

Sun: Transferring Attributes of E-Commerce Systems into Business Benefits

TRANSFERRING ATTRIBUTES OF E-COMMERCE SYSTEMS INTO BUSINESS BENEFITS: A RELATIONSHIP QUALITY PERSPECTIVE

Heshan Sun

School of Information Resources and Library Science

University of Arizona

1515 East First Street

Tucson, AZ 85737, USA

hsun@email.arizona.edu

ABSTRACT

This paper investigates how the quality of certain attributes of e-commerce systems — such as information quality, system quality, and service quality — can be leveraged to enhance business benefits as indicated by customer commitment and customer retention. This study argues that relationship quality, a concept encapsulating the ideas of both trust and satisfaction, is crucial for transferring attributes of e-commerce systems into business benefits. A research model of relationship quality in e-commerce was built, drawing upon information systems and marketing literature. This model was then examined using a survey of 140 online auction sellers at uBid.com. The empirical results confirmed the research model. Information quality, system quality, and service quality affect relationship quality significantly. Relationship quality in turn has significant impact on customer commitment and customer retention.

Keywords: information quality, system quality, service quality, relationship quality, online auction, sellers

1. Introduction

This research investigates how the quality of certain attributes of e-commerce systems — including information quality, system quality and service quality— can create tangible business benefits. The empirical results of this study suggest that IT practitioners should work with their colleagues in the marketing department to leverage IT attributes of their e-commerce systems in order to reap desired business benefits.

Rapid advances in information technology have “dramatically changed how services are conceived and delivered” [Massey et al. 2007 p.278]. Web-based information technology has enabled online services, while traditional business-customer interactions are now mediated by e-commerce systems maintained by service providers rather than salespeople [Evanschitzky et al. 2004; Meuter et al. 2000]. An e-commerce system is typically a web-based information system that provides online transaction services for both buyers and sellers. An e-commerce service provider (often called the intermediary) is a third-party institution that uses e-commerce systems to facilitate transactions between buyers and sellers in its online marketplace by collecting, processing, and disseminating information [Pavlou and Gefen 2004; Sarkar et al. 1995]. Examples of e-commerce service providers include eBay.com, Amazon.com, and uBid.com.

According to DeLone and McLean [2004], there are three types of attributes in e-commerce systems: the web content of e-commerce websites, the technical aspect of the e-commerce system, and the services delivered through the e-commerce system. The quality of these attributes — hereafter labeled as information quality, system quality and service quality respectively — may impact business benefits rooted in customer commitment and customer retention. Clearly, e-commerce service providers should leverage the attributes of their e-commerce systems to help retain their customers and to maximize business benefits.

Despite its importance to e-commerce practitioners, the mechanism through which the attributes of e-commerce systems affect business benefit factors such as customer commitment and customer retention remains unclear. DeLone and McLean [2004] argued that information quality, system quality, and service quality can influence business benefits indirectly through two factors: intention to use/actual use of e-commerce systems and user satisfaction. However, not all researchers share this viewpoint. For instance, Molla and Licker [2001] proposed an e-commerce model that, unlike DeLone and McLean’s model, includes trust, which is an important factor for e-commerce success. More recently, Cyr [2008] also studied how attributes of the e-commerce system can influence customer loyalty through trust and satisfaction.

This study offers an alternative view of the mechanism through which the attributes of e-commerce systems can impact business benefits (Figure 1). Specifically, business benefits are indicated by two factors: customer commitment and customer retention. The quality of the relationship between customers and the e-commerce service provider is one — albeit probably not the only one — key factor that connects attributes of the e-commerce system and business benefit factors.

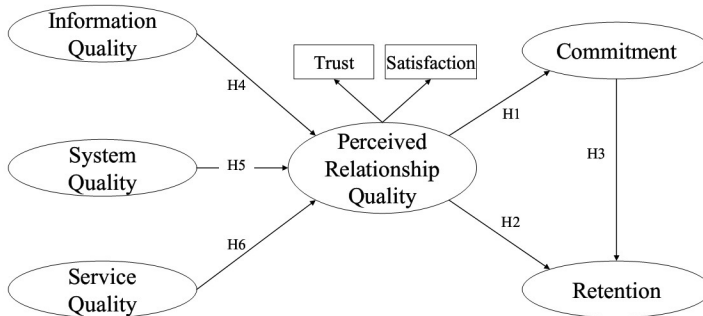


Figure 1: Research Model

The values of this paper lie in the synthesis of the prior research on trust and satisfaction from a relationship quality perspective. Several IS researchers have studied how attributes of e-commerce systems influence trust [e.g., Cyr 2008; Flavian et al. 2006; Wang and Emurian 2005] and satisfaction [e.g., DeWulf et al. 2006; Molla and Licker 2001; Szymanski and Hise 2000]. Relationship quality allows us to synthesize the prior research on these two important concepts in a parsimonious way. This synthesis has the following advantages. First, it enriches our understanding of trust and satisfaction. From prior relationship quality research, we know that trust and satisfaction are both rooted in customer relationships. Prior research on the impact of the attributes of e-commerce systems on trust and satisfaction respectively can be knitted together to give insight into how the design of e-commerce systems influences the customer relationship. The synthesis can further specify how relationship quality is reflected at different magnitudes by trust and satisfaction. Second, the synthesis of trust and satisfaction in relationship quality helps us to connect the attributes of e-commerce systems to business benefit factors more explicitly and effectively, given that that relationship quality has been closely tied with business benefit factors in marketing literature [e.g., Crosby et al. 1990; Dorsch et al. 1998; Dwyer et al. 1987; Hennig-Thurau and Klee 1997; Kumar et al. 1995; Lages et al. 2005; Leuthesser 1997; Palmatier et al. 2006]. The relationship quality literature suggests that neither trust nor satisfaction alone can fully explain how the attributes of e-commerce systems influence business benefits; taken together, however, they appear to be able to do so. This gives new opportunities for IS research to understand the impact of system attributes, which is a promising new direction for IS research [Benbasat and Barki 2007]. In fact, DeLone and McLean [2004] argued explicitly that in order to study the “net benefits” of e-commerce, one should refer to marketing research literature in addition to IS literature. This research demonstrates the usefulness of this approach and provides a convenient vehicle for doing so through studying relationship quality.

This research focuses on one type of e-commerce systems: online auction, and one type of customers: sellers. Both sellers and buyers are considered customers of online auction systems (e.g., eBay.com or uBid.com) and both are critical for the success of online auctions. Yet the existing e-commerce literature focuses exclusively on buyers, without taking the sellers into consideration. In light of the fact that more and more individuals sell things online¹, studies from their perspective beg attention.

The structure of this paper proceeds as follows. First, the concept of relationship quality from the marketing literature is introduced, leading to hypotheses about its relationships with attributes of e-commerce systems and business benefits factors. Second, the research methods are presented, followed by data analyses and results. Thereafter, the findings, limitations, contributions, and implications of this research are discussed.

¹ According to PEW Internet & American Life Project, 17% of American Internet users – about 25 million people – have sold something online in 2005. http://207.21.232.103/pdfs/PIP_SellingOnline_Nov05.pdf

2. Theoretical Development

2.1. Relationship Quality

Relationship marketing is an emerging paradigm and has attracted a lot of attention [Crosby et al. 1990; Kumar et al. 1995; Lages et al. 2005; Palmatier et al. 2006]. Within this paradigm, relationship quality is an important concept. Relationship quality, as suggested by its name, refers to the overall assessment of the strength of a relationship between two parties [Crosby et al. 1990; Palmatier et al. 2006]. A high relationship quality indicates that the customer trusts the service provider and has confidence in the service provider's future performance because the provider's past performance has been consistently satisfactory. High quality relationships are especially important for situations where customers face intangibility, uncertainties, lack of familiarity, and a long time horizon of delivery [Crosby et al. 1990], as is often the case with online selling. This study is interested in the relationship between an online auction service provider (hereafter the service provider) and its sellers. In the context of e-commerce, uncertainty, lack of familiarity, and long time horizon of delivery are very common. Thus the quality of the relationship with their sellers is critical for the success of online auction service providers.

Both the service provider and the sellers can benefit from a high quality relationship. For the service provider, maintaining a high quality relationship with its sellers is cost-saving and can provide a reliable source of future revenues and profits [Hogan et al. 2002; Lemon et al. 2001; Rust et al. 2004]. For sellers, a high quality relationship with the service provider is also beneficial in that it helps sellers make long-term commitments which reduces the uncertainty of future interaction and benefit [Crosby et al. 1990]. Therefore, both the service provider and its sellers are motivated to maintain a high quality relationship with each other. It is noteworthy that sellers and the service provider may have different perceptions of their relationship. While the service provider may perceive a high quality relationship with its sellers, the sellers may not share the same perception, or vice versa. This study focuses on the sellers' perception of the quality of their relationship with the service provider.

Relationship quality is usually conceptualized as a composite or multidimensional construct capturing the different but related facets of a relationship [Crosby et al. 1990; Kumar et al. 1995; Lages et al. 2005; Palmatier et al. 2006]. It is conceived in this study as a higher order construct that has two distinct yet related components: trust and satisfactions. These two components have been widely referred to in relationship quality studies as definitive components of relationship quality [De Wulf et al. 2001; Dorsch et al. 1998; Dwyer et al. 1987; Hennig-Thurau and Klee 1997; Leuthesser 1997].

First, trust is an important indicator of relationship quality. Only when a person trusts the trustee will he/she be likely to perceive that there is a high quality relationship between the trustee and him/her. A relationship that lacks trust is unlikely to be perceived as of high quality. It is also important to note that trust is difficult to foster, can be shaken easily, and once shaken, is extremely difficult to rebuild [Shneiderman 2000].

This study expands the conceptualization of trust as used in literature about relationship quality by utilizing affective trust. Trust has both cognitive and affective components [Johnson-George and Swap 1982; Lewis and Weigert 1985; McAllister 1995; Rempel et al. 1985; Swan et al. 1999; Swan et al. 1988], and cognitive trust is usually referred to as a set of beliefs "dealing primarily with the integrity, benevolence, and ability of another party" [Gefen et al. 2003b, p.55]. On the other hand, trust also has an affective component, consisting of the emotional bonds between trustors and trustees [Lewis and Weigert 1985; McAllister 1995]. An overview of the relationship quality literature reveals that prior research has focused primarily on cognitive trust [e.g., Crosby et al. 1990; De Wulf et al. 2001; Kumar et al. 1995; Lages et al. 2005; Palmatier et al. 2006]. The same happens in IS research too, due to IS researchers' belief that affective trust is more or less irrelevant in business transactions [Gefen et al. 2003b; Komiak and Benbasat 2006; Mcknight et al. 1998]. Komiak and Benbasat [2006], however, empirically confirmed the importance and relevance of affective trust in the e-commerce context. Compared to cognitive trust, affective trust is probably more relevant to the context of this study. After all, customer relations are more than just cognitive reasoning; they have a strong affective component. For instance, the other component of relationship quality, satisfaction, refers to an affective state, "in contrast with more rational outcomes" [De Wulf et al. 2001 p.36]. Therefore, since people do develop affective bonding with business sectors such as e-commerce providers, to varying degrees, cognitive calculations are insufficient to capture this affective aspect of the relationship [Komiak and Benbasat 2006; Lewis and Weigert 1985]. When evaluating their relationships with the service provider, customers necessarily refer to their emotions. In addition, affective trust often implies the reciprocation of trust [Kelton et al. 2008]. The idea of reciprocation of trust fits well with this research since a relationship involves interactions between two parties. Therefore, affective trust better captures the deep meaning of the trust component of relationship quality. Consistent with Komiak and Benbasat [2006], this paper defines seller's affective trust in the intermediary (hereafter trust) as a seller's subjective feeling that relying on an e-commerce service provider for conducting business is secure and comfortable.

The second component of relationship quality is satisfaction. There has been difficulty coming up with an agreed-upon definition of satisfaction [Wang et al. 2001] so, consistent with Crosby et al.'s definition of satisfaction in the relationship quality context [1990], this study defines seller's satisfaction as a positive emotional state resulting from assessment of the service provider's relationship with sellers. Relationship satisfaction is an "affective or emotional state toward a relationship, typically evaluated cumulatively over the history of the exchange" [Palmatier et al. 2006 p.138]. It is worth noting that the definition of the satisfaction component of relationship quality is different from the satisfaction with an information system that has been defined in IS research thus far. In IS research, user satisfaction with an IS has been conceived of as an attitude-like concept referring to users' subjective evaluation of the IS [Seddon 1997; Wixom and Todd 2005]. The satisfaction component of relationship quality is, on the other hand, about users' evaluation of the relationship with the service provider. The major source of relationship satisfaction is a history of positive interaction with the service provider. The customer's best assurance of future performance is "a continuous history of personalized, error-free interaction" [Crosby et al. 1990, p.70].

2.2. Consequences of Relationship Quality

Relationship quality can have various consequences depending on what context it is studied in. For instance, in studying the relationship between IS departments and IS users within organizations, Carr [2006] proposed two consequences of a high quality relationship: identification with the IS department and voluntary participation with the IS department. Given the focus of this study on business benefits in the e-commerce context, two different consequences of relationship quality, customer commitment and customer retention, are of particular interests. These two factors are considered two organizational benefits of e-commerce in DeLone and McLean's E-Commerce Model [2004]. Marketing researchers have argued that a company's current customers provide the most reliable source of future revenues and profits [e.g., Lemon et al. 2001], therefore keeping sellers dedicated to an online marketplace — that is, to make sellers committed and subsequently willing to return to and sell on the marketplace in the future — is extremely important for the service provider that maintains this marketplace.

Defined as the enduring desire to maintain a valued relationship [Moorman et al. 1992; Palmatier et al. 2006], customer commitment is one of the most commonly studied dependent variables in relationship research [Wilson and Vlosky 1998]. Commitment has often been conceptualized as a multi-dimensional construct. For instance, Gundlach and colleagues [1995] proposed three components of commitment: an instrument component of some form of investment, an attitudinal component described as affective commitment or psychological attachment, and a temporal dimension indicating that the relationship exists over time. Thus, a committed customer has invested time and emotion into the relationship with a service provider, shows affect toward it, and is willing to maintain this relationship for a certain period of time, sometimes even at the cost of short-term benefits.

Commitment is an essential ingredient for successful long-term relationships [Dwyer et al. 1987] because committed customers are the basis for business continuity and bring future value or benefits to those they are committed to [Hardwick and Ford 1986; Lemon et al. 2001]. Committed sellers feel loyal to the service provider and are willing to put extra efforts or even sacrifice short-term benefits to maintain the relationship. They are also more tolerant of minor errors from the service provider. Maintaining this commitment to a specific marketplace is especially important in e-commerce, given the low cost of switching to a different online marketplaces.

Relationship quality is expected to exhibit a positive influence on commitment. When a seller feels secure about and satisfied with relying on the service provider, he or she is more likely to make a commitment to it. High quality relationships manifest the economic, communication and/or emotional investments that are necessary for commitment to occur [Dwyer et al. 1987]. Commitment is "... fueled by the ongoing benefits accruing to each partner. These benefits include the certainty from mutually anticipated roles and goals, the efficiency stemming from the amelioration... of bargaining, and the confidence in exchange effectiveness that comes from trust" [Dwyer et al. 1987, p.19]. To start and continue his/her businesses on an online auction marketplace, a seller often spends considerable time familiarizing him/herself with the service provider, its auction procedure, and the community of buyers associated with this particular service provider. He or she may have already built a reputation on the marketplace maintained by this service provider. Therefore, once an effective relationship has been established, this seller may feel reluctant to switch away from this auction marketplace. In short, sellers become committed to relationships with the service provider that they have invested in substantively [Moorman et al. 1992].

H1: Sellers' perception of relationship quality with an e-commerce service provider has a positive effect on their commitment to this service provider.

It is argued in this study that relationship quality can influence sellers' decision regarding whether they will come back to an online auction service provider and sell things on its marketplace in the future. Defined as a seller's intention to visit and sell things on an online auction service provider's marketplace in the future, seller's retention,

or the expectation of continuity, is rooted strongly in one's perception of the current relationship with the service provider. High retention reflects a favorable perception of the current relationship whereas low retention would be an outgrowth of current relationship problems [Crosby et al. 1990]. It is not surprising that a seller who feels secure and satisfied with his/her current relationship with an e-commerce service provider is more likely to have the intent to come back to and to sell more products on this provider's marketplace [Komiak and Benbasat 2006]. In Crosby et al's research [1990], relationship quality was found to be a significant antecedent of "anticipation of future interaction". In the same vein, Palmatier and colleagues [2006] found a significant relationship between relationship quality and continuity. De Wulf and colleagues [2001] also found that relationship quality affects customers' behavioral loyalty significantly.

In information systems research, it has also been found that trust can significantly influence behavioral intentions [e.g., Gefen et al. 2003a; Gefen et al. 2003b; McKnight et al. 2002; Pavlou 2003; Pavlou and Gefen 2004; van der Heijden et al. 2003]. Similarly, satisfaction has also been found to have a significant impact on behavioral intentions or actual system usage [e.g., Bhattacharjee 2001; Bhattacharjee and Premkumar 2004; Gelderman 1998; Igbaria and Tan 1997; Petter and McLean 2009; Torkzadeh and Doll 1999]. Taken together, the above evidence suggests that:

H2: A sellers' perception of the relationship quality with an online e-commerce service provider has a positive effect on his/her retention.

Relationship commitment has been proposed to be one of the primary drives of customer retention [Gustafsson et al. 2005]. Committed sellers are more likely to maintain the relationship, even if it comes with a cost, and return to the marketplace in the future. Indeed, commitment by definition has a temporal dimension indicating that the relationship exists over time, which implies retention [Garbarino and Johnson 1999; Gundlach et al. 1995] and Garbarino and Johnson [1999] found that commitment was significantly related to future intention to return. Similarly, commitment was confirmed to predict the continuity of the relationship [Palmatier et al. 2006]. Park and Kim [2003] also showed that customer commitment leads to future purchase behavior. Combined, it is hypothesized that:

H3: Sellers' commitment to an online e-commerce service provider has a positive effect on their retention.

2.3. Antecedents of Relationship Quality

To conceptualize the attributes of the e-commerce system, this study refers to DeLone and McLean's E-commerce Success Model [2004]. Based on a comprehensive review of studies on their original IS Success Model [1992], DeLone and McLean offered a revised IS Success model [2003]. One of the key revisions is the inclusion of service quality [Petter and McLean 2009]. Service quality was added because "the changing nature of IS required the need to assess service quality when evaluating IS success" [Petter and McLean 2009 p.160]. They [2004] later tailored the revised IS Success Model to the e-commerce context, resulting in the E-commerce Success Model. According to the E-commerce Success Model, there are three types of attributes of the e-commerce system, whose qualities can be labeled as information quality, system quality, and service quality. It is noteworthy that information quality and system quality were believed sufficient to capture the essential attributes of information systems until recently, when service quality began to be perceived as important with the advent of e-commerce and the customer's demand for support from e-commerce service providers [Molla and Licker 2001; Pitt et al. 1995]. Below are brief descriptions of these three attributes, mostly from DeLone and McLean's [2004] and Wixom and Todd's [2005] work.

- **Information quality** refers to the e-commerce web content issues and covers the completeness, accuracy, format, and currency aspects of information delivered by e-commerce marketplaces [Wixom and Todd 2005].
- **System quality** measures the desired characteristics of an e-commerce system. It usually covers the usability, reliability, responsiveness, flexibility, integration, navigation, accessibility, and timeliness of the e-commerce system [DeLone and McLean 2004].
- **Service quality** measures the overall support delivered by online vendors "regardless of whether the support is delivered by the IS department or a new organizational unit or is outsourced to an Internet service provider." [DeLone and McLean 2004 p.34].

Information quality

As mentioned earlier, the traditional human-to-human business interaction has been replaced by human-to-machine interaction in the context of e-commerce [Parasuraman and Grewal 2000]. A large part of the interactions between e-commerce service providers and their customers is mediated by e-commerce websites, and it is through an e-commerce service provider's website that customers can obtain information about the product, the service

provider, and services provided by third-party institutions such as escrow services and credit card companies. Therefore, the attributes of an e-commerce service provider's website directly affect the sellers' perceptions of their relationship with this service provider, just as a salesperson's attributes affect customer's perceptions of and attitudes towards the company that the salesperson represents [Swan and Nolan 1985]. Crosby and colleagues [1990] confirmed that salespersons' attributes such as domain expertise — which could be seen as equivalent to the information quality of a website in the e-commerce context — influence salespersons' relationships with their customers.

Furthermore, providing accurate, current, well-formatted and complete information is considered an important prerequisite for trust [Flavian et al. 2006; Wang and Emurian 2005] and satisfaction [Cyr 2008; DeWulf et al. 2006; Molla and Licker 2001; Szymanski and Hise 2000]. First, a website with accurate, complete, and current information is more likely to be perceived as trustworthy than a website that has inaccurate, incomplete, and outdated information. Pavlou and colleagues [2007] explicitly confirmed that information-related concerns about e-commerce websites, such as information security and information privacy, influence users' perceptions of the uncertainty of their relationship with the online vendors maintaining these websites. Second, information quality can also influence customer satisfaction [Szymanski and Hise 2000]. Liang and colleagues [2007b] and Fung [2008] found that information personalization can affect satisfaction significantly. In the same vein, Cyr [2008] confirmed that an effectively designed e-commerce website that conveys accurate information about products and services to a user can lead to customer satisfaction.

Combining the above arguments, it is reasonable to expect that sellers using an online auction marketplace are likely to perceive that they have high quality relationships with this service provider if its website conveys high quality information.

H4: *Sellers' perception of the information quality of an e-commerce service provider's website has a positive effect on the sellers' perception of the quality of their relationship with this service provider.*

System quality

System quality usually refers to such attributes of an e-commerce website as usability, ease of use, download time, system responsiveness, navigation, adaptability, and flexibility [Liu and Arnett 2000; Palmer 2002]. People do not trust and are dissatisfied with a system that is down frequently, responds slowly to user requests (e.g., the local search engine is slow in returning and displaying search results), and does not provide a good navigation system. Such a system may lead users to question its trustworthiness, especially its competence in delivering high quality services, and lead to low user satisfaction. Cyr [2008] confirmed that visual design — an important aspect of system quality that includes the balance, emotional appeal, aesthetics, and the uniformity of an e-commerce site's overall graphical look — can influence trust and satisfaction. Similarly, in studying e-satisfaction, Szymanski and colleagues [2000] identified four antecedents of e-satisfaction. Among them, two factors are of direct relevance to this study: site design and convenience. As mentioned above, site design can damage or foster customers' trust in and satisfaction with an e-commerce service provider. A well-designed website that is of high system quality leads to customer satisfaction in the genre of "a more pleasurable shopping experience being a more satisfying one." [Szymanski and Hise 2000, p.313]. On the other hand, system quality can also influence satisfaction indirectly through convenience. Szymanski and Hise [2000] argued that shopping convenience is crucial for e-satisfaction of online shoppers. This may also hold true for online sellers. Online auction service providers provide high levels of convenience for online selling so that sellers can put their products online in just a few clicks, search competitors' information quickly, manage the bidding process effectively, and collect payments easily. These conveniences can serve to enhance sellers' satisfaction with the service provider. A well-designed website, with seamless site performance such as high speed system responses to user request (e.g., presenting search results quickly to user requests through a search engine), an easy to use navigation system, and reliable system performance, can facilitate such conveniences of online selling and subsequently increase customer satisfaction.

H5: *Sellers' perception of the system quality of an e-commerce service provider's website has a positive effect on sellers' perception of the quality of their relationship with this service provider.*

Service quality

Service quality has been conceived as a "global judgment, or attitude, relating to the superiority of the service" [Parasuraman et al. 1988 p.16]. It is only recently that e-commerce researchers started studying service quality systematically. As mentioned earlier, one of the major revisions made in adapting the original IS Success Model to study e-commerce success was the inclusion of service quality [DeLone & McLean 2003; DeLone & McLean 2004; Pitt et al. 1995]. Similarly, in an attempt to "extend and respecify" DeLone and McLean's IS Success Model, Molla and Licker [2001] included a new factor of "support and service" and argued that it impacts customers' use of and

satisfaction with e-commerce service providers. Overall, e-commerce researchers have generally agreed that service quality is a definitive attribute of e-commerce success.

Delivering high quality services through e-commerce websites is one of the major tasks of e-commerce service providers. Since service quality pertains to such attributes as the quick responsiveness, assurance, reliability, empathy, and follow-up service of an e-commerce service provider [Liu & Arnett 2000], it captures the support components of e-commerce systems [Molla & Licker 2001]. An e-commerce service provider that offers prompt, reliable, and caring services is perceived as honest, predictable, and as keeping the customer's best interests at heart, and consequently likely enjoys high customer satisfaction. Spreng [1996] empirically confirmed this significant impact of service quality on user satisfaction. Therefore, this study argues that:

H6: *Sellers' perception of the service quality of an e-commerce service provider has a positive effect on sellers' perception of their relationship quality with this service provider.*

3. Method

3.1. Survey Administration

To test the research model, an online survey was conducted. An online questionnaire was designed using Active Server Pages (ASP) and Microsoft Access. The questionnaire was reviewed by experienced researchers and practitioners at uBid.com, an online auction service provider, who provided suggestions on the content and wording of the items and the overall design of the questionnaire. Their suggestions were integrated and the questionnaire was revised accordingly. With approval from top managers in the company, a contact person at uBid.com sent a recruitment letter with the hyperlink to the online questionnaire to 1500 randomly selected uBid.com sellers. Three gift cards of \$100 each were raffled off as incentives. To enhance the response rate, a reminder email was sent one week later. Among all the responses, thirty-six had at least one third of all the questions unanswered and thus were dropped, resulting in a final sample of 140 responses. Table 1 shows the demographic characteristics of the sample.

A wave analysis was conducted to assess the non-response bias. Specifically, using SPSS, the early responses (the first 10% of the sample) with the late responses (the last 10% of the sample) were compared in terms of their demographic data. None of the demographic characteristics were different between these two groups at the .05 significance level. Therefore, the non-response bias should not be a significant issue for this study.

Table 1: Demographic Characteristics of the Sample

Variables	Sample Composition	
Age	Mean=41; std.dev=13; range 22-75	
Gender	Female	27%
	Male	73%
Highest Education Level Attained	Graduate Degree	18%
	Some Graduate Work	6%
	University or College Degree	37%
	Some University of College	25%
	Secondary School or Less	13%
Number of Previous Bids	1-3	8%
	3-10	18%
	More than 10	74%
Number of Anticipated Future Bids within a Month	1-3	22%
	3-10	28%
	More than 10	50%

3.2. Instrument

Information quality. Measures for information quality were adapted from Wixom and Todd [2005]. Information quality is conceived in this paper as a latent construct that has four reflective items for measuring: information accuracy, information completeness, information format, and information currency respectively.

System quality. This study adapted five items from Wixom and Todd [2005]. These items measure system reliability, system flexibility, system accessibility, system integration, and system timeliness, respectively. These five items are, in essence, reflective of system quality.

Service quality. A candidate measurement was SERVQUAL, a widely-utilized instrument of service quality. However, this study did not use it because it has been argued that SERVQUAL is mainly for non-Internet system users, such as those in organizations [Parasuraman et al. 1988]. It was often found that the items of SERVQUAL did not properly apply in the research context of this paper. This choice is supported by the fact that prior researchers had similar findings when working with SERVQUAL. For instance, Bhattacharjee [2001] argued that SERVQUAL is inapplicable for web-based services provided by e-commerce service providers, considering their remote and anonymous nature, considering that SERVQUAL is appropriate only when users are familiar with the service provider's conditions such as their employees, hardware, software, and availability, among others. As a result, this study developed a new two-item instrument for measuring the service quality of an e-commerce system, imitating Wixom and Todd's instrument [2005]. These two items measure sellers' overall assessment of the services provided by uBid.com. The measurement of the overall assessment of the service quality is consistent with prior research [Spreng et al. 1996].

Relationship quality. Relationship quality was conceived as a second-order reflective construct. It has two first-order sub-constructs, trust and satisfaction, each of which has reflective items. Affective trust was measured by three items adapted from Komiak and Benbasat's work [2006]. Items for relationship satisfaction and commitment were adopted from De Wulf et al.'s seminal work on relationship quality [2001].

Commitment. This study adapted three items for measuring commitment from De Wulf et al.'s work [2001].

Retention. The conception of sellers' retention has two components: intention to use/visit and intention to sell in the future. Both intentions — intention to use and intention to sell — were included because visiting a service provider's website and selling through this website are two indispensable, albeit distinct, aspects of online selling. One item measuring intention to use adapted was from the user technology acceptance research [Davis 1989] and one item measuring intention to sell from Koufaris [2002].

Appendix A lists the instruments used. Consistent with their original sources, all constructs in the research model were modeled as reflective because their measurement items are manifestations of the constructs and co-vary [Diamantopoulos & Winklhofer 2001; Petter et al. 2007]. This study used a seven-point Likert Scale to measure all items, with 1 for "Strongly Disagree," 4 for "Neutral," and 7 for "Strongly agree". Retention is slightly different, with 1 for "Very Unlikely" and 7 for "Very Likely."

4. Data Analysis and Results

4.1. Measurement Model

Partial Least Squares (PLS, version 03.00), a component-based Structural Equation Modeling (SEM) technique was used for data analysis. PLS was utilized because it is robust enough to not require normal data [Barclay et al. 1995]. PLS is regarded as an appropriate statistical tool for early stage research models where the emphasis is on theory exploration, extension, and prediction [Jöreskog & Wold 1982]. It also helps overcome the limitation of the small sample size to some degree [Chin et al. 2003; Fornell & Bookstein 1982; Lohmoller.J. 1989]².

The measurement model was assessed in terms of item loadings, item reliability, and convergent and discriminant validities. Item loadings and composite reliabilities of 0.70 or greater are considered acceptable [Fornell & Larcker 1981]. An Average Variance Extracted (AVE) greater than 0.50 for each construct indicates sufficient convergent validity [Barclay et al. 1995]. To examine the discriminant validity, this study compared the square roots of the AVEs and the correlations between the latent constructs. The average variance shared between each construct and its measures (the square roots of the AVEs) should be greater than the variance shared between the construct and other constructs (correlations) [Compeau et al. 1999].

Three items, for information completeness (IQ2), system reliability (SQ4), and system timeliness (SQ5), were dropped due to low loadings on their respective factors. As we can see in Table 2, the composite reliabilities for all constructs are greater than 0.70 and therefore suggest sufficient reliabilities. The average of variances explained (AVEs) are all greater than 0.50, indicating adequate convergent validities. The square roots of AVEs (diagonal elements in Table 2) are larger than correlations among constructs (off-diagonal elements in Table 2), showing that sufficient discriminant validities of the constructs are observed.

² Some emerging evidence challenges the claim that PLS places minimal demands on sample size [e.g., Marcoulides and Saunders 2006; Qureshi and Compeau 2009]. This is not the focus of this study and is subject for further examinations.

Table 2: Reliability, Convergent and Discriminant Validity Coefficients of the First-Order Constructs

	Composite Reliability	Cronbach's Alpha	AVE	Correlations*							
				IQ	SQ	SvQ	SAT	TR	COM	RET	
IQ	0.91	0.85	0.77	0.88							
SQ	0.88	0.80	0.71	0.79	0.84						
SvQ	0.97	0.94	0.94	0.72	0.76	0.97					
SAT	0.95	0.92	0.86	0.61	0.66	0.70	0.93				
TR	0.96	0.94	0.90	0.74	0.69	0.80	0.79	0.95			
COM	0.94	0.90	0.83	0.50	0.44	0.48	0.79	0.56	0.91		
RET	0.99	0.98	0.98	0.45	0.31	0.38	0.67	0.51	0.73	0.99	
Legend:	IQ: Information Quality			SQ: System Quality							
	SvQ: Service Quality			SAT: Satisfaction							
	TR: Trust			COM: Commitment							
	RET: Retention										
* The diagonal Elements (in bold) are the square roots of the variance shared between the constructs and their measurement (AVE). Off diagonal elements are the correlations among constructs. Diagonal elements should be larger than off-diagonal elements in order to exhibit discriminant validity.											

To examine the unidimensionality of the items, this study referred to Cronbach's alpha. Cronbach's alpha is essentially a measure of the intercorrelations of different items measuring the same construct. A Cronbach's alpha of 0.70 or higher shows that the items are indeed measuring the same thing [Bagozzi & Yi 1988; Bearden et al. 1993]. As we can see from Table 2, all Cronbach's alphas are larger than 0.70, indicating that all the first-order constructs in the research model are unidimensional.

4.2. Common Method Bias

The common method variance refers to the variance attributable to the measurement method rather than to the constructs the measures represent [Podsakoff et al. 2003]. It can mistakenly inflate or deflate the perceived relationships between any two constructs in a research model. Therefore, controlling for common method variance is critical.

This study utilized Podsakoff and colleagues' approach [2003] to systematically control for the potential effects of common method variance. Podsakoff and colleagues [2003] offered several procedural and statistical remedies for controlling common method bias. Procedural remedies included measuring constructs from different sources, temporal, proximal, psychological, and methodological separation of measurement, protecting respondent anonymity, reducing evaluation apprehension, counterbalancing question order, and improving scale items. In situations where researchers have difficulties finding a procedural remedy that meets all of their needs, statistical remedies may be helpful.

Both procedural and statistical remedies were applied to minimize the potential effects of common method bias in this study. First, respondent anonymity was guaranteed. Second, the pre-validated instruments were utilized to minimize the potential influence of ambiguous items, a source of common method variance. Moreover, this study minimized the adaptations of the previously validated instruments to retain construct validity. This study did not obtain the measures of the constructs from different sources though; every subject answered all the questions. Podsakoff and colleagues argued that "despite the obvious advantages of this approach [obtaining measures from different sources], it is not feasible to use in all cases. For example, while examining the relationships between two or more employee job attitudes, researchers cannot obtain measures of these constructs from alternative sources" (p. 887). In short, because all the constructs in the research model were about subjective perceptions and behavioral intention, measures for them have to come from the same source.

Statistical remedies were also applied, largely because the measures were from the same source, as discussed above. This study referred primarily to Liang and colleagues' method that utilizes PLS method to control for common method biases [e.g., Liang et al. 2007a]. Specifically, a new factor called "method" was included in the research model. This method factor included all principle constructs' indicators. Then each indicator's variances, explained respectively by the principle construct and by the method factor, were calculated and compared. Table 3 summarizes the results.

According to Williams et al. [2003], we should pay attention to the significance of the loadings (path coefficients) and the comparison between variances explained by each indicator's principle construct and the method factor respectively. As can be seen from Table 3, the indicators' loadings on the principle constructs are all

significant at the 0.001 level, whereas most of their loadings on the method factor are non-significant. The variances in indicators explained by their principle constructs (average: 0.8495) are much larger than those explained by the method factor (average: 0.0065). The ratio of principle variance to method variance is about 131:1. Given the above results, the method did not contribute substantively to the variances in indicators and therefore was unlikely to be a serious concern for this study.

Table 3: Assessment of the Common Method Bias

Constructs	Indicators	Principle Construct Loading (R1)	Variance Explained by the Principle Construct (R1 ²)	Method Factor Loading (R2)	Variance Explained by the Method Factor (R2 ²)
Information Quality	IQ1 (information accuracy)	0.783***	0.613	0.061	0.004
	IQ3 (information format)	0.909***	0.827	-0.022	0.000
	IQ4 (information currency)	0.930***	0.865	-0.036	0.001
System Quality	SQ1 (system accessibility)	0.679***	0.462	0.112	0.013
	SQ2 (system flexibility)	0.839***	0.704	0.033	0.001
	SQ3 (system integration)	0.997***	0.994	-0.129**	0.017
Service Quality	SVQ1	1.074***	1.153	-0.126*	0.016
	SVQ2	0.869***	0.755	0.121**	0.015
Relationship Quality (Trust)	TR1	0.981***	0.962	-0.028	0.001
	TR2	0.894***	0.798	0.079	0.006
	TR3	0.967***	0.934	-0.055	0.003
Relationship Quality (Satisfaction)	SAT1	0.890***	0.793	0.028	0.001
	SAT2	0.871***	0.759	0.033	0.001
	SAT3	1.014***	1.027	-0.057	0.003
Commitment	COM1	0.854***	0.729	0.094	0.009
	COM2	0.897***	0.805	0.057	0.003
	COM3	1.004***	1.007	-0.171*	0.029
Retention	RET1	0.990***	0.981	-0.004	0.000
	RET2	0.986***	0.972	0.003	0.000
Average		0.9423	0.8495	-0.0002	0.0065
Note: * p < 0.05; ** p < 0.01; *** p < 0.001					

4.3. Structural Model

Unlike covariance-based SEM techniques (e.g., LISREL), PLS does not provide overall model fit statistics. In PLS, we refer to the statistical significance of the structural relationships and R squares as indication of the power of the model. Figure 2 depicts the results of the structural model. Table 4 summarizes the results of hypothesis testing. All hypotheses were confirmed. Hypothesis 1 is about the positive impact of relationship quality on commitment. This hypothesis is confirmed ($b=0.716$, $t=14.324$, $p<0.001$): The higher the perceived relationship quality, the more likely a person will develop a strong commitment to a marketplace. Hypothesis 2 is about the positive impact of relationship quality on retention. It is also confirmed ($b=0.217$, $t=9.304$, $p<0.001$). That means that one's perceived relationship quality determines his/her decision to come back to a marketplace. In addition, commitment also has significant effects on retention ($b=0.573$, $t=8.244$, $p<0.001$). Therefore, Hypothesis 3 was also confirmed.

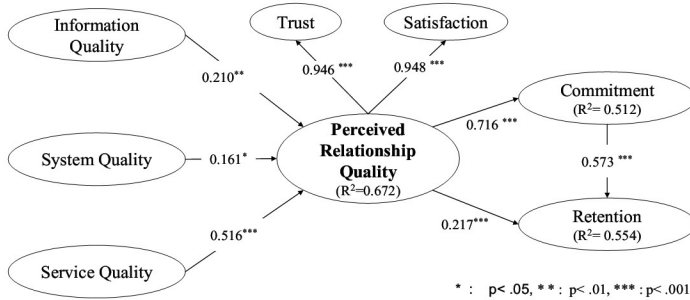


Figure 2: The structural model

Table 4: Results of Hypothesis Testing

Hypothesis			β	T value	
H1 (✓)	Relationship quality	→	Commitment	0.716***	14.324
H2 (✓)	Relationship quality	→	Retention	0.217***	9.304
H3 (✓)	Commitment	→	Retention	0.573***	8.244
H4 (✓)	Information quality	→	Perceived relationship quality	0.210**	3.016
H5 (✓)	System quality	→	Perceived relationship quality	0.161*	2.283
H6 (✓)	Service quality	→	Perceived relationship quality	0.516***	7.194
* Significant at $p<0.05$; ** $p<0.01$; *** $p<0.001$					

The study also confirms the significant impact of the three antecedents of perceived relationship quality. Hypothesis 4 posits that information quality affects perceived relationship quality significantly. This hypothesis is confirmed ($b=0.210$, $t=3.016$, $p<0.01$). Thus, high information quality, characterized by accurate, well-formatted, and current information, can lead to customers' perception of a high relationship quality. Hypothesis 5 is about the positive impact of system quality on perceived relationship quality. It is also confirmed in that system quality — reflected by system flexibility, system accessibility, and system integration — turned out to affect perceived relationship quality significantly ($b=0.161$, $t=2.283$, $p<0.05$). Service quality, measured by two overall evaluation items, was found to have a significant impact on relationship quality ($b=0.516$, $t=7.194$, $p<0.001$). Hypothesis 6 is therefore confirmed as well.

The model explains a significant amount of variances in sellers' retention, commitment ($R^2=51.2\%$), and relationship quality ($R^2=67.2\%$), indicating the robustness of the research model. Specifically, perceived relationship quality and commitment jointly explains 55.4% of the variance in customer retention. Perceived relationship quality alone accounts for 51.2% of the variance in commitment, showing the importance of relationship quality in enhancing customer commitment. Information quality, system quality, and service quality together explains 67.2% of the variance in perceived relationship quality. This indicates the significant role of the attributes of e-commerce systems in influencing customers' perception of their relationship with the intermediary.

5. Discussions

Attributes of e-commerce systems can and should be leveraged to maximize the benefits to a business. Despite their importance, the mechanisms through which the attributes of e-commerce systems affect business benefits have been relatively unclear. This study specifies how IT attributes, manifested as information quality, system quality, and service quality, influence business benefits through relationship quality. An empirical study using a sample of 140 online sellers confirmed the importance of relationship quality in transferring the quality of the attributes of e-commerce systems into business benefits.

5.1. Limitations

Readers should be aware of the limitations of this research when interpreting the findings. First, this study focused merely on online auction sellers. More investigations are needed to examine if the findings are applicable to buyers as well. Second, the sample size is relatively small. Due to uBid's strong commitment to protect sellers' privacy, this study did not get direct access to as many sellers as wanted. Although using PLS helped us overcome the limitation of the sample size to some degree, a larger sample size is desired. Third, this study did not control for the potential impact of culture. Cyr [2008] argued that attributes of e-commerce websites have different impacts in different cultural contexts. Therefore, studying the potential cultural impact on the relationships is of merit, especially considering that global business is ubiquitous in e-commerce. Finally, the measures for service quality were ad hoc and thus this study calls for systematic studies on a robust measurement of service quality. As mentioned earlier, this study did not find a good measurement of service quality for this study, and instead self-developed a two-item instrument for measuring service quality, imitating Wixom and Todd's measures for information quality and system quality [2005]. Although this kind of ad hoc instrument is not rare in IS research, it may be insufficient. The relatively high correlations in Table 2 further show the limitation of the measures used for service quality. Future research that systematically develops comprehensive and robust instruments for service quality is well worth the effort.

5.2. Contributions

The contributions of this research are as follows. First, based on the marketing literature on relationship quality, this study specified a mechanism through which attributes of e-commerce systems influence customer commitment and customer retention. Relationship quality has not been systematically examined in IS research. As mentioned earlier, studying relationship quality has advantages: it synthesizes extant scattered research on trust and satisfaction in IS research and leads to the rich marketing literature on business benefits factors.

Second, this paper enriches the traditional definition of relationship quality in marketing literature by including affective trust as an additional component of relationship quality. In light of the fact that affective trust has only recently received attention from IS researchers [Komiak & Benbasat 2006], this revision serves to enhance our understanding of trust in both IS and marketing literature.

Third, this research provides empirical evidence for the importance of service quality in e-commerce success. Service quality has received relatively little attention in the literature thus far, despite its importance in the success of e-commerce [DeLone & McLean 2004]. There is a dearth of empirical investigations into service quality in e-commerce research. This study reiterates the call for more investigations into service quality, given the current lack of systematic research on it. Developing a robust and comprehensive instrument for measuring service quality may be a good place to start.

Fourth, this study focused on sellers. Sellers are also customers of e-commerce systems and are important for e-commerce success, though, little prior research has been conducted from the seller's perspective. So far, research has been conducted primarily from the buyer's perspective alone.

5.3. Research Implications

First of all, based on the findings of this research, this study calls for IS researchers to pay more attention to relationship quality. Customer relationships are of keen interest to many firms; more and more firms are actually organizing their marketing efforts around customers rather than product lines as they have traditionally done [Hogan et al. 2002]. Investing in customer assets is viewed as an investment that can create long-term value for firms and their shareholders [Hogan et al. 2002; Rust et al. 2004]. This research details how such arguments seem to hold true

in e-commerce contexts as well. More IS research on how relationship quality can be enhanced and can impact business benefits is necessary and will have a great deal of practical value.

The empirical results of this study show that information quality has significant impact on relationship quality. Providing complete, accurate, current, and well-formatted information is thus important for maintaining high quality relationships with customers. Considering that it is impossible to avoid all mistakes and errors in offering online information, studying to what extent low information quality (e.g., misinformation and disinformation) may damage customer perceptions of their relationships with the service provider would be a promising future research area. Also, additional research can focus on personalized information for users, which is believed to be crucial in affecting customers' commitment to a website [Fung 2008].

System quality is also found to affect relationship quality significantly. Designing and maintaining accessible, flexible, and integrative systems is important for building customers' perception of a strong relationship quality. Future research can focus on other aspects of system design such as design aesthetics that may have impact on customers [Cyr et al. 2006].

This study highlights the importance of service quality in e-commerce success, a relatively understudied topic. Little research has focused on service quality in e-commerce [DeLone & McLean 2004; Petter & McLean 2009], despite that marketing research has confirmed the importance of service quality [Spreng et al. 1996]. The widely-utilized IS Success Model had focused merely on information quality and system quality until recently, when service quality was introduced as a new dimension of e-commerce success [DeLone & McLean 2004]. As Pitt, Watson, and Kavan argued [1995 p.173], "Commonly used measures of IS effectiveness focus on the products rather than the services of the IS function. Thus, there is a danger that IS researchers will mis-measure IS effectiveness if they do not include a measure of IS service quality in their assessment package." The empirical results demonstrated the importance of service quality in e-commerce. As a matter of fact, with the highest path coefficient, service quality turned out to be the most significant antecedent of relationship quality among the three attributes of e-commerce systems. In light of the fact that services have received more and more attention recently from practitioners who are "looking for services to distinguish themselves in a world characterized by intense competition and rapid technological change" [Smith-Damiels 2007 p.187], further research on service quality is of apparent importance. This is especially true in light of the fact that a recent meta-analysis conducted by Petter and McLean [2009] did not find a significant relationship between service quality and satisfaction. More empirical studies about the impact of perceived service quality on perceived relationship quality or its components, i.e., trust and satisfaction, are needed.

The measurements of information quality, system quality, and service quality need to be improved. During the data collection and analysis stage, one item of information quality and two items of system quality were dropped due to low loadings on their primary constructs. Service quality, on the other hand, was measured by two ad hoc items. Systematic development of a measurement for service quality will be exceedingly valuable to future research.

5.4. Practical Implications

The findings from this research have fairly wide-reaching practical implications. Researchers have been attempting to provide actionable suggestions for how to promote trust in online experiences [e.g., Shneiderman 2000]. This research shows how the attributes of e-commerce systems — in the form of information quality, system quality, and service quality — influence customer retention through relationship quality. Relationship quality is the "glue" that can enhance the "stickiness" of the relationship between customers and the firm [Lemon et al. 2001]. Other than the traditional marketing approaches such as loyalty programs, special recognition and treatment, affinity programs, community building programs, and knowledge-building programs [Lemon et al. 2001], IT practitioners can contribute to improving customers' commitment and retention through leveraging the information, system, and service attributes of their e-commerce systems. IT Practitioners need to redefine the meaning of success of their e-commerce systems: the number of visitors and registrants should not be the only criterion for defining a system's success. IT practitioners should coordinate with their marketing colleagues to provide accurate, well-formatted, and current information, accessible and flexible integrative systems, and high quality services.

Acknowledgment

I would like to thank Professor Ping Zhang at Syracuse University for her contributions to this paper. This paper is partially funded by uBid.com.

REFERENCES

- Bagozzi, R.P., and Yi, Y. "On the Evaluation of Structural Equation Models," *Journal of the Academy of Marketing Science* (16:1), 1988.
- Barclay, D., Higgins, C.A., and Thompson, R.L. "The Partial Least Squares (PLS) Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration," *Technology Studies* (2:2), 285-309 1995.

- Bearden, W.O., Netemeyer, R.G., and Mobley, M.F. *Handbook of Marketing Scales: Multi-Item Measures for Marketing and Consumer Behavior Research* Sage Publications, Newbury Park, CA1993.
- Benbasat, I., and Barki, H. "Quo vadis, TAM?," *Journal of the Association for Information Systems* (8:4), 211-218 April 2007.
- Bhattacharjee, A. "Understanding information systems continuance: An expectation-confirmation model," *MIS Quarterly* (25:3), 351-370 2001.
- Bhattacharjee, A., and Premkumar, G. "Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test," *MIS Quarterly* (28:2), 229-254 2004.
- Carr, C.L. "Reciprocity: The golden rule of IS-user service relationship quality an cooperation," *Communication of the ACM* (49:6), 77-83 2006.
- Chin, W.W., Marcolin, B.L., and Newsted, P.R. "A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study," *Information Systems Research* (14:2), 189-217 2003.
- Compeau, D.R., Higgins, C.A., and Huff, S. "Social cognitive theory and individual reactions to computing technology: A longitudinal study," *MIS Quarterly* (23:2), 145-158 June 1999.
- Crosby, L.A., Evans, K.A., and Cowles, D. "Relationship quality in services selling: An interpersonal influence perspective," *Journal of Marketing* (54:3), 68-81 1990.
- Cyr, D. "Modeling web site design across cultures: relationships to trust, satisfaction, and e-loyalty," *Journal of Management Information Systems* (24:4), 47-72 2008.
- Cyr, D., Head, M., and Ivanov, A. "Design Aesthetics Leading to m-Loyalty in Mobile Commerce," *Information & Management* (43:8), 950-963 2006.
- Davis, F.D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly* (13:3), 319-342 September 1989.
- De Wulf, K., Odekerken-Schroder, G., and Lacobucci, D. "Investments in consumer relationships: A cross-country and cross-industry exploration," *Journal of Marketing* (65:4), 33-50 2001.
- De Wulf, K., Schillewaert, N., Muylle, S., and Rangarajan, D. "The role of pleasure in Web site success," *Information and Management* (43:4), 434-446 2006.
- DeLone, W.H., and McLean, E.R. "Information systems success: The quest for the dependent variable," *Information Systems Research* (3), 60-95 1992.
- DeLone, W.H., and McLean, E.R. "The DeLone and McLean model of information systems success: A ten-year update," *Journal of Management Information Systems* (19:4), 9-30 Spring 2003.
- DeLone, W.H., and McLean, E.R. "Measuring e-commerce success: Applying the DeLone & McLean information systems success model," *International Journal of Electronic Commerce* (9:1), 31-47 Fal 2004.
- Diamantopoulos, A., and Winklhofer, H.M. "Index construction with formative indicators: An alternative to scale development," *Journal of Marketing Research* (38:2), 269-277 2001.
- Dorsch, M.J., Swanson, S.R., and Kelley, S.W. "The role of relationship quality in the stratification of vendors as perceived by customers," *Journal of the Academy of Marketing Science* (26:2), 128-142 1998.
- Dwyer, F.R., Schurr, P.H., and Oh, S. "Developing Buyer-Seller Relationships," *Journal of Marketing* (51), 11-27 1987.
- Evanschitzky, H., Iyer, G.R., Hesse, J., and Ahlert, D. "E-satisfaction: A re-examination," *Journal of Retailing* (80), 239-247 2004.
- Flavian, C., Guinaliu, M., and Gurrea, R. "The role played by perceived usability, satisfaction and consumer trust on website loyalty," *Information & Management* (43), 1-14 2006.
- Fornell, C., and Bookstein, F. "Two structural equation models: LISREL and PLS applied to consumer exit-voice theory," *Journal of Marketing Research* (19), 440-452 1982.
- Fornell, C., and Larcker, D. "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research* (18), 39-50 1981.
- Fung, T.K.F. "Banking with a personalized touch: examining the impact of website customization on commitment," *Journal of Electronic Commerce Research* (9:4), 296-309 2008.
- Garbarino, E., and Johnson, M.S. "The different roles of satisfaction, trust, and commitment in customer relationships," *Journal of Marketing* (63), 70-87 1999.
- Gefen, D., Karahanna, E., and Straub, D. "Inexperience and Experience with Online Stores: The Importance of TAM and Trust," *IEEE Transactions on Engineering Management* (50:3), 307-321 2003a.
- Gefen, D., Karahanna, E., and Straub, D.W. "Trust and TAM in Online Shopping: An Integrated Model," *MIS Quarterly* (27:1), 51-90 March 2003b.

- Gelderman, M. "The relation between user satisfaction, usage of information systems and performance," *Information & Management* (34:1), 11-18 1998.
- Gundlach, G.T., Achroi, R.S., and Mentzer, J.T. "The Structure of Commitment in Exchange," *Journal of Marketing* (59), 78-92 1995.
- Gustafsson, A., Johnson, M.D., and Roos, I. "The Effects of Customer Satisfaction, Relationship Commitment Dimensions, and Triggers on Customer Retention," *Journal of Marketing* (69), 210-218 2005.
- Hardwick, B., and Ford, D. "Industrial buyer rescues and responsibilities and the buyerseller relationships," *Industrial Marketing and Purchasing* (1), 3-25 1986.
- Hennig-Thurau, T., and Klee, A. "The impact of customer satisfaction and relationship quality and customer retention: A critical reassessment and model development," *Psychology & Marketing* (14:8), 737-764 1997.
- Hogan, J.E., Lemon, K.N., and Rust, R.T. "Customer equity management: Charting new directions for the future of marketing," *Journal of Service Research* (5:1), 4-12 2002.
- Igarria, M., and Tan, M. "The consequences of information technology acceptance on subsequent individual performance," *Information & Management* (32:3), 113-121 1997.
- Johnson-George, C.E., and Swap, W.C. "Measurement of specific interpersonal trust: Construction and validation of a scale to access trust in a specific other," *Journal of Personality and Social Psychology* (43), 1306-1317 1982.
- Jöreskog, K.G., and Wold, H. "The ML and PLS techniques for modeling with latent variables: Historical and comparative aspects," in: *Systems under indirect observation: Causality, structure, prediction*, K.G. Jöreskog and H. Wold (eds.), North Holland, Amsterdam, 263-270, 1982.
- Kelton, K., Fleischmann, K.R., and Wallace, W.A. "Trust in digital information," *Journal of the American Society for Information Science and Technology* (59:3), 363-374 2008.
- Komiak, S.Y.X., and Benbasat, I. "The Effects of Personalization and Familiarity on Trust and Adoption of Recommendation Agents," *MIS Quarterly* (30:4) 2006.
- Koufaris, M. "Applying the technology acceptance model and flow theory to online consumer behavior," *Information Systems Research* (13:2), 205-223 June 2002.
- Kumar, N., Scheer, L.K., and Steenkamp, J.-B.E.M. "The effects of supplier fairness on vulnerable resellers," *Journal of Marketing Research* (32:1), 54-65 1995.
- Lages, C., Lages, C.R., and Lages, L.F. "The RELQUAL scale: A measure of relationship quality in export market ventures," *Journal of Business Research* (58), 1040-1048 2005.
- Lemon, K.N., Rust, R.T., and Zeithaml, V.A. "What Drives Customer Equity," *Marketing Management* (10:1), 20-25 2001.
- Leuthesser, L. "Supplier relational behavior: An empirical assessment," *Industrial Marketing Management* (26:3), 245-254 1997.
- Lewis, J.D., and Weigert, A. "Trust as a social reality," *Social Forces* (63:4), 967-985 1985.
- Liang, H., Saraf, N., Hu, Q., and Xue, Y. "Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management," *MIS Quarterly* (31:1), 59-87 2007a.
- Liang, T.P., Lai, H.J., and Ku, Y.C. "Personalized Content Recommendation and User Satisfaction: Theoretical Synthesis and Empirical Findings" *Journal of Management Information Systems* (23:3), 45 - 70 2007b.
- Liu, C., and Arnett, K.P. "Exploring the factors associated with Web site success in the context of electronic commerce," *Information & Management* (38:1), 23-33 2000.
- Lohmoller, J. *Latent variable path modelling with partial least squares* Physica-Verlag, Heidelberg, Germany 1989.
- Marcoulides, G.A., and Saunders, C. "PLS: A Silver Bullet?," *MIS Quarterly* (30:2) 2006.
- Massey, A.P., Khatri, V., and Montoya-Weiss, M.M. "Usability of online services: The role of technology readiness and context," *Decision Sciences* (38:2), 277-308 2007.
- McAllister, D.J. "Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations," *The Academy of Management Journal* (38:1), 24-59 1995.
- McKnight, D., Choudhury, V., and Kacmar, C. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3), 334-359 2002.
- Mcknight, D.H., Cummings, L.L., and Chervany, N.L. "Initial trust formation in new organizational relationships," *Academy of Management Review* (23:3), 473-490 1998.
- Meuter, M.L., Ostrom, A.L., Roundtree, R.I., and Bitner, M.J. "Self-service technologies: Understanding customer satisfaction with technology-based service encounters," *Journal of Marketing* (64:3), 50-64 2000.
- Molla, L., and Licker, P.S. "e-commerce systems success: An attempt to extend and respecify the DeLone and McLean Model of IS Success," *Journal of Electronic Commerce Research* (2:4), 131-141 2001.

- Moorman, C., Zaltman, G., and Deshpandé, R. "Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations," *Journal of Marketing Research* (29), 314–329 1992.
- Palmatier, R.W., Dant, R.P., Grewal, D., and Evans, K.R. "Factors Influencing the Effectiveness of Relationship Marketing: A Meta-Analysis," *Journal of Marketing* (70), 136–153 2006.
- Palmer, J.W. "Web site usability, design, and performance metrics," *Information Systems Research* (13:2), 151-167 June 2002.
- Parasuraman, A., and Grewal, D. "The impact of technology on the quality-value-loyalty chain: A research agenda," *Journal of the Academy of Marketing Science* (28:1), 168-174 2000.
- Parasuraman, A., Zeithaml, V.A., and Berry, L.L. "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality," *Journal of Retailing* (64:1), 12-40 1988.
- Park, C.H., and Kim, Y.G. "Identifying key factors affecting consumer purchase behavior in an online shopping context," *International Journal of Retail & Distribution Management* (31:1), 16–29 2003.
- Pavlou, P.A. "Consumer acceptance of electronic commerce: Integrating trust and risk with the Technology Acceptance Model," *International Journal Of Electronic Commerce* (7:3), 101-134 2003.
- Pavlou, P.A., and Gefen, D. "Building effective online marketplaces with institution-based trust," *Information Systems Research* (15:1), 37-59 Mar 2004.
- Pavlou, P.A., Liang, H., and Xue, Y. "Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective," *MIS Quarterly* (31:1), 105-136 2007.
- Petter, S., and McLean, E.R. "A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level," *Information & Management* (46:3), 159-166 2009.
- Petter, S., Straub, D., and Rai, A. "Specifying formative constructs in information systems research," *MIS Quarterly* (31:4), 623-656 2007.
- Pitt, L.F., Watson, R.T., and Kavan, C.B. "Service Quality: A Measure of Information Systems Effectiveness," *MIS Quarterly* (19:2), 173-187 1995.
- Podsakoff, P., MacKenzie, S., Lee, J., and Podsakoff, N. "Common method biases in behavioral research: A critical review of the literature and recommended remedies," *Journal Of Applied Psychology* (88:5), 879-903 2003.
- Qureshi, I., and Compeau, D. "Assessing between-group differences in information systems research: A comparison of covariance- and component-based SEM," *MIS Quarterly* (33:1), 197-214 2009.
- Rempel, J.K., Holmes, J.G., and Zanna, M.D. "Trust in close relationships," *Journal of Personality and Social Psychology* (49), 95-112 1985.
- Rust, R.T., Lemon, K.N., and Narayandas, D. *Customer equity management* Prentice Hall, Upper Saddle River 2004.
- Sarkar, M.B., Butler, B., and Steinfield, C. "Intermediaries and cybermediaries: A continuing role for mediating players in the electronic marketplace," *Journal of Computer-Mediated Communication* (1:3) 1995.
- Seddon, P.B. "A respecification and extension of the DeLone and McLean model of IS success," *Information Systems Research* (8:3), 240-253 1997.
- Shneiderman, B. "Designing Trust into Online Experiences," *Communications of the ACM* (43:12), 57-59 2000.
- Smith-Daniels, V. "In this issue," *Decision Sciences* (38:2), 187-193 2007.
- Spreng, R.A., MacKenzie, S.B., and Olshavsky, R.W. "A reexamination of the determinants of consumer satisfaction," *Journal of Marketing* (60:3), 15-32 1996.
- Swan, J.E., Bowers, M.R., and Richardson, L.D. "Customer trust in the salesperson: An integrative review and meta-analysis of the empirical literature," *Journal of Business Research* (44), 93-107 1999.
- Swan, J.E., and Nolan, J.J. "Gaining customer trust: A conceptual guide for the salesperson," *Journal of Personal Selling & Sales Management*, 39-47 November 1985.
- Swan, J.E., Trawick, I.F.J., Rink, D.R., and Roberts, J. "Measuring dimensions of purchaser trust of industrial salespeople," *Journal of Personal Selling & Sales Management* (8), 1-9 May 1988.
- Szymanski, D., and Hise, R. "E-Satisfaction: An Initial Examination," *Journal of Retailing* (76:3), 309-322 2000.
- Torkzadeh, G., and Doll, W.J. "The development of a tool for measuring the perceived impact of information technology on work," *Omega-International Journal of Management Science* (27:3), 327-339 1999.
- van der Heijden, H., Verhagen, T., and Creemers, M. "Understanding online purchase intentions: contributions from technology and trust perspectives," *European Journal of Information Systems* (12), 41-48 2003.
- Wang, Y.-S., Tang, T.-I., and Tang, J.-T.E. "An Instrument for Measuring Customer Satisfaction Toward Web Sites That Market Digital Products and Services," *Journal of Electronic Commerce Research* (2:3), 89-102 2001.
- Wang, Y.d., and Emurian, H.H. "Trust in e-commerce: Considerations of interface design factors," *Journal of E-Commerce in Organizations* (3:4), 42-60 2005.

- Williams, L.J., Edwards, J.R., and Vandenberg, R.J. "Recent advances in causal modeling methods for organizational and management research," *Journal of Management* (29:6), 903-936 2003.
- Wilson, D.T., and Vlosky, R.P. "Interorganizational information system technology and buyer-seller relationship," *Journal of Business & Industrial Marketing* (13:3), 215-234 1998.
- Wixom, B.H., and Todd, P.A. "A theoretical integration of user satisfaction and technology acceptance," *Information Systems Research* (16:1), 85-102 2005.

APPENDIX A: Constructs and Measures

Constructs		Manifest variables	Scales
Retention		RET1. How likely is it that you will visit uBid.com again in the future?	Seven-Point Likert Scale 1: "Very Unlikely" 4, "Neutral" 7 "Very Likely"
		RET2. How likely is it that you will sell things again at uBid in the future?	
Relationship Quality _ Trust		TR1. I feel secure about relying on uBid.com for my auctions.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
		TR2. I feel comfortable about relying on uBid.com for my auctions.	
		TR3. I feel content about relying on uBid.com for my auctions.	
Relationship Quality _ Satisfaction		SAT1. As a uBid.com seller, I have a high-quality relationship with it.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
		SAT2. I am happy with the efforts uBid.com is making towards sellers like me.	
		SATS3. I am satisfied with the relationship I have with uBid.com.	
Information Quality	Information accuracy	IQ1: The information provided by uBid.com is accurate.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
	Information completeness (dropped)	IQ2: uBid.com provides me with a complete set of information.	
	Information format	IQ3: The information provided by uBid.com is clearly presented on the screen	
	Information currency	IQ4: The information from uBid.com is always up to date.	
System Quality	System accessibility	SQ1: uBid.com makes information easy to access.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
	System flexibility	SQ2: uBid.com can be adapted to meet a variety of needs.	
	System integration	SQ3: uBid.com pulls together information that used to come from different sources.	
	System reliability (dropped)	SQ4: uBid.com performs reliably.	
	System timeliness (dropped)	SQ5: uBid.com returns answers to my requests quickly.	
Service Quality		SvQ1. Overall, I would give the service from uBid.com high marks.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
		SvQ2. In general, I would give the quality of services provided by uBid.com a high rating.	
Commitment		COM. I am willing to make efforts to remain a seller of uBid.com.	Seven-Point Likert Scale 1: "Strongly Disagree" 4, "Neutral" 7 "Strongly Agree"
		COM2. I fell loyal towards uBid.com.	
		COM3. Even if uBid.com would be more difficult to use, I would still keep selling there.	