

FACTORS INFLUENCING ONLINE AUCTION SELLERS' INTENTION TO PAY: AN EMPIRICAL STUDY INTEGRATING NETWORK EXTERNALITIES WITH PERCEIVED VALUE

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ABSTRACT

Despite the popularity of online auctions as a new e-commerce operating model, few studies have explored why sellers intend to pay for the services of particular auction sites, especially while other free auction services exist. Developed on the basis of the theory of perceived value, this study includes network externalities in seller perceptions and explores why sellers intend to pay for these services. This study employed structural equation modeling (SEM) to investigate a research model based on a survey of 336 online sellers. The results show that perceived network externalities affecting sellers' intention to pay are composed of perceived benefits (usefulness and social benefit), perceived costs (searching cost, monitoring cost, and adapting cost), and perceived value of selling through the website auction. Another valuable finding was that expert sellers and non-expert sellers differ in their perceptions of the value of online auctions. The implications of these findings are discussed.

Keywords: perceived value, network externalities, intention to pay, online auction

1. Introduction

The rapid development of consumer-to-consumer (C2C) e-commerce in the past few years, especially online auctions, has substantially increased the number of online auction sellers [Rauniar et al. 2009; Sinclair 2007]. The e-commerce services provided by online auctions are typically free to sellers. Recently, however, some C2C sites have begun asking sellers to pay for e-commerce services, which has become a vital revenue source [Gupta & Mela 2008]. Most studies examining these sites, however, have analyzed only the buyers' intention to pay for website services, rather than that of the sellers. Therefore, this study investigated factors affecting sellers' intention to pay when using online auction services.

Recent research has found that network externalities and customer value are two critical factors affecting the success of online auctions [Gupta & Mela 2008]. Network externalities, including various commodities and numbers of buyers and sellers, have become key determinants of online auction success. Many scholars believe that network externalities are crucial to the survival of digital industries such as e-commerce [Gupta & Mela 2008; Schmitz & Latzer 2002], and online community sites [Hong & Kim 2004; Westland 2010]. Some scholars have indicated that network externalities are essential for e-commerce companies, such as eBay, because network externalities determine the popularity of their websites [Schmitz & Latzer 2002]. The number of sellers and buyers must reach a critical mass to strengthen the benefits for each party. Although network externalities have nothing to do with the intrinsic value of the auctioned product, the overall network ecology value determines C2C e-commerce success. Members perceive the positive value of the website and, hence, are more willing to use its services [Kim & Lee 2007; Lu & Hsiao 2010].

In addition to network externalities, perceived value has been found to affect customer behavior directly [Chen & Chen 2010; Gupta & Kim 2007; Kim et al. 2007; Lu & Hsiao 2010]. Dodds and Monroe [1985] maintained that

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perceived value was a trade-off between perceived benefits and perceived costs. Scholars have found that the perceived benefit of certain merchandise outweigh the perceived cost and positively relate to customers' intention to pay [Chu & Lu 2007; Dodds et al. 1991; Sweeney et al. 1997]. Kim et al. [2007] included both elements in exploring the mobile Internet's influence on user behavior and proposed a value-based model that included the cost element and presented the intention to pay as a comparison of benefits and costs. Based on these findings, this study included both positive (perceived benefit) and negative (perceived cost) influences to examine online auction sellers' perceptions of a website's value.

Researchers have hypothesized that the ability of e-commerce companies to manage external behavior may be more crucial than their ability to manage product features [Gupta & Mela 2008; Hong & Kim 2004; Schmitz & Latzer 2002]. This is the so-called "outside in" management strategy. E-commerce companies must first work on network externalities (outside) and then on perceived value (in). Katz and Shapiro [1985] suggested that the value or efficacy users obtain from their purchase increases as the number of users increases. In other words, the more popular a certain digital service is, the greater the value perceived by consumers who purchase the service [Kim & Lee 2007; Kuo et al. 2009].

Except for a few auction websites (e.g., Yahoo-Kimo and Ruten) that charge sellers for the cost of commercial activities (e.g., insertion fee and final value fee), most auction websites in Taiwan provide sellers with a venue to sell their items free of charge. The Yahoo Kimo Auction site, however, still leads the auction market in Taiwan in both transaction volume and hit rate by web users, according to Zhan [2008]. Such a phenomenon is intriguing, and has inspired the current study's investigation into why sellers choose auction websites that charge instead of those that offer free services. This study proposes a complete and effective framework to explain sellers' understanding of online auctions and their intention to pay for its services, as well as to analyze factors affecting sellers' intention to pay. The conclusions and implications of this study can serve as a valuable reference for online auction companies as they generate management decisions.

2. Research Model and Hypotheses

This study explored factors affecting sellers' intention to pay for services when free services are available. First, we assumed that perceived value positively relates with intention to pay. Many studies have supported this assumption [Chu & Lu 2007; Dodds et al. 1991; Lu & Hsiao 2010], which maintains that the greater the perceived value is, the greater the intention to pay.

To explore the antecedents of perceived value, this work adopted the Monroe and Krishnan [1985] perceived value model, which proposes that two factors determine perceived value: perceived quality, which is the benefit obtained by consumers; and perceived sacrifice, which is the cost consumers must pay. The perceived value model has been widely used in studies examining customers' paying behavior [Chu & Lu 2007; Dodds et al. 1991; Kim et al. 2007; Sweeney et al. 1997]. This work involves a slight modification of this model to reflect the different situations being examined. For instance, this study used the intrinsic and extrinsic cues of product values suggested by Zeithaml [1988] as criteria for evaluating auction websites. Chu et al. [2005] and Paul [2001] have found that when there are insufficient intrinsic cues or when intrinsic cues are difficult to discern, consumers turn to a product's extrinsic cues, such as price and brand name.

Auction websites not only sell products but also allow people to connect, thereby empowering the entire network ecology. As previously mentioned, managing external cues has been determined to be more crucial than managing website content [Gupta & Mela 2008; Hong & Kim 2004; Schmitz & Latzer 2002]. Therefore, this study considers network externalities as extrinsic cues and maintains the close association between extrinsic cues and sellers' perceptions of benefits and costs. This study integrated network externalities into the perceived value model.

Figure 1 presents this study's research model, developed based on network externalities and the perceived value model.

2.1. Intention to Pay and Perceived Value

Perceived value is defined as "the consumer's overall assessment of the utility of a product or service, determined by a consumer's perceptions of what is received and what is given" [Lu & Hsiao 2010]. From the consumer choice perspective, consumers estimate the value of the choice product or service by considering all relevant benefit and cost factors [Constantiou & Mahnke 2010; Kleijnen et al. 2007]. Perceived value represents an overall estimation of the utility of a product or service [Zeithaml 1988]. In this study, perceived value is the seller's overall assessment of an auction website service utility based on perceptions of what is received (benefits) compared to what is given (costs). Considerable research has verified perceived value as one of the important factors that affect customers' using and buying an information technology (IT) service [Kim et al. 2007; Lu & Hsiao 2010; Turel et al. 2007]. Hence, we hypothesize that:

H1: Perceived value positively affects a seller's intention to pay for an auction website.

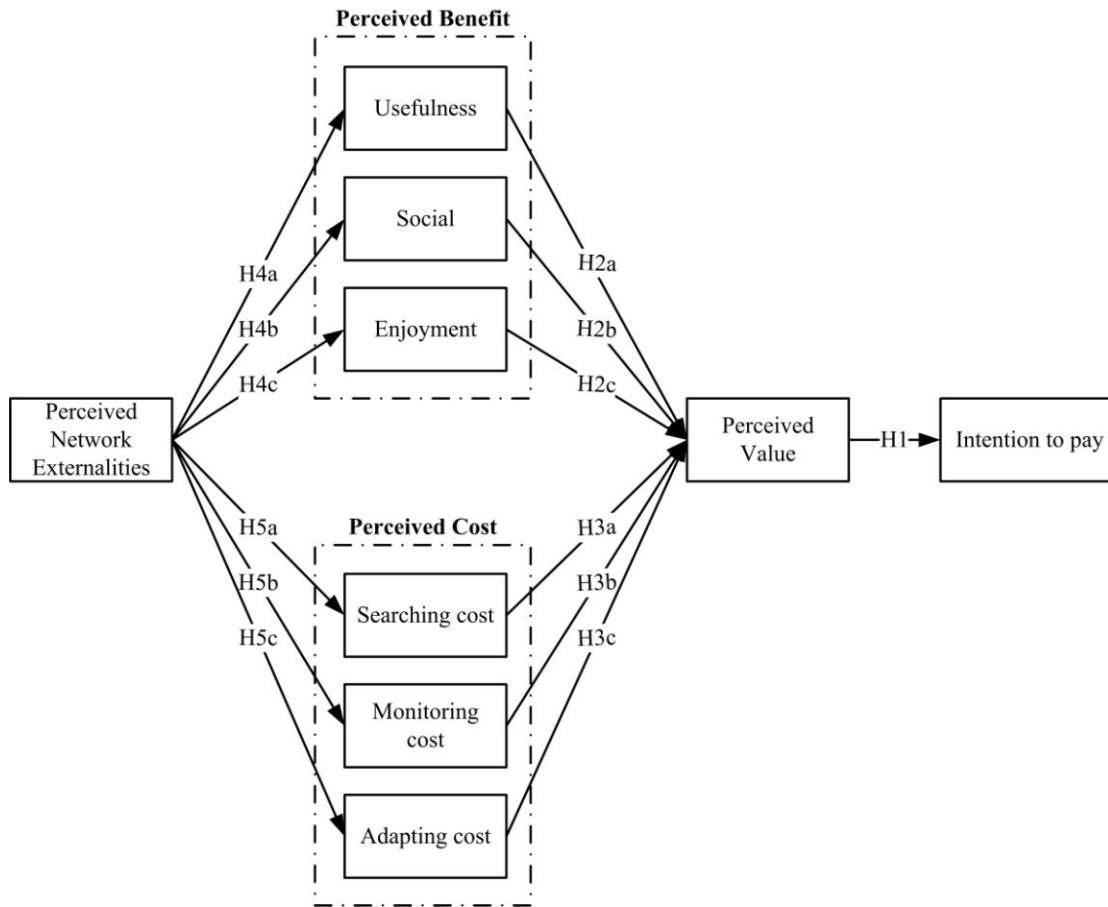


Figure 1: The Model of Seller Intention to Pay for Online Auction

2.2. Perceived Benefits

Perceived benefit comprises the effects obtained from the product or service according to user assessment [Lee 2009; Monroe & Krishnan 1985]. Kim et al. [2007] proposed that the benefits of usefulness and enjoyment affect a person's perceived value in IT. Davis et al. [1992] discovered that both extrinsic (usefulness) and intrinsic (enjoyment) factors affect the motivation to use IT systems. Many researchers [Chu & Lu 2007; Lin & Bhattacharjee 2008; Lu & Su 2009; Moon & Kim 2001; Park et al. 2011; van der Heijden 2004] have agreed that current IT systems possess a hedonic (enjoyment) characteristic as well as a utilitarian (usefulness) characteristic. Hence, to the seller, auction websites are an IT system that offers both utilitarian and hedonic benefits [Elms et al. 2005].

Lamb and Kling [2003] believed that using information and communication technology (ICT) should entail considering social aspect factors. Thus, this study assumes that virtual community exploration, such as that on auction websites, should also involve considering social aspect factors. Wang and Chiang [2009] deemed auction websites as transaction-oriented information systems, through which sellers establish reputations and maintain relationships with buyers to enhance social relationships with customers and to promote benefits (e.g., buyer's repeated purchase). To summarize, this study investigated sellers' perceived benefits as derived from intrinsic and extrinsic motives and social aspect factors. We thus propose usefulness, enjoyment, and social benefit as components of sellers' perceived benefits regarding auction websites.

2.2.1 Extrinsic Benefit: Usefulness

Davis et al. [1992] defined perceived usefulness as the extent to which a person believes that using a particular system enhances his/her job performance. Several researchers [Chu & Lu 2007; Kim et al. 2007] believe that usefulness is one of the crucial factors affecting perceived value; if the user perceives usefulness while using IT, his/her perceived value toward such IT would increase significantly. Hence, in the auction website context, a seller's

perception that the website can help him/her effectively sell the commodity promotes his/her perception of usefulness in auction websites and further increases perceived value. Thus, we hypothesize that:

H2a: Usefulness positively affects a seller's perceived value toward an on auction website

2.2.2 Social Benefit

Social benefit produces familiarity, friendship, and personal identification. The sense of familiarity the service provider creates when serving its customers generates interaction with the customer [McCallum & Harrison 1985]. For instance, on an auction website, the seller provides comprehensive answers to a customer's questions, allowing the customer to identify personally with the seller with the potential for a possible friendship [Elms et al. 2005]. Auction websites are transaction-oriented information systems; therefore, maintaining good inter-personal relationships with buyers is crucial for sellers. A seller can create social relationships with buyers by asking a question, through discussion forums, and feedback [Prince 2004]. In this view, seller's social networking with buyers helps gain benefits on online auction websites and further increases the perceived value. Therefore, we hypothesize that:

H2b: Social benefit positively affects a seller's perceived value on the auction website.

2.2.3 Intrinsic Benefit: Enjoyment

Moon and Kim [2001] defined enjoyment as the subjective pleasure a person feels when performing certain behaviors or a certain activity. Many researchers have suggested that when a user experiences more enjoyment using an IT system, he/she has increasingly intense motives to interact with IT [Kim et al. 2007; Lu & Su, 2009; van der Heijden, 2004]. Elms et al. [2005] indicated that sellers find enjoyment using auction websites because they provide sales tools that enable sellers to plan and design the sales information independently as well as for sales of items to increase, thereby generating pleasant feelings for sellers [Elms et al. 2005; Prince 2004]. Other researchers have also suggested that enjoyment is a factor affecting perceived value, and that if the user's emotion of pleasure is aroused during his/her interaction with IT, it helps increase his/her perceived value [Chu & Lu 2007; Kim et al. 2007; Lin & Hung 2009]. Thus, we believe that when the seller thinks he/she feels pleased with the auction website, a sense of value for such an auction website arises in him/her." Thus, we present the following hypothesis:

H2c: Enjoyment positively affects a seller's perceived value of the auction website.

2.3. Perceived Costs

Perceived cost, which is what the consumer should sacrifice during a transaction, affects his/her assessment of perceived value [Bolton & Drew 1991; Kuo et al. 2009]. In the auction website context, too many competitors with the same or similar products within the platform, or other problems such as a deadbeat bidder, force the seller to spend more time and effort covering the needed transaction cost [Elms et al. 2005; Prince 2004]. The cost involved in transaction-related activities is called "transaction cost". Hence, this study uses transaction cost to represent the cost the seller should pay to complete the transaction via the auction website.

2.3.1 Transaction Cost

Coase [1937] suggested that each transaction involves expenditures and cost, which includes not only an evaluation of the cost of market transactions but also the time and effort devoted to completing transactions. Liang and Huang [1998] believed that seven types of transaction costs might occur during a transaction in the electronic market: searching, comparison, examination, ordering, payment, delivery, and post-service costs. Teo and Yu [2005] explored the transaction process for consumers purchasing commodities online, which encompassed searching as an ex-ante transaction cost and monitoring and adapting as ex-post transaction costs. For sellers in the context of an auction website, transaction costs are not simply the expenses paid for the transaction and they further include implicit costs such as time and effort. For example, in the course of a transaction, sellers should spend time and expend effort such as keeping close track of how competitors operate, searching for information on opponents' products, contacting buyers and arranging payment and delivery, and managing problems such as returns [Elms et al. 2005; Prince 2004; Sinclair 2007]. Hence, based on these views, this study infers that the transaction costs incurred when the seller sells on the auction website are searching, monitoring, and adapting costs.

Searching cost refers to the time and effort the seller spends on searching for competitor information (e.g., content of marketing and product information) to learn how they operate, their strategy for ensuring that customers return, and the stock position of products [Elms et al. 2005]. Monitoring cost refers to the time and effort the seller expends on monitoring buyers' performance of a transaction. For example, the seller should expend time and effort to make contact with or follow up buyers' conditions if they fail to obtain payment within the allocated time after bidding. Adapting cost means the time and efforts the seller expends on managing orders. For example, if the buyer is not happy with the item after receiving it and demands replacement or return, then the seller should expend time and effort to provide such an after service.

Previous studies have shown that having to pay for the process of a transaction negatively affects how a user feels on the value of a product or service [Chu & Lu 2007; Kim et al. 2007; Kuo et al. 2009]. Thus, we believe that

the transaction cost that the seller should pay on the auction website (e.g., searching, monitoring, and adapting costs) negatively affects his/her perceived value on the auction website. Therefore, we hypothesize the following:

H3a: Searching cost negatively affects a seller's perceived value on the auction website.

H3b: Monitoring cost negatively affects a seller's perceived value on the auction website.

H3c: Adapting cost negatively affects a seller's perceived value on the auction website.

2.4. Perceived Network Externalities

Katz and Shapiro [1985] defined network externalities as the value or effects the user gains from a product or service creating more value with an increased number of users. When users reach a critical mass, the benefit of externalities emerges to attract new users to join [Lin & Bhattacharjee 2008]. Because an auction website is a transaction-based information system, its diverse commodity and the scale of its members are both key factors affecting its success [Gupta & Mela, 2008]. From the view of network externalities, the auction website that owns more commodity variety can attract more buyers to bid, and the sellers, in turn, have more intent to place their items on it because the number of buyers increases. Hence, diverse commodity and the scale of members are both factors propelling "perceived network externalities".

Perceived network externalities can be positive or negative [Hellofs & Jacobsen 1999; Lin and Bhattacharjee 2008]. Externalities are positive when externality benefit becomes stronger with more users within the same network community [Lin & Bhattacharjee 2008]. The externality benefit for sellers increases with more buyers contending on the auction website [Gupta & Mela 2008], which increases the likelihood of sellers' gains and affects the usefulness perceived by sellers using auction websites. The auction website provides the opportunity for both sellers and buyers to communicate and socialize, as well as to gain market information [Wang & Chiang 2009]. Therefore, an auction website with a larger client base offers more opportunities for sellers to interact with potential customers or buyers, thereby creating connections to develop a social network for both parties. An online auction market with massive buyers helps increase sellers' sales and buyers' bidding and purchases, thus being pleasing to sellers [Prince 2004; Sinclair 2007]. Consequently, we hypothesize that:

H4a: Perceived network externalities will have a positive effect on a seller's usefulness.

H4b: Perceived network externalities will have a positive effect on a seller's social benefit.

H4c: Perceived network externalities will have a positive effect on a seller's enjoyment.

However, perceived negative externalities also affect the online auction environment [Gupta & Mela 2008]. For instance, the seller attempts to remain updated with information about competitors, as the number of other sellers offering the same or similar commodities increases. Hence, the seller must perform additional searches to observe competitor operations to keep in step [Elms et al. 2005; Prince 2004]. In the case of too many buyers who delay payment or fail to perform transactions after bidding, the seller must spend more time and effort making contact with such buyers, which translates to additional monitoring cost for the seller. Furthermore, order delivery is the most vital service the seller provides to customers [Sinclair 2007]. To provide higher-quality service than that offered by competitors, the seller must cope with unexpected problems with buyers (e.g., replacement and returns) or changes in orders. Accordingly, we hypothesize that:

H5a: Perceived network externalities will have a negative effect on a seller's searching cost.

H5b: Perceived network externalities will have a negative effect on a seller's monitoring cost.

H5c: Perceived network externalities will have a negative effect on a seller's adapting cost.

3. Method

3.1. Measurement Instruments

The questionnaire included items adapted from previous literature. Appendix A lists the survey items. Scale items for intention to pay were adapted from Dodds et al. [1991]. The scale items for perceived value were adapted from Sirdeshmukh et al. [2002]. Items for usefulness and enjoyment were adapted from Davis [1989], and Agarwal and Karahanna [2000]. The measures for transaction cost were based on Teo and Yu [2005]. Items for measuring network externality were adapted from Pae and Hyun [2002]. Finally, social benefits were measured according to statements developed specifically for this study. The scales were all modified based on field interviews and discussions with online auction sellers. All items were measured using a 5-point Likert scale, ranging from *strongly disagree (1) to strongly agree (5)*.

3.2. Data Collection

This study's research model was tested by surveying sellers on the Yahoo-Kimo online auction. Zhan [2008] indicated the following auction websites frequented by Taiwanese web users: Yahoo-Kimo (with a hit-rate at 82.2%), Ruten (16.6%), Hinet (0.2%), and others (0.7%). With a hit rate of over 80%, Yahoo-Kimo was chosen because it is the chief platform for C2C transactions and is the largest and most frequently used online auction marketplace in Taiwan [Chiu et al. 2010]. Furthermore, sellers must pay Yahoo-Kimo to sell their commodities on

its platform, in contrast to most of its competitors, who offer free access. We collected data by providing links to the online questionnaire website for this research on auction bulletin board systems (BBS). To avoid repeated responses, each respondent was required to provide his or her auction account and phone number.

This study collected 428 returned online questionnaires. After subtracting respondents who were not using the Yahoo-Kimo online auction (63), as well as questionnaires with invalid or repeated answers (29), the total number of valid questionnaires was 336, yielding a valid return rate of 78.5 %. Table 1 shows the detailed sample demographics.

Table 1: Sample Demographics

Measure	Item	Frequency	percentage
Gender	Male	143	42.6
	Female	193	57.4
Age (years)	Under 20	10	3
	21-30	161	47.9
	31-40	135	40.2
	41-50	27	8
	> 50	3	0.9
Education	High school or less	44	13.1
	Some college or Bachelor's degree	203	60.4
	Graduate degree	89	26.5
Occupation	Student	139	41.3
	Home markers	46	13.7
	Self-employed	100	29.8
	Others	51	15.2
Feedback ¹	< 999	159	47.3
	1000 – 2499	58	17.3
	2500 – 4999	63	18.7
	5000 – 9999	39	11.6
	> 10000	17	5.1
Experience of using online auctions (in years)	Under 1	89	26.5
	1-2	69	20.5
	2-3	138	41.1
	> 3	40	11.9

¹: Feedback consists of a positive, negative, or neutral rating, along with a short comment. Buyers build a specialized reputation and image that are based on all the Feedback ratings and comments left by their trading customers.

4. Results

4.1. Measurement Model

The confirmatory factor analyses (CFA) involved using AMOS 7.0 for testing the measurement model, and six common model fit measures, χ^2 / df , GFI, AGFI, NFI, CFI, and RMSEA, entailed testing for goodness of fit. Table 2 shows that all model-fit indices exceeded the recommended value derived from previous studies, thus exhibiting an adequate fit to the collected data.

Table 2: Fit Indices for the Measurement

Fit indices	Recommended value	Suggested by authors	Measurement model
χ^2 / df	≤ 3	Hayduck [1987]	1.22
Goodness of fit index (GFI)	≥ 0.9	Scott [1994]	0.93
Adjusted for degrees of freedom (AGFI)	≥ 0.8	Scott [1994]	0.91
Normed fit index (NFI)	≥ 0.9	Bentler and Bonett [1980]	0.96
Comparative fit index (CFI)	≥ 0.9	Bagozzi and Yi [1998]	0.99
Root mean square error of approximation (RMSEA)	≤ 0.08	Bagozzi and Yi [1998]	0.026

This research estimated reliability and convergent validity of the factors using composite reliability (CR) and average variance extracted (AVE) (see Table 3). The composite reliability of factors ranged from 0.81 to 0.96, exceeding the threshold of 0.7 [Nunnally 1978]. The AVE ranged from 0.59 to 0.87, which were above the acceptability value of 0.5 [Fornell & Larcker 1981]. Factor loadings of the measurement items also demonstrated convergent validity (i.e., should exceed 0.5). All indicator factor loadings were above 0.70. For satisfactory discriminant validity, the square root of the AVE for each construct exceeded the square correlation between any pair of distinct constructs [Fornell & Larcker 1981]. Table 4 shows that the AVE of every construct was greater than the square of the correlation coefficient among the constructs. The measurement model of this study exhibited good reliability, convergent validity, and discriminant validity.

Table 3: Statistics of Construct Items

Construct	Items	Factor loadings	Composite reliability (CR)	Average variance extracted (AVE)
Perceived network externalities (NE)	NE1	0.93	0.94	0.84
	NE2	0.94		
	NE3	0.87		
Usefulness (UB)	UB1	0.85	0.88	0.72
	UB2	0.91		
	UB3	0.77		
Social benefit (SB)	SB1	0.85	0.89	0.72
	SB2	0.87		
	SB3	0.83		
Enjoyment (EB)	EB1	0.91	0.93	0.81
	EB2	0.92		
	EB3	0.87		
Searching cost (SC)	SC1	0.93	0.95	0.87
	SC2	0.93		
	SC3	0.94		
Monitoring cost (MC)	MC1	0.70	0.81	0.59
	MC2	0.82		
	MC3	0.78		
Adapting cost (AC)	AC1	0.91	0.89	0.74
	AC2	0.87		
	AC3	0.79		
Perceived value (PV)	PV1	0.89	0.96	0.87
	PV2	0.95		
	PV3	0.95		
	PV4	0.93		
Intention to pay (ITP)	ITP1	0.89	0.83	0.72
	ITP2	0.80		

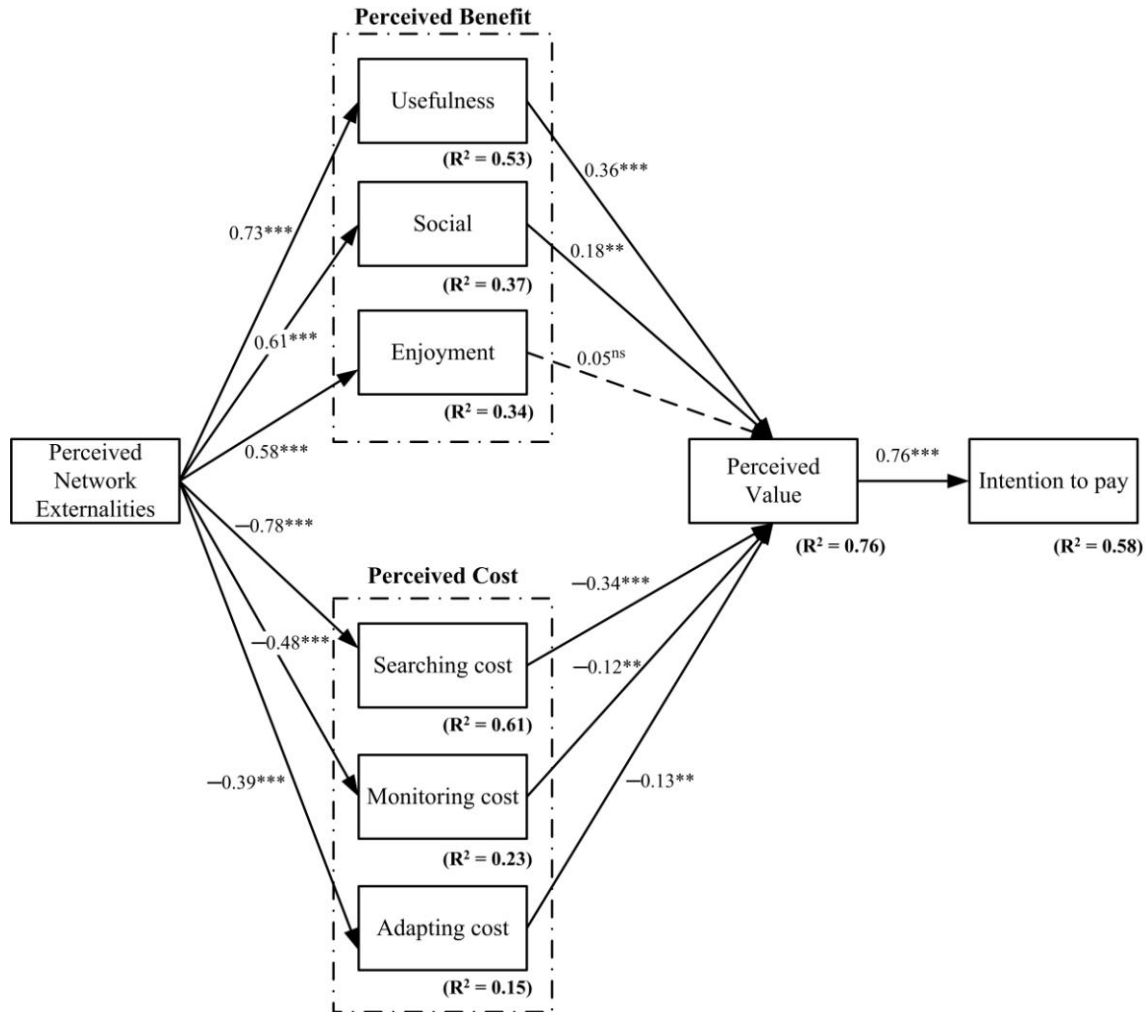
Table 4: Discriminant Validity and Correlation of Constructs²

Construct	NE	UB	SB	EB	SC	MC	AC	PV	ITP
NE	0.92								
UB	0.64	0.85							
SB	0.51	0.58	0.85						
EB	0.51	0.48	0.53	0.90					
SC	-0.72	-0.59	-0.53	-0.55	0.93				
MC	-0.40	-0.35	-0.27	-0.26	0.36	0.77			
AC	-0.33	-0.36	-0.25	-0.26	0.26	0.36	0.86		
PV	0.71	0.73	0.61	0.54	-0.72	-0.45	-0.42	0.93	
ITP	0.57	0.59	0.54	0.57	-0.63	-0.46	-0.28	0.69	0.85

²: Diagonal elements (bold) are the average variance extracted (AVE). Off-diagonal elements are correlations between constructs.

4.2. Tests of the Structural Model

Structural model testing used AMOS 7.0. Model-fit indices for the structural model provided evidence of a good model fit ($\chi^2 / df = 1.80$, GFI = 0.89, AGFI = 0.86, NFI = 0.94, CFI = 0.97, and RMSEA = 0.049). Figure 2 displays the standardized path coefficients (β), path significances, and variance explained (R^2) according to each path. Most of the hypotheses (H1, 2a, 2b, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, and 5c) were significant in SEM prediction, except for enjoyment (H2c). Perceived value had a significant impact on intention to pay (H1). Findings showed five factors to relate significantly to perceived value: usefulness (H2a), social benefits (H2b), searching cost (H3a), monitoring cost (H3b), and adapting cost (H3c). Perceived network externalities (H4a, 4b, 4c, 5a, 5b, and 5c) were significantly related to usefulness, social benefits, enjoyment, searching cost, monitoring cost, and adapting cost. Consequently, the research model explained 58 percent of the variance in intention to pay.



***P < 0.001, **P < 0.01, *P < 0.05, ns = not significant.

Figure 2: Path Analysis Results of Based on All Valid Samples (n = 336)

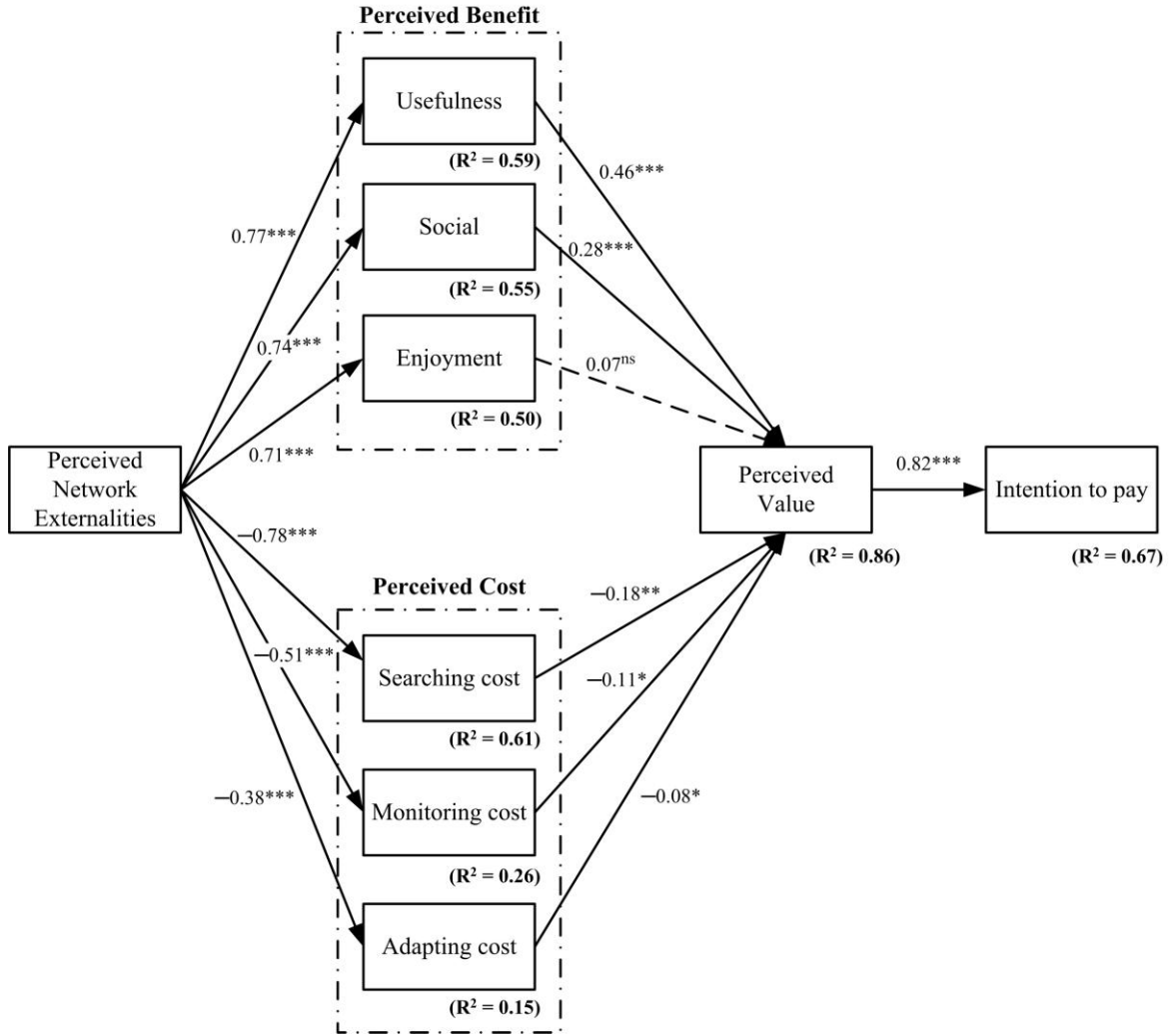
4.3. Comparison Between Expert and Non-Expert Sellers

Auction sellers comprise two types: the first is the expert seller, who uses online auction services frequently; and the second is the non-expert seller, who uses the services sporadically for individual transactions [Halstead & Becherer 2003]. As an auction website grows, the number of its expert sellers also increases [Zhan 2008]. These expert sellers use auction websites as their distribution platform to manage their personal brands. The C2C platform is now no longer merely a marketplace for second-hand transactions by non-expert sellers, but one of the major distribution networks for online marketing.

On the auction website, positive feedback means the ability of a business to appeal to online shoppers [Prince 2004]. Positive feedback is important to sellers, because it helps them build a specialized reputation and image, and, has actual influence on customers [Prince 2004; Sinclair 2007]. Zhan [2008] believed that expert seller in the online auction feature thousands, or tens of thousands, of instances of feedback. Thus, this study divided sellers into expert (with more than 1,000 instances of feedback) and non-expert (less than 999 instances of feedback), of whom 177 have received up to 1,000 instances of feedback, and more than 159 have received less than 999 instances of feedback.

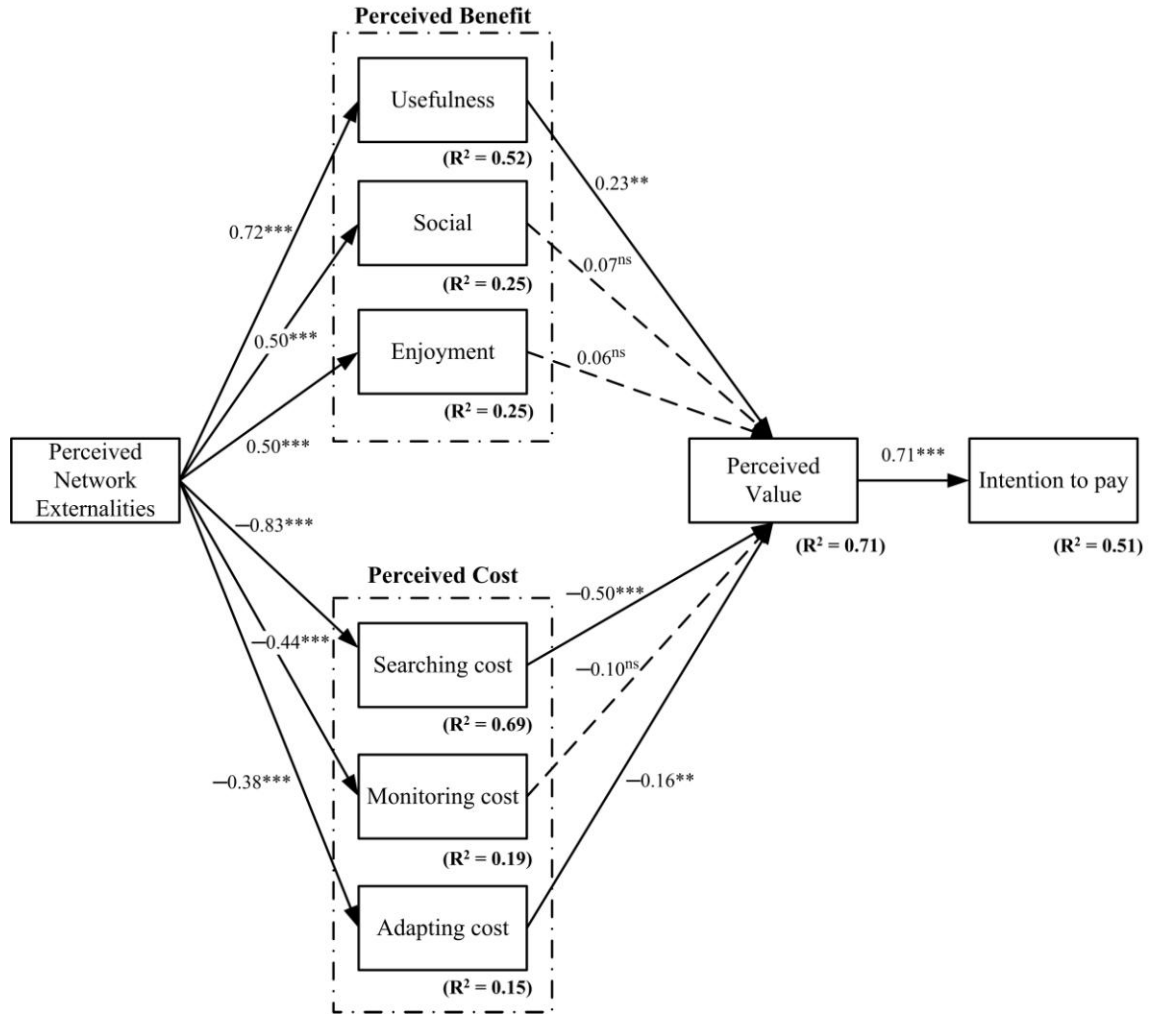
This study used the AMOS 7.0 multiple-group analysis to analyze these two groups of sellers. The goodness of fit of this model is $\chi^2 / df = 1.50$, GFI = 0.83, AGFI = 0.80, NFI = 0.90, CFI = 0.96, and RMSEA = 0.039. Each of these indices is consistent with the values suggested by other researchers, indicating a fit of the data and research model used in this study. Figures 3 (expert sellers) and 4 (non-expert sellers) show the estimation results of the standardized path coefficient (β) and variance explained (R^2) for the relationships between the constructs. The research results show apparent differences between the path “social benefit \rightarrow perceived value” and the path “monitoring cost \rightarrow perceived value.”

The current investigation also compared critical ratios for differences between parameters [Arbuckle 2006] using parameter pairing to examine the differences in standard coefficients for the model between expert sellers and non-expert sellers, as Table 5 shows. Perceived value had a more salient effect on intention to pay for expert sellers than for non-expert sellers. Regarding perceived benefit, the effects of usefulness and sociability were both greater for expert sellers than for non-expert sellers. However, the effect of enjoyment on perceived value apparently did not differ between the two groups. Regarding perceived cost, only the effect of searching cost on perceived value was greater for non-expert sellers than for expert sellers; otherwise, there was no significant difference in either the effect of monitoring cost or that of adapting cost on perceived value between the two groups. Regarding network externalities, their effects on perceived benefits (usefulness, social, and enjoyment) were all greater for expert sellers than for non-expert sellers. Moreover, the effects of perceived network externalities on perceived costs (searching cost and monitoring cost) were all greater for expert sellers than for non-expert sellers, except for that on adapting cost, which displayed no apparent difference between the two groups.



***P < 0.001, **P < 0.01, *P < 0.05, ns = not significant.

Figure 3: Path Analysis Results for Expert Sellers (n = 117)



***P < 0.001, **P < 0.01, *P < 0.05, ns = not significant.

Figure 4: Path Analysis Results for Non-Expert Sellers (n = 159)

Table 5: Comparison of Corresponding Path Coefficients for Expert and Non-Expert Sellers³

Hypothesis	B _E	SE _E	B _{NE}	SE _{NE}	Difference	
					t-value	Result
H1: PV → ITP	0.72	0.058	0.53	0.053	2.47*	E>NE
H2a: UB → PV	0.50	0.060	0.25	0.044	2.26*	E>NE
H2b: SB → PV	0.24	0.075	0.08	0.048	1.98*	E>NE
H2c: EB → PV	0.05	0.080	0.04	0.066	0.17	ns
H3a: SC → PV	-0.12	0.089	-0.34	0.054	3.54***	NE>E
H3b: MC → PV	-0.17	0.051	-0.18	0.032	0.07	ns
H3c: AC → PV	-0.11	0.050	-0.20	0.041	0.09	ns
H4a: NE → UB	0.63	0.073	0.41	0.079	2.96**	E>NE
H4b: NE → SB	0.75	0.054	0.29	0.066	5.14***	E>NE
H4c: NE → EB	0.78	0.045	0.43	0.040	3.33***	E>NE
H5a: NE → SC	-1.04	0.039	-0.73	0.051	-2.91**	E>NE
H5b: NE → MC	-0.29	0.070	-0.14	0.114	-2.51*	E>NE
H5c: NE → AC	-0.24	0.056	-0.19	0.073	-0.83	ns

³: E: expert sellers; NE: non-expert sellers; B: unstandardized estimates; SE: standard error of regression weight.

5. Summary and Discussion

This study used sellers at priced auction websites as subjects and investigated the factors that affect their use of such websites in selling commodities. The results reveal that online auction companies must build customer value or network externalities to be successful. These findings are consistent with Gupta and Mela [2008], as discussed below. First, the current study's results show that when sellers' perceived value of online auction is high, their intention to pay is also high. This finding supports the belief of many scholars [Chu & Lu 2007; Sweeney et al. 1997], in that the perceived benefits of products purchased by consumers outweigh the perceived costs and positively relate with intention to pay.

Regarding sellers' perceptions of benefits, the usefulness of an online auction is more essential than its social benefits. However, the effect of enjoyment on perceived value is not significant, indicating that utilitarian benefits created by an IT system are what transaction-oriented users truly value [Lee 2009]. Consonant with Gupta and Kim [2007], this study proposes that perceived costs have a negative effect on perceived value. Our finding indicates that searching cost, monitoring cost, and adapting cost all have negative effects on perceived value. This study also maintains that an online auction company's network externalities can be positive or negative [Gupta & Mela 2008]. This study's empirical results show that the seller's perceived network externalities positively relate with perceived benefits. This finding explains why more buyers bidding on a certain website add to sellers' external benefits. Among the perceived benefits, usefulness is the most essential.

However, perceived network externalities can also have a negative influence on perceived costs. Our finding suggests that perceived network externalities have negative influences on all transaction costs (that is, searching, monitoring, and adapting costs). This leads to the following beliefs: that with more sellers selling the same or similar commodities, sellers should pay a higher searching cost to track their competitors; that monitoring costs increase to contact buyers if too many buyers do not perform transactions after bidding; and that adapting costs also increase for sellers when verifying whether buyers perform their orders [Elms et al. 2005; Prince 2004]. Although perceived network externalities enhance sellers' sense of their perceived benefits, the crowding phenomenon increases sellers' awareness of perceived costs and negatively influences the online auction's perceived value and sellers' intention to pay.

By further analyzing different types of seller groups, we found apparent differences between expert and non-expert sellers (Figures 3 and 4). First, regarding the path of influence on perceived value, social benefit for expert sellers has a positive influence, whereas that for non-expert sellers does not. The finding suggests that when an expert seller believes that creating social connections with customers through an auction website is possible, his/her sense of value with such a website increases. By contrast, the non-expert seller (who may simply be selling items on the website temporarily) deems fulfilling a single transaction as paramount, thus giving less thought to establishing social connections with customers [Sinclair 2007]. Second, monitoring cost has a negative influence for expert sellers but not for non-expert sellers. This finding indicates that as the expert seller makes contact with more buyers than the non-expert seller does (when others in addition to expected buyers fail to exact payment within the given time line), the seller is forced to spend more time and effort making contact or following up. Hence, monitor management requires more time and effort of expert sellers than of non-expert sellers.

This finding also helps understand that the factors of perceived value, perceived benefit, perceived cost, and perceived network externalities differ between the different types of sellers (Table 5). Expert sellers are more susceptible than non-expert sellers to the influence of the perceived value of intent to pay, whereas their perception of usefulness and social features are all more intense than those of non-expert sellers. However, non-expert sellers have stronger perceptions of searching cost. Finally, aside from the influence of perceived network externalities on adapting cost, which displays little difference between the two groups, expert sellers perceive more intensely of network externalities on perceived benefit and perceived cost than non-expert sellers do. It is thus known that on transaction-based auction websites, the factors affecting the sellers' payment for using the website differ according to the type of seller.

According to the 80/20 rule, 80% of the corporate performance is from 20% of its products [Anderson 2006]. Similarly, on auction websites, 20% of the customers (sellers) contribute to 80% of its performance. The chances that an existing seller sells commodities on the Internet are four or five times greater than those of the new customer group (sellers) [Elms et al. 2005]. Hence, auction website services should provide personalized payment and service modes for different types of seller demands by knowing the seller attributes, to draw the sellers to continue using the website to sell their commodity.

6. Implications

6.1. Implications for Academic Researchers

This study provides a research model for academic researchers to examine the seller's, instead of the buyer's, intention to pay for e-commerce services. The seller's perspective is valuable because most e-commerce services are free to consumers. Knowing why sellers are willing to pay for e-commerce services has the potential to provide a major revenue source for many e-commerce sites. This study's results show that the research model carries good variance of explained value and is useful to predict sellers' intention to pay for auction website services.

Our research indicates that usefulness, social benefits, searching cost, monitoring cost, and adapting cost have direct effects on perceived value. Findings show that the seller's perceived network externalities have strong effects on both perceived benefit and perceived cost. Hence, a transaction-oriented context should consider these six factors (network externalities, usefulness, social benefit, searching cost, monitoring cost, and adapting cost). Future researchers can extend these theoretical concepts as study topics.

6.2. Implications for Online Auction Practitioners

For online auction practitioners, the results of this study show that network externalities, perceived benefits, perceived costs, and perceived value play vital roles in affecting sellers' intention to pay for services. Therefore, online auction practitioners should focus on how to enhance sellers' perceived benefits (usefulness and social benefit) through network externalities, by lowering perceived costs (searching, monitoring, and adapting costs), and by simultaneously developing perceived value to further boost sellers' intention to pay for online services. These findings have two crucial implications for managers.

First, online auction managers should enhance network externalities of their online auction platforms. Auction websites are C2C transaction platforms featuring spontaneous transactions and negotiations between sellers and buyers. As the number of users and commodities on the platform increases, increasingly more people naturally begin to visit the platform. Because the concept of free marketing is often used in the cyber world, web service providers rapidly increase the number of people using their sites to a critical mass by offering products or basic services free of charge (Gupta & Mela, 2008). For instance, when Skype first introduced telephone use over the Internet, it attracted additional users by offering free use, thereby increasing its strength of externalities. Therefore, auction website service providers should publicly offer free services (e.g., insertion fees and final value fees) to sellers at early stages to attract more buyers to bid and, when the scale and number of users are mature, begin exercising the charging system on sellers to obtain user payment. In addition, service providers should constantly improve services and apply innovative strategies (e.g., launching activities and ads with a theme) to ensure that members continue using the websites, thereby sustaining the network effect of the website and generating more profit.

Second, online auction practitioners must increase sellers' value perceptions of conducting e-commerce on their websites. The benefits perceived by sellers positively relate with their perceptions of value, and only when sellers' perceived value of an online auction platform is high, are they more willing to pay. Online auction companies design their marketing activities based on the types of commodities auctioned. However, a thorough understanding of perceived benefits and perceived costs for expert and non-expert sellers can help online companies develop new strategies and provide higher-quality services and transaction platforms to attract and keep more sellers. They can also enhance their advertisement expenditures for different types of sellers, establish more effective management tools (such as a commodities manager or automatic preference setting system), and stipulate stricter rules (that disqualify bad buyers, for example) to help sellers quickly verify buyers and enhance their shipment efficiency. Meanwhile, online companies should improve their search engines so that buyers can search for products easily and enjoy a more pleasant shopping experience.

7. Limitations and Future Research

Despite its valuable findings and implications, this study has a number of limitations. First, the implications were based on a single study using samples from Taiwan. Therefore, caution should be adopted when generalizing the findings to other e-commerce situations. Further research conducted in cross-cultural and cross-marketplace contexts can investigate and compare differences in the antecedents of intention to pay.

Second, we investigated factors that influence the willingness of users (sellers) to pay fees using online auctions as our research background. However, the scope of e-commerce is extremely wide, and verifying the integrated model proposed in this study by investigating the behavioral intentions of users from other contexts, such as group buying (for example, Groupon), online shopping, and social media, is recommended for future studies.

Third, by conducting our investigations from the perspective of sellers, we identified that the factors that influence sellers' to pay to use a website differ depending on the seller category (expert and non-expert sellers). Investigating the influence of network externalities and perceived value on various product categories is recommended for subsequent studies.

Fourth, for this study, we collected data using an online questionnaire, which inevitably generates errors because of the self-selected respondents. Online auction communities complete transactions through anonymous accounts. However, the transactions can be easily completed and canceled, and information regarding respondents' social background is insufficient. These limitations of the e-commerce context increase the difficulty of using standard sampling and statistical methods. Validating the model and hypotheses using an expanded sample size or multiple sampling in future studies can solve these problems. Additionally, we use sellers of a specific auction website (Yahoo-Kimo) as our research subjects. We recommend that future studies sample and analyze sellers of other auction websites or those with a propensity to use online methods to better understand the willingness of sellers on auction websites to pay fees.

Finally, we suggest that researchers investigate related moderating variables (such as people's personalities and sex) to better understand the use of transaction-oriented information systems. In conclusion, the results of this study not only provide further understanding of sellers' intentions to pay for online auction services but also offer an impetus for future studies.

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Appendix A. The Questionnaire

Perceived Network externalities (NE)

NE1: Most people use the Yahoo-Kimo auction website.

NE2: The number of people using the Yahoo-Kimo auction website will increase the utility of selling my items.

NE3: Many people will use the Yahoo-Kimo auction website in the future.

Usefulness (UB)

UB1: Since using the Yahoo-Kimo auction website, I am more efficient in selling items.

UB2: Using the Yahoo-Kimo auction website makes it easier for me to sell items.

UB3: I think the Yahoo-Kimo auction website helps me sell my selling items.

Social benefit (SB)

SB1: Through the Yahoo-Kimo auction website, I can maintain good interaction with buyers.

SB2: Through the Yahoo-Kimo auction website, I maintain friendly relations with buyers.

SB3: Through the Yahoo-Kimo auction website, I can communicate with buyers.

Enjoyment (EB)

EB1: Using the Yahoo-Kimo auction website gives me a lot of enjoyment.

EB2: I think the Yahoo-Kimo auction website is fun and interesting.

EB3: I enjoy using the Yahoo-Kimo auction website.

Searching cost (SC)

SC1: I spend a lot of time looking for competitor information on the Yahoo-Kimo auction website.

SC2: I put a lot of effort looking for competitor information on the Yahoo-Kimo auction website.

SC3: Generally, I need to search for competitor information on the Yahoo-Kimo auction website.

Monitoring cost (MC)

MC1: I spend a lot of time trying to contact buyers on the Yahoo-Kimo auction website.

MC2: I put a lot of effort contacting buyers on the Yahoo-Kimo auction website.

MC3: Generally, I need to monitor buyers on the Yahoo-Kimo auction website at all times to see whether they have settled their orders.

Adapting cost (AC)

AC1: I spend a lot of time dealing with problems of buyers at the Yahoo-Kimo auction website (e.g., returns and replacement).

AC2: I put a lot of effort into dealing with problems of buyers at the Yahoo-Kimo auction website (e.g., returns and replacement).

AC3: Generally, I need to deal with problems of buyers at the Yahoo-Kimo auction website (e.g., returns and replacement) at any time.

Perceived value (PV)

PV1: For the fee I pay, using the Yahoo-Kimo auction website offers good value for the money.

PV2: For the amount of effort I put in, using the Yahoo-Kimo auction website is beneficial to me.

PV3: For the time I need to spend, using the Yahoo-Kimo auction website is worthwhile to me.

PV4: Overall, using the Yahoo-Kimo auction website provides me with good value.

Intention to pay (ITP)

ITP1: I intend to pay for using the Yahoo-Kimo auction website.

ITP2: I intend to continue paying to use the Yahoo-Kimo auction website in the future.