction success for this group.

3.2 Proposed Model of Website Contents and Auction Success

<Figure 2> presents the model proposed by this study. The transactions and auction-specific features of the website contents have significant impacts on Internet success associated with the group of satisficing bidders, and success of the auction is measured by the total number of bids. On the other hand, seller's reputation and information quality are critical factors to the group of serious bidders. Auction success is measured as the end price in this case. The end price is assumed to be correlated with the total number of bids.

The first considered category of factors of the website contents is transaction features. How efficiently and smoothly the transaction is operated during the auction and after closing the auction is the major concern of bidders. Shipping options, payment method, methods to contact with the seller, optional services, and return policy belong to this category.

Auction-specific features are unique characteristics of Internet auctions. Buy-It-Now [Hou,



<Figure 2> Relationship Between Auction Success and Factors of Website Contents

2007], reserve price [Bland *et al.*, 2007], and links to similar items provide special services that cannot be found in any other types of trades than Internet auctions, and they serve bidders for the convenience of using Internet auctions.

Seller's reputation is closely associated with trust [Kim and Ahn, 2006]. Since every winning bidder is exposed to the risk of fraud in Internet auctions, the trust in sellers to deliver products as they promise is surely an important factor influencing the success of an Internet auction [Bajari and Hortacsu, 2004; Walczak *et al.*, 2006]. The measure of seller's reputation is the ratings based on both buyers and sellers' evaluation. Most Internet auctions enable both buyer and seller to evaluate each other's performance after the transaction and post results of rating on their auction websites.

Information quality of the website contents implies the amount and variety of information that is provided in the auction websites by a seller or an auction service provider. Information defined by this study is rather objective reports about the product, seller, and seller which may represent superiorities of the product or specific benefits that bidders would receive when they win the auction [Palmer, 2002].

In order to obtain the pure impact of the elements of website contents on the Internet auction success, the other factors that may significantly affect the auction performance are controlled as the control variables in the analysis. Based on the review of the past studies about the Internet auction performance [Bajari and Hortacsu, 2004; Halcoussis and Mathews, 2007; Hou, 2007; Lucking-Reiley, 1999], four factors are chosen as the control variables. These

control variables are the origin of product, seller's status, duration of the auction, and day when the auction ends.

Auction success, as a dependent variable, is measured in two ways: the number of transactions or bid price. Transaction-related auction success indicates the level of activeness in transactions occurring during the auction. This variable is the total number of bids made by every bidder [Nikitkov, 2006]. Another measurement for auction success is related to the end price [Baker and Song, 2007]. This variable represents the seller's benefit as a monetary value. The end price of the auctioned item also represents the auction service provider's economic benefit, because the fee charged by the auction service provider is calculated based on the end price in most Internet auctions.

In the proposed model, the level of involvement that each bidder possesses is configured by two variables representing Internet auction success. A high end price implies that a bidder has a strong intention to buy the product so that they attempt to raise the price of bids enough to buy that product. In this case, the bidder has a relatively high level of involvement in the product posted on the auction website.

When the bidders participate in the auction and make multiple bids for the product, each bidder obviously shows a certain level of intention to buy the product. However, the action of bidding itself is a hardly sufficient indicator of their strong intention to actually buy the product in the end, because obviously bidding does not necessarily guarantee winning the auction. Therefore, a large number of bids may denote that the bidders have a relatively medium or low level of involvement in the product.

3.3 Hypotheses

Based on the research model, the following hypotheses are tested in this study.

Hypothesis 1: The Internet auction with more transaction options has more bids.

The above hypothesis is to examine the relationship between various transaction features and auction success (the number of bids). Bidders with a certain level of involvement make bids for products they find acceptable. Hypothesis 1 posits the convenience of transactions as a standard for acceptability at the stage of decision-making on bidding. By implication, when bidders recognize the convenience of transactions for a certain Internet auction such as more shipping options, more payment methods, more ways to contact with the seller, more optional services, and more clearly declared return policy, they place more bids on that auction [Andrews and Benzinger, 2007; Baker and Song, 2007; Nikitkov, 2006; Song and Baker, 2007]. However, convenience itself is not strong enough to make auctioneers raise their bidding prices to actually win the auction.

Hypothesis 2: The Internet auction with more various auction-specific features has more bids.

An Internet auction is also equipped with several unique features that facilitate trades. Hypothesis 2 indicates that some features (such as Buy-It-Now option) may increase bidders' intentions to bid [Anderson *et al.*, 2008; Hou, 2007], while the others (such as the reserve

price) may have the opposite effects [Bajari and Hortacsu, 2004; Bland *et al.*, 2007; Reiley, 2006]. The second hypothesis implies that positive auction-specific features result in boosting bidders' intention to place more bids, but they do not necessarily lead directly to raising bidding prices.

Hypothesis 3: The Internet auction with more bids ends with higher price.

Hypothesis 3 indicates that an auction is likely to end with a higher price as the bidders make more bids on the auction. This hypothesis is based on the classical auction pricing theory and behavioral theory [Stern and Stafford, 2006]. eBay applies ascending price English auctions where the price becomes higher as more bidders participate in the auctions. According to the behavioral theory, the bidders keep increasing the prices by making more bids as they are stimulated by the reference group behavior with the other bidders who increase the prices. Therefore, auctions with more bids are expected to end with higher prices.

Hypothesis 4: The Internet auction with higher seller's reputation ends with higher price.

Hypotheses 4 implies a relationship between seller's reputation and the end price. Due to the risk of fraud in Internet auctions, the seller's reputation is a critical factor that bidders would consider when they make decisions on bidding. The past studies already support the significant impact of the seller's reputation on the Internet auction performance [Hou, 2007;

Resnick *et al.*, 2006; Song and Baker, 2007]. Therefore, good seller's reputation serves as a determinant factor to lead bidders to buy the product by raising the price of bids to a sufficient level to win the auction.

Hypothesis 5: The Internet auction with higher Information quality ends with higher price.

As the proposed model indicates, bidders who have a high level of involvement actively seek any information that tells the superiority of products or benefits resulted from trades. In general, better informed consumers are more likely to change their reference value of the products [Kauffman and Wood, 2006]. In particular, since the contents of auction websites are the unique source of information about the product, seller, and transaction to the bidders in the Internet auctions, the auctions that provide richer quality of information in their websites are supposed to be more highly appreciated by the bidders. Quality of information provided by sellers and auction service providers are, in fact, critical factors that bidders consider when making decisions on their bids [Baker and Song, 2007]. Hypothesis 5 indicates that high information quality encourages bidders to seriously bid for products and even raise the price to the sufficient level to win the auction in the end.

IV. Methodology and Analyses

4.1 Operationalization of Theoretical Concepts

When detailed scales are measured in the

empirical test, this study uses a set of objective measurements of data collected from auction websites. Most scales of variables are measured by either counting paragraphs or checking existence of items representing specific contents provided by sellers or the auction service provider. Since this study uses purely secondary data obtained by counting subjects from the auction websites, the most scales have integer values. <Table 1> shows the details of scales used in this study.

Internet auction success is measured by two different scales: the end price and the total number of bids. The end price is the final price of a product item posted on the Internet auction website when the auction is complete, and it directly represents the seller's profit. The total number of bids made by all bidders who participate in the auction indicates the amount of transactions that the Internet auction website achieves.

Transaction features that serve as independent variables are measured by five scales: shipping options, payment methods, total contacts, optional services, and return option. These elements of the Internet auction websites indicate the functions that support the transaction process of the Internet auctions. Normally, most Internet auctions provide more than one option, from which buyers can choose when they trade products with sellers. Shipping options include ground shipping, 7~10 day UPS, 2~3 day express, and international shipping. Regular payment methods are Paypal, credit card, direct deposit, bank check, and personal check. Most auction websites post information about how bidders can contact with the seller when they have questions about the products

or when they need to reach the seller for transactions. E-mail address, telephone number, fax number, and mailing address are considered options of contacts. Some sellers provide optional services for the product, from which a bidder can choose after the auction is finalized. A warrantee is a typical example of an optional service, often offered when the seller is a merchant. The return option indicates whether the buyer can return the purchased item af-

ter closing.

Auction-specific features indicate special features provided by a seller to facilitate auction processes on the Internet, and these features may not be found in offline auction sites. A seller can offer a Buy-It-Now option with a pre-determined price. The auction ends immediately when a bidder decides to pay that price. Since the price of Buy-It-Now gives bidders the idea about the maximum price that the seller

<Table 1> Scales of Variables and Measurements

		Label	Values	Definition
Dependent Variables		End Price	Dollars	Final price when the auction ends
		Number of Bids	Integer	Total number of bids made by all bidders
Independent Variables	Transaction Features	Shipping Options	Integer	Total number of shipping options provided by the seller
		Payment Methods	Integer	Total number of payment methods that the buyer can choose
		Total Contacts	Integer	Total number of ways to contact with the seller
		Optional Services	0 or 1	Whether optional service (like warrantees) is provided (1) or not (0)
		Return Option	0 or 1	Whether return is possible (1) or not (0)
	Auction-specific Features	Buy-It-Now	0 or 1	Whether Buy-It-Now option exists (1) or not (0)
		Reserve Price	0 or 1	Whether reserve price exists (1) or not (0)
		Links to Others	0 or 1	Whether the seller posts links to other products (1) or not (0)
	Seller's reputation	Positive Ratings	Integer	Number of positive ratings of the seller in history
		Negative Ratings	Integer	Number of negative ratings of the seller in history
	Information Quality	Seller Description	Integer	Number of words describing the seller
		Shipping Costs	Integer	Number of words describing the shipping costs
		Compare w/ Retail Price	Integer	Number of words comparing the suggested price with the retail price
		Product Specs	Integer	Number of words describing the product specifications
Product Condition		Integer	Number of words describing the product condition	
	Product Pictures	Integer	Number of pictures containing the product posted by the seller	
Control Variables		prodorigin	0, 1, or 2	Origin of the product (New:0; Refurbished: 1; Used: 2)
		merchant?	0 or 1	Whether the seller is merchant (1) or not (0)
		Daylength	Integer	Number of days that the auction is held by the seller
		enddayweek	0 or 1	Day when the auction ends is during weekends (0) or weekdays (1)

expects from the auction, the Buy-It-Now option may have a positive impact on the auction success [Anderson *et al.*, 2008; Hou, 2007].

The seller can also decide a reserve price, which is the minimum price at which the seller is willing to sell the product. Once the seller sets a reserve price, the actual transaction is made only when the end price is greater than or equal to the reserve price. Since the reserve price is unknown to bidders, it seems to negatively affect auction success [Bajari and Hortacsu, 2004; Bland *et al.*, 2007; Reiley, 2006]. Some auction websites contain links to other product items that are sold by the same seller on the auction websites. Links to other product items may have a positive impact on auction success because they offer convenience of trading to bidders and also increase seller's credibility.

Seller's reputation is considered a quite influential factor in the Internet auctions where the incidents of fraud prevail. The seller's reputation is evaluated with two scales: positive ratings and negative ratings [Hou, 2007; Resnick *et al.*, 2006; Song and Baker, 2007]. The most Internet auctions utilize a seller rating system to evaluate a seller based on the trade history. In this system, the buyer can evaluate the seller by deciding a positive or negative rating. Therefore, seller's reputation can be measured by the number of positive ratings and the number of negative ratings made by buyers who had trades with the seller [Song and Baker, 2007].

Information quality, which represents the amount and variety of information contained in the website contents, is measured with scales indicating key issues in trades, which are product, transaction, and price. Scales for informa-

tion quality are measured by counting the number of words in descriptions posted on the auction website [Nikitkov, 2006], and they imply a level of information richness that is provided to bidders. Posting pictures of a product item is a strong tool that shows specifications and conditions of the product [Bland *et al.*, 2007; Stern and Stafford, 2006], and the number of product pictures is considered to be one scale representing information quality. Some auction websites compare prices against retail stores' in order to underline cost saving that the bidders may receive by buying the product from the Internet auctions.

In order to obtain pure impacts of independent variables addressed in the model, this study controls some factors by setting them as control variables. One of the control variables is the origin of a product that indicates whether the product is new, used, or factory refurbished [Hou, 2007]. Whether the seller is a merchant or not may affect seller's credibility [Andrews and Benzing, 2007]. As the duration of an Internet auction extends, more bidders participate in the auction and more bids are made [Halcoussis and Mathews, 2007; Lucking-Reiley, 1999]. Usually, more bidders participate in Internet auctions during weekends when most people find flexible time, and a large number of bids are made at the time close to the end of an auction [Bajari and Hortacsu, 2004]. The last control variable is whether the auction ends during weekends or weekdays [Hou, 2007].

All scales used in this study as independent and dependent variables are chosen based on the careful review of past studies that examine the impact of determinant factors on the Inter-

net auction performance [Bland *et al.*, 2007; Gregg and Walczak, 2008; Hou, 2007; Kauffman and Wood, 2006; Mithas and Jones, 2007; Resnick *et al.*, 2006; Song and Baker, 2007; Stern and Stafford, 2006; Walczak *et al.*, 2006]. The selected scales most commonly appear as independent or dependent variables in those past studies. In addition, according to the observation on the past studies that evaluate information quality by measuring website contents (number of words or length) [Kauffman and Wood, 2006; Nikitkov, 2006; Palmer, 2002], this study may moderately confirm the content validity and external validity of scales used in the proposed model.

4.2 Design of Study

To examine the proposed model, this study conducts the empirical analysis. Data has been collected from one of the biggest online auction service providers, eBay.com. The MP3 player, one of the most popular items in Internet auctions, is chosen for the study, and the single product model and the manufacturer are predetermined to eliminate the potential impacts of price difference and consumer's involvement related to the product value on the research outcomes. The specified model of the

products sold between July and August in 2008 is the subject of data collection. Total five hundred and two auction websites are observed and analyzed.

The analysis is conducted on the collected data to test hypotheses and examine overall impacts of website contents on auction success. Since it is required to analyze complex multi-relationships between independent variables and dependent variables, the path analysis is used to test the hypotheses.

For the purpose of the path analysis, measured scales are transformed into their associated variables as <Table 2> shows. Since the scales associated with the transaction features are not much different in values, they are simply averaged. Among scales associated with the auction-specific features, the reserve price may have a negative impact on the auction success, and therefore, it has a negative sign in the summation to represent the value of the auction-specific features. The variable of seller's reputation is represented as the positive ratings minus negative ratings. Among scales associated with the information quality, the number of product pictures has a quite different value compared with the other scales. In consideration of average number of words measured in the other scales and the relative

<Table 2> Values of Independent Variables

Independent Variables	Values used in Path Analysis
Transaction Features	TRANSACT = (Shipping Options+Payment Methods+Total Contacts +Optional Services+Return Option)/5
Auction-specific Features	AUCTION = (Buy-It-Now - Reserve Price+Links to Others)
Seller's Reputation	SELLER = (Positive Ratings - Negative Ratings)
Information Quality	QUALITY = (Seller Description+Shipping Costs+Compare w/Retail Price +Product Specs+Product Condition+100×Product Pictures)/6

importance, the number of product pictures is weighted with 100 in simple averaging to represent the value of information quality.

4.3 Results of Analyses

The path analysis was conducted on the data collected from eBay.com to examine the proposed model, and the outcome is described in <Figure 3>. The results of the path analysis indicate that the transaction features and auction-specific features have significant impacts on the number of bids at $\alpha = 0.05$. In particular, the directions of these relationships indicate that the number of bids increases as the website offers more transaction features or auction-specific features. These outcomes support Hypotheses 1 and Hypotheses 2.

The relationship between the number of bids and the end price is, as expected, positive and significant at $\alpha = 0.05$. It implies that the auctions with more bids are likely to end with the higher price. This result supports Hypothesis 3.

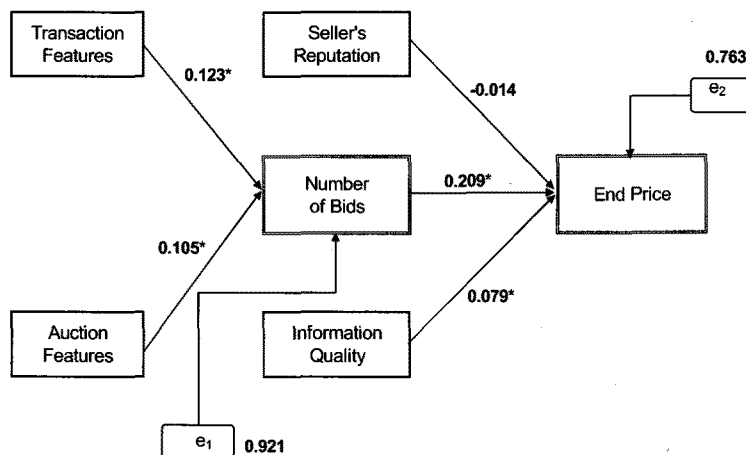
The path analysis reveals that the seller's

reputation and the end price do not have a significant relationship at $\alpha = 0.05$. Although the sellers' reputation may be highly evaluated by their past buyers, their auctions do not necessarily end with the high price. This result does not support hypothesis 4.

The information quality has a significantly positive impact on the end price at $\alpha = 0.05$. This outcome implies that the auctions with higher information quality are likely to end with the higher price, and it supports Hypothesis 5. <Table 3> shows the detailed outcomes of the multiple regressions conducted for the path analysis.

V. Discussion and Implications

In general, the results of the path analysis conducted in this study support the proposed model of bidders' behaviors in the Internet auction. The significantly positive impacts of transaction features and auction-specific features on the number of bids indicate that these two features induce potential bidders to place bids.



<Figure 3> Path Analysis Result(* Significant at $\alpha = 0.05$)

<Table 3> Multiple Regression Result

Independent variables	Dependent variables			
	Number of Bids		End Price	
	Beta	p-value	Beta	p-value
QUALITY	-	-	0.079	0.025
TRASACT	0.123	0.007	-	-
AUCTION	0.105	0.047	-	-
SELLER	-	-	-0.014	0.702
Number of Bids	-	-	0.209	0.000
prodorigin	-0.179	0.000	-0.564	0.000
merchant?	0.106	0.050	0.044	0.250
daylength	-0.147	0.001	-0.031	0.414
enddayweek	-0.006	0.881	-0.080	0.022
R-square	0.152	-	0.418	-
Adjusted R-square	0.141	-	0.410	-
F	14.527	0.000	50.662	0.000

The analysis shows a significantly positive relationship between the information quality and the end price, implying that the high information quality enables the bidders to raise the price to win the auctions. When the high end price is considered to be the ultimate success that the most sellers expect from their Internet auctions, the overall outcome of the analysis supports that transaction and auction-specific features serves as necessary conditions for the auction success. Meanwhile, the information quality is a satisfactory condition for the auction success.

The result of this study provides meaningful implications about how to effectively design the auction websites to the sellers and the auction service providers. Since more transaction and auction-specific features induce the bidders to place more bids and a higher number

of bids is likely to lead to higher end price, the sellers need to include more features in their auction websites to attract more bids. This can be achieved only when an auction service provider designs the template of the auction website with many options from which the sellers can choose in the areas of shipping, payment, contacts, and returns, among others. In addition, sellers should carefully consider the auction-specific features like Buy-It-Now, reserve price, and links-to-others when they design auction websites, because these features can significantly affect the number of bids. The auction service provider should also carefully consider other features that can be potentially added to the auction website template in order to make it more attractive and user-friendly to both sellers and bidders.

While the auction website with more transaction and auction-specific features can attract more bids, this may not guarantee higher end prices, which represents the ultimate auction success. To this end, it is important for the sellers to provide good quality of information about the product, seller, and price. When bidders have access to detailed information, as shown in this study, they are more likely to bid higher prices. This also indicates that web designers need to take heed of this point when designing auction websites in line with auction service provider's efforts to prepare the template that supports high information quality of auction website, which is clearly an essential component for the auction success.

Meanwhile, the seller's reputation, regarded as another potential condition for the auction success, is revealed to have no significant impact on the end price. To investigate into the

seller's reputation, I reviewed seller evaluations provided by eBay.com. Items included in the survey were feedback scores and more detailed average ratings than simple binary ratings (positive and negative). However, none of these seller evaluations show significant impacts on the end price either. To account for this unexpected result, I suspect the quality of the seller evaluation system provided by eBay, which may not turn out to be conducive to raising bidding price. [Bajari and Hortacsu, 2004; Kauffman and Wood, 2006]. This is because, as many past studies claim [Andrews and Benzing, 2007; Hou, 2007; Resnick *et al.*, 2006], the seller's reputation has been regarded as one of the most critical factors that bidders consider when they make decisions to bid in the Internet auctions. From this outcome of this study, I am reluctant to conclude that a seller's reputation is not important for the auction success. Instead, this study finds ample room to speculate that the current auction service and quality of information need further improvement especially in the ways in which sellers are being evaluated so that bidders find the information about seller's reputation useful and reliable.

VI. Conclusion

This study examines the important elements of Internet auction websites that have significant impacts on the Internet auction success. This study investigates into the four categories of factors of website contents that have been identified by previous research: transaction features, auction-specific features, seller's reputation, and information quality. These are considered the key elements that influence bid-

ders' decision-making on their bidding. Based on a number of theories in consumer behavior, this study proposes that transaction features and auction-specific features serve as the necessary requirements for an ultimate auction success, and the bidders with a medium level of involvement are especially more sensitive to these two aspects of online auction sites. For the bidders who have a high level of involvement, seller's reputation and information quality serve as the satisfactory requirements for auction success.

The overall result of the path analysis supports the proposed model. The outcomes of this study provide practical implications that can help the sellers and auction service providers design the auction website more effectively to improve the performance. While the sellers need to provide many options for basic services for the transactions including shipping, payment, contacts, and return policies, as well as auction-specific features like Buy-It-Now, reserve price, and links-to-others in order to induce the bidders to place bids, the auction websites should also contain sufficient and reliable information about product, seller, and price to boost high end price.

This study has faced some limitations that should be heeded for future studies. First, the analysis is conducted on only the secondary data provided by eBay. With this limited resource, the bidders' involvement levels had to be indirectly configured through the Internet success factors. To strengthen the validity of the research on the impact of dominant factors pertinent to the level of involvement, as this study intends to do, it is important for future studies to conduct surveys to acquire first-hand

data from the bidders in order to accurately assess their perceptions on auction websites, intentions to place bids, and involvement levels [Bland *et al.*, 2007]. Second, the validity and reliability of the variables used in the proposed model are not tested through the statistical analysis. Since this study uses the secondary data without any modification and the scales represent such different values as binary integers, the statistical analysis is not applicable to test its validity and reliability. Thus, for verification of the content and external validities of

the variables, this study relies on the literature review. To remedy this shortcoming, the future study should look into better ways for appropriate modification of the variables or the design of proper scales for surveys.

Finally, in this study only one type of product is employed for the analysis of the proposed model in order to exclude the impact of the price difference on the involvement level. To generalize the outcomes of the analysis, more than one type of products should be examined [Song and Baker, 2007].

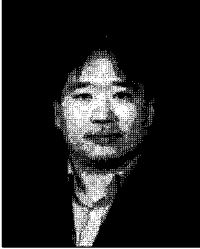
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