

# A Research Model of Relationship Quality in E-Commerce: Connecting IS Factors with Marketing Profitability<sup>1</sup>

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## Abstract

Customer relationship, commitment and retention are critical for e-commerce success. Existing IS research has studied e-commerce customers more from a system user perspective. We argue in this study that we should also take a customer perspective, which has significant research and practical implications in that it connects to business profitability directly. As our first attempt, this study, referring to both IS and marketing literature, examines how customer commitment and retention can be achieved to some degrees by high quality relationships with customers, which, from an information systems perspective, are influenced by the information, system and service qualities of e-commerce service providers (e.g., eBay.com). Using a sample of 140 online auction sellers at uBid.com, we empirically confirm that relationship quality is an important factor that mediates the impacts of IS factors (i.e., information, system and service qualities) on business profitability factors (i.e., customer commitment and retention).

**[Keyword]:** information quality, system quality, service quality, relationship quality, customer commitment, customer retention, online auction, sellers.

It has been argued that keeping current customers is more cost saving than attracting new customers (Reichheld et al. 2000). It is especially true for e-commerce, where customers can switch from one marketplace to others at an almost zero switching cost. Customer relationship is thus an important topic. Moreover, the traditional business-customer interactions usually mediated by salespersons are now mediated by e-commerce websites maintained by service providers (the intermediary) (Evanschitzky et al. 2004; Meuter et al. 2000). In this new environment, attributes of e-commerce intermediaries (e.b., eBay), measured by information quality, system quality and service quality, are critical in that they have direct impacts on how people perceive and feel their relationships with the intermediaries behind the information systems,

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primarily websites (Parasuraman et al. 2000). The intermediary should use websites as well as associated information systems and services to keep high quality relationships with its customers and subsequently enhance the business profitability.

Despite its significant implications for e-commerce research and practices, what the intermediary can do to promote and maintain good relationships with e-commerce customers is understudied in IS and marketing research. Currently, IS researchers treat buyers or sellers in e-commerce more from a system user perspective. As a result, a lot of attention has been paid to user acceptance of e-commerce systems, mostly websites (e.g., Aladwani 2002; Chen et al. 2002; Devaraj et al. 2002; Gefen et al. 2003a; Gefen et al. 2003b; Lee et al. 2001; McKnight et al. 2002; Pavlou 2001). Acknowledging the importance of studying user technology acceptance, we argue that we should also take a customer perspective with a direct connection to business profitability. In the present study, we focus on relationships among three IS concepts: information quality, system quality, and service quality, and three marketing concepts: relationship quality, customer commitment, and retention, as depicted in the research model (Figure 1). Specifically, we argue the relationship quality is a key factor that connects IS factors and business profitability factors (i.e., commitment and retention) and should thus receive sufficient attention from online marketplace service providers.

As our first attempt, we focus on one type of e-business: online auction, and one type of customers: sellers, in light of the fact that existing e-commerce research has focused on buyers whilst sellers, albeit important for online auction, receive little attention. Not only buyers, and also sellers, are customers of online auction marketplaces and critical for online auction success. In light of the fact that there are more and more individuals selling things in online auction marketplaces<sup>2</sup>, studies from their perspectives are necessary. That is, we study how online auction intermediaries (e.g., eBay.com) achieve high quality relationships with sellers and enhance sellers' commitment and retention by focusing on the information, system and service factors.

The contributions of the current study are as follows. First, we take a customer perspective and investigated the impacts of the attributes of web-based service providers (the intermediary) on customer relationship, commitment, and retention. Relationship quality, to our best knowledge, has not been studied in IS research. Second, service quality has not received sufficient attention surprisingly (DeLone et al. 2004). This research provides a piece of empirical evidence that service quality is very important in e-commerce success given its high path efficient with relationship quality. Third, in this research, we revise the traditional definition of relationship quality by including affective trust as one component of relationship quality. We believe this revision contributes to the conceptualization of relationship quality in both IS and marketing literature. Fourth, we study this topic from a seller's perspective. Sellers are also the customers of online auction

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<sup>2</sup> 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](http://207.21.232.103/pdfs/PIP_SellingOnline_Nov05.pdf)

intermediaries and are critical for e-commerce success. To our best knowledge, there is little prior research conducted from this perspective.

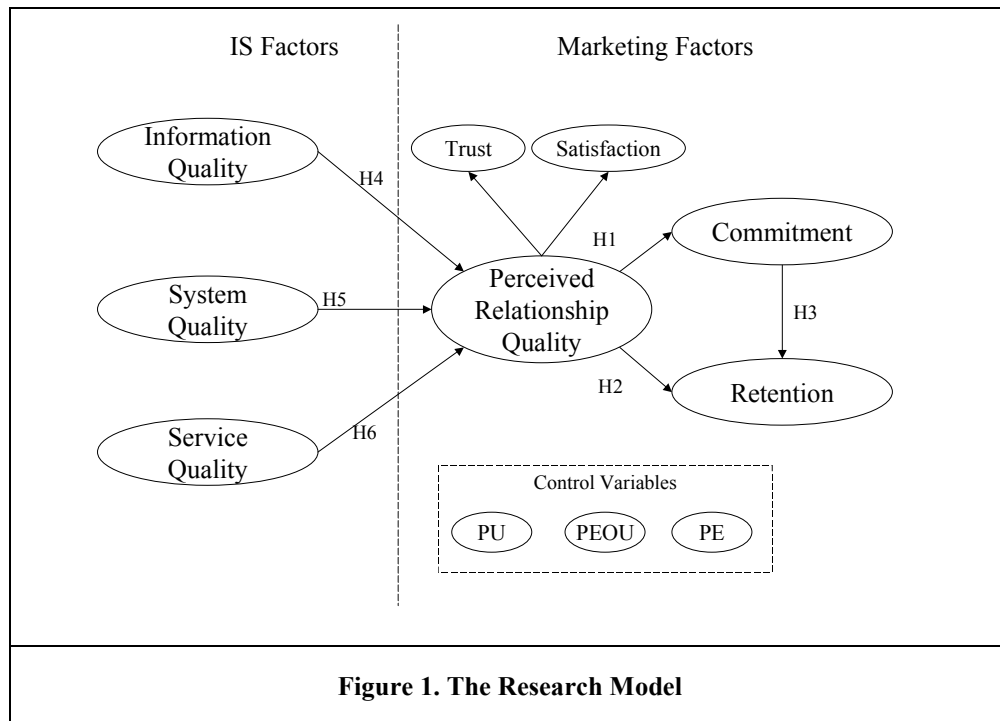


Figure 1. The Research Model

## Theoretical Development

### *Relationship quality*

Relationship marketing is a recently emerging paradigm and has attracted a lot of attention in marketing research (Crosby et al. 1990). 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). It is the quality of the relationship between the intermediary and its customers that determines the probability of continued interchange between those parties in the future. It has been pointed out that high quality relationship is especially important for conditions where customers face intangibility, uncertainties, lack of familiarity, and long time horizon of delivery (Crosby et al. 1990). These factors are very common for e-commerce business. Therefore, relationship quality is critical in e-commerce contexts.

Relationship quality is conceptualized as a composite or multidimensional construct capturing the different but related facets of a relationship (Palmatier et al. 2006). Researchers have traditionally conceived relationship quality as a high order construct although they differ in which components are included (Crosby et al. 1990; Kumar et al. 1995; Lages et al. 2005). In this research, we refer to the Crosby et al.'s work, in which relationship quality is a high order construct and has two distinct yet related components: trust and satisfaction (Crosby et al. 1990). These two components have been widely

referred to in following studies. Therefore, a high relationship quality indicates that the customer trusts the intermediary and has confidence in the intermediary's future performance because its past performance has been consistently satisfactory.

First, trust has been considered an important dimension of relationship quality. Only when a seller trusts the intermediary does he or she perceive there is a good relationship between the intermediary and him or her. We revise Crosby et al's conceptualization of relationship quality by including affective trust, in light of the fact that relationship quality is the feeling people have regarding their relationship with others instead of merely cognitive calculation which albeit important is insufficient (Komiak et al. 2006). Moreover, the other dimension of relationship quality, satisfaction, is also an affective concept. Therefore, affective trust, defined as a seller's subjective feeling that relying on this intermediary for conducting businesses is secure and comfortable, is appropriate and can capture the true meaning of the trust component of relationship quality.

Second, satisfaction with the relationship is defined as a positive emotional state resulting from the assessment of the intermediary's relationship with sellers. Previous IS research on satisfaction has focused on satisfaction with information systems, instead of the relationship per se. The satisfaction dimension of relationship quality is pertaining to *the relationship* with the intermediary, instead of the satisfaction with the intermediary itself.

### ***Consequences of relationship quality***

Relationship quality can have various consequences depending on which condition it is studied. For instance, in studying the relationship between IS departments and IS uses within organizations, Carr studied two consequences of relationship quality: identification with the IS department and voluntary participation with IS department (Carr 2006). In the current study, we are particularly interested in two consequences of relationship quality: customer commitment and retention given our interests in strategies of keeping sellers to an online marketplace, that is, to make sellers committed and subsequently be willing to return to the marketplace in the future.

First, defined as an enduring desire to maintain a valued relationship (Moorman et al. 1992; Palmatier et al. 2006), relationship commitment is the most common dependent variable used in buyer-seller relationship studies (Wilson et al. 1998). Relationship commitment has been conceptualized as a multiple dimension construct. For instance, Gundlach et al proposed three components of commitment: an instrument component of some forms of investment, an attitudinal component described as affective commitment or psychological attachment, and a temporal dimension indicating that the relationship exists over time (Garbarino et al. 1999; Gundlach et al. 1995). Commitment is an essential ingredient for successful long-term relationships (Dwyer et al. 1987). Committed sellers are the basis for business continuity and bring future value or benefits to the partners (Hardwick et al. 1986). Committed sellers feel loyal to the intermediary and are willing to put extra

efforts or sacrifice short-term benefits to maintain the relationship with it. It is especially important in e-commerce

considering the almost zero switching cost.

Relationship quality is expected to exhibit a positive influence on seller's relationship commitment. When a seller feels secure and satisfied with relying on the e-commerce service provider, he or she is more likely to be committed to the relationship. The significant impacts of relationship quality on commitment has also received empirical support (Moorman et al. 1992).

**H1: Perceived relationship quality is positively related to their commitment to the marketplace.**

It is also found that high relationship quality can enhance customer retention. Retention or future interaction is rooted in the perception of the current relationship. A seller who feels secure and satisfied with the current relationship is more likely to have intention to come back to the online marketplace again in future. In Crosby et al's research, relationship quality was found to be a significant antecedent of "anticipation of future interaction" (Crosby et al. 1990). In the same vein, Palmatier et al also found a significant relationship between relationship quality and continuity (Palmatier et al. 2006).

**H2: Perceived relationship quality is positively related to customer retention to the marketplace.**

By definition, relationship commitment has been proposed to be one of the primary drivers of customer retention (Gustafsson et al. 2005). Committed customers are more likely to maintain the relationship and return to the marketplace in the future. Actually, commitment has a temporal dimension indicating that the relationship exists over time, which is similar to the retention (Garbarino et al. 1999; Gundlach et al. 1995). Garbarino et al found that commitment was significantly related to future intention (Garbarino et al. 1999). In the same vein, commitment was confirmed to predict the continuity of the relationship (Palmatier et al. 2006). Park et al also confirmed that customers site commitment leads to purchase behavior (Park et al. 2003). Combined, we argue that:

**H3: Customer commitment to an online marketplace is positively related to retention.**

***Technological antecedents of relationship quality***

Marketing research does not usually consider the technological antecedents of relationship quality. In this research, we refer to DeLone and McLean's E-commerce Success Model (DeLone et al. 2004). Specifically, we refer to three factors to evaluate an e-commerce intermediary: information quality, system quality and service quality. Below are the descriptions of these three factors, largely from DeLone et al and Wixom and Todd's work (DeLone et al. 2004; Wixom et al. 2005).

- **Information quality** refers to the e-commerce content issues and covers the completeness, accuracy, format and currency aspects of information delivered by e-commerce marketplaces (Wixom et al. 2005).

- **System quality** measures the desired characteristics of an e-commerce system. It usually covers the reliability, flexibility, integration, accessibility, and timeliness of the e-commerce system.
- **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 et al. 2004). The service quality in e-commerce is different from the traditionally studied service quality in IS research, which has been focusing on the services in organizations (Balasubramanian et al. 2003; Bhattacharjee 2001a).

As mentioned earlier, the traditional human-to-human business interaction has been mediated by human-to-machine interaction (Parasuraman et al. 2000). Therefore, attributes of the e-commerce systems are likely to affect customers’ perception of their relationship with the business behind the systems just as a salesperson’s attributes have great effects on customer’s perceptions and attitudes towards the company the salesperson represents (Swan et al. 1985). In IS research, Pavlou et al confirmed explicitly that e-commerce website characteristics such as information security concerns and information privacy concerns influence users’ perception of the uncertainty of their relationship with online vendors (Pavlou et al. 2007). Therefore, it is reasonable to argue that sellers are likely to have high quality relationships with the online marketplace with high information and system qualities and good services.

**H4: Information quality is positively related to perceived relationship quality.**

**H5: System quality is positively related to perceived relationship quality.**

**H6: Service quality is positively related to sellers’ perceived relationship quality.**

### ***Control variables***

It is necessary to control for variable that may have potential influence on the depend variables in a research model, which provides a stronger test of the theory underlying that research model (Doney et al. 1997). Therefore, we identified three variables that have been found to significantly influence retention: perceived usefulness, perceived ease of use, and perceived enjoyment. Controlling for these factors can give us a better idea regarding the impacts of relationship quality and commitment on retention.

- Perceived usefulness (PU) is defined as “the degree to which a person believes that using a particular technology will enhance his performance” (Davis 1989 p.320). PU has been found to be a significant factor affecting users’ intention to use information systems (refer to Sun et al. 2006 for a review).

- Perceived ease of use (PEOU) is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis 1989 p.320). Prior studies has found the significant impacts of PEOU on (e.g., Agarwal et al. 2000; Davis et al. 1989; Van der Heijden 2004; Venkatesh et al. 2003)
- Perceived enjoyment (PE) is defined as the extent to which the activity of using an information system is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Davis et al. 1992). PE’s impacts on intention to use has been well studied (e.g., Agarwal et al. 2000; Igarria et al. 1996; Koufaris 2002; Teo et al. 1999; Van der Heijden 2004).

It is noteworthy that while these three control variables are in the traditional user technology acceptance literature and have been used widely to study individual’s intention to use of information systems, prior studies have confirmed that these variables can also been used in e-commerce research and can influence retention (e.g., Koufaris 2002).

## **Method**

Previously validated measures were used in this research. Measures for information quality and system quality were adapted from (Wixom et al. 2005). Affective trust were measured by three items adapted from (Komiak et al. 2006). Items for relationship satisfaction and commitment were adapted from (De Wulf et al. 2001). Measures for measuring perceived usefulness and perceived ease of use were originally developed by Davis (Davis 1989; Davis et al. 1989) and were adapted by Gefen for user acceptance of e-commerce (Gefen et al. 2003b). Three items for perceived enjoyment were adapted from (Van der Heijden 2004). Retention had two items adapted from (Koufaris 2002). Appendix A lists the instrument.

We did not use the SERVQUAL to measure service quality in that, as mentioned earlier, it has been argued that SERVQUAL is mainly for non-Internet-customers and thus not appropriate for e-commerce service (Parasuraman et al. 1988). SERVQUAL is appropriate when users are familiar with the service provider’s conditions such as their employees, hardware, software, and availability, among others, and thus not applicable for more web-based services such as e-commerce services considering their remote and anonymous nature (Bhattacharjee 2001b). Therefore, to measure service quality of the intermediary, we developed a two-item instrument similar to those for information quality and system quality in Wixom and Todd’s research (Wixom et al. 2005).

A survey was conducted at uBid.com, an online auction service provider. uBid.com sellers were recruited by a contact people at uBid.com. Totally, 176 usable responses were received. Then 36 unusable responses, which did not answer at least one of the three pages of the questionnaire, were dropped, resulting in a final set of 140 responses. Table 1 shows the demographic characteristics of the sample.

<b>Variables</b>	<b>Sample Composition</b>	
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 Future Bids within A Month	1-3	22%
	3-10	28%
	More than 10	50%

## Results

### *Measurement model*

PLS (PLS, version 03.00), a component-based SEM technique was used for data analysis. All constructs in the research model were modeled as reflective because their measurements were manifestations of the constructs (Barclay et al. 1995).

As we can see in Table 2, the composite reliabilities for all constructs are greater than 0.70 and therefore suggest sufficient reliabilities. The averages of variance explained (AVEs) are all greater than 0.50 and indicate 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), which indicate sufficient discriminant validities of the constructs. Appendix B also shows cross-loadings, indicating that all items load more on their own constructs other on other constructs.

<b>Constructs</b>	<b>CR</b>	<b>AVE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1. Intention to return	0.985	0.970	0.985					
2. Commitment	0.932	0.821	0.730	0.906				
3. Relationship Quality	0.786	0.655	0.548	0.621	0.809			
4. Information Quality	0.981	0.962	0.417	0.507	0.727	0.981		
5. System Quality	0.970	0.941	0.395	0.511	0.728	0.930	0.970	
6. Service Quality	0.969	0.939	0.418	0.506	0.792	0.817	0.876	0.969

CR: Composite Reliability; AVE: Average Variance Extracted.  
 Diagonal Elements 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. This condition is satisfied for each construct.

### **Structural model**

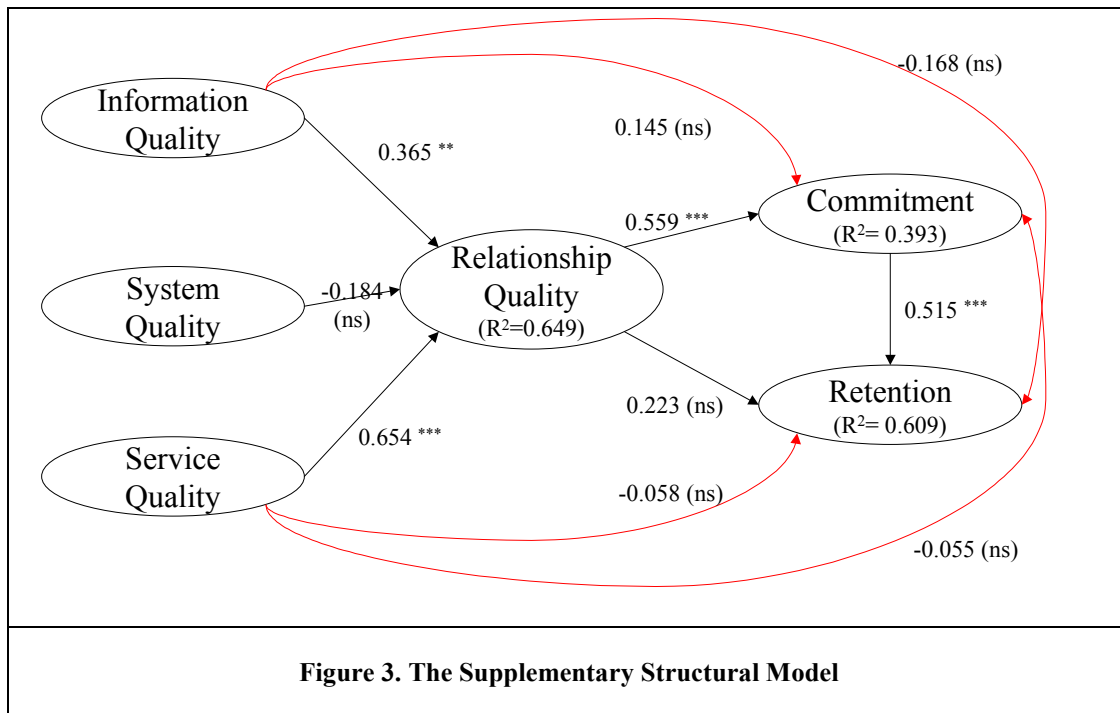
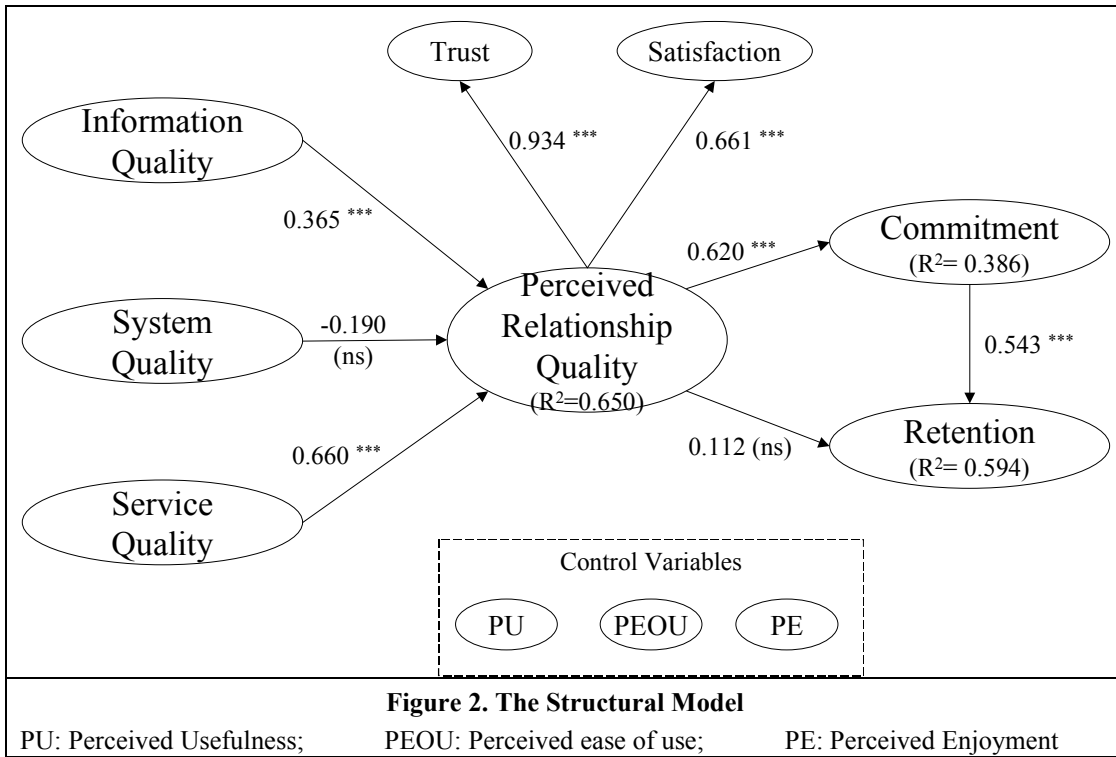
Figure 2 depicts the results of the structural model. Most of our hypotheses were confirmed except two (H2 and H5). For the consequences of relationship quality, we found a significant relationship between relationship quality and commitment (H1 confirmed). However, relationship quality does not have a significant impact on retention (H2 not confirmed). Commitment, on the other hand, affects retention significantly (H3 confirmed).

As for the antecedents of relationship quality, significant relationships between information quality and service quality and relationship quality were observed (H4 and H6 confirmed). However, the relationship between system quality and relationship quality was not significant (H5 not confirmed).

In general, the model explains a significant part of variances in sellers' intention to return ( $R^2=59.4\%$ ) and commitment ( $R^2=38.6\%$ ), indicating the robustness of the research model. Information and service qualities jointly explain 65% variance in relationship quality.

To further examine the mediating effects of relationship quality, we conducted a supplementary analysis with additional links between information and system qualities and commitment and retention. As we can see in Figure 3, the results confirmed the mediating effects of relationship quality; information quality and system quality do not have significant direct effects on commitment and retention over relationship quality.

As for control variables, only PEOU has a significant effect on intention to return and is thus controlled. Others do not have significant impacts on retention.



## **Discussions:**

This paper links explicitly IS factors of online auction marketplace measured by information quality, system quality, and service quality, and business profitability factors indicated by customer commitment and retention. We further argue that relationship quality mediates the impacts of IS factors on business profitability factors. Using a sample of online auction sellers at uBid.com, our study confirms the research model. Most hypotheses were confirmed and the model explains a significant part of the variances in customer retention, commitment, and relationship quality.

An interesting finding is that relationship quality does not influence customer retention directly. Instead, its impact on retention is fully mediated by sellers' commitments. That is, relationship quality influences retention only when it elicits sufficient customer commitment. It is actually very interesting given commitment is also a new concept in IS research. As a result, achieving customer commitment is critical for getting customers back to the marketplace in the future. Relationship quality can be used to achieve high customer commitment.

Suggested by our findings, we highlight the importance of service quality in e-commerce success. There is little if any research focusing on service quality in e-commerce (DeLone et al. 2004). As Pitt, Watson, and Kavan argued, "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 mismeasure IS effectiveness if they do not include in their assessment package a measure of IS service quality" (Pitt et al. 1995 p.173). Our results empirically demonstrated the importance of service quality in e-commerce. As we can see in above results, service quality turned out to be the most significant antecedent of relationship quality.

Information quality also has significant impacts on customers' perceived relationship quality but with a lower path coefficient than that of service quality. Providing complete, accurate, updated and well-formatted information is thus important for maintaining good relationships with customers. An interesting finding is that system quality does not influence relationship quality significantly. One possible explanation is that along with advances in information technology, system quality has been significantly enhanced and is not a major problem for e-commerce practices any more.

Findings from this research also have practical implications. First, commitment is very significant in influencing customer retention. Promoting customer commitment is thus important in e-commerce. Second, relationship quality is confirmed to be an important factor in promoting customer commitment and thus should received sufficient attention from practitioners. Third, providing high quality services and information is an effective way to maintain high quality relationship with customers. System quality, on other hand, does not contribute to customers' perceptions of their relationships with the marketplace. Practitioners should therefore focus on providing high quality services and information.

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<b>Appendix A: Measures</b>	
<b>Constructs</b>	<b>Manifest variables</b>
Information Quality	IQ1. Overall, I would give the information provided by uBid.com a high rating in terms of quality.
	IQ 2. In general, uBid.com provides me with high-quality information.
System Quality	SQ1. Overall, uBid.com is of high system quality.
	SQ2. Overall, I would give the system quality of uBid.com a high rating.
Service Quality	SVQ1. Overall, I would give the service from uBid.com high marks.
	SVQ2. In general, I would give the quality of uBid.com a high rating.
Relationship Quality _ Trust	RQ_T1. I feel secure about relying on uBid.com for my auctions.
	RQ_T2. I feel comfortable about relying on uBid.com for my auction.
	RQ_T3. I feel content about relying on uBid.com for my auction.
Relationship Quality _ Satisfaction	RQ_S1. As a uBid.com seller, I have a high-quality relationship with it.
	RQ_S2. I am happy with the efforts uBid.com is making towards sellers like me
	RQ_S 3. I am satisfied with the relationship I have with uBid.com.
Commitment	CMT1. I am willing to make efforts to remain a seller of uBid.com.
	CMT2. I fell loyal towards uBid.com.
	CMT3. Even if uBid.com would be more difficult to use, I would still keep selling there.
Retention	INT1. How likely is it that you will visit uBid.com again in the future?
	INT2. How likely is it that you will sell things again at uBid in the future?
Perceived Usefulness	PU1. uBid improves my performance in selling products.
	PU2. uBid enables me to sell products faster.
	PU3. uBid enhances my effectiveness in sales.
	PU4. uBid increases my productivity in sales.
Perceived Ease of Use	PEOU1. It is easy to become skillful at using uBid.
	PEOU2. Learning to use uBid is easy.
	PEOU3. uBid is flexible to interact with.
	PEOU4. uBid is clear and understandable.
Perceived Enjoyment	PE1. I find using uBid to be enjoyable.
	PE2. Using uBid is pleasant.
	PE3. I have fun using uBid.

Appendix B: Loadings and Cross-Loadings										
	Information Quality	System Quality	Service Quality	RQ (Trust)	RQ (Satisfaction)	Commitment	Retention	PU	PEOU	PE
IQ2	<b>0.906</b>	0.604	0.456	0.746	0.281	0.192	0.162	0.260	0.285	0.274
IQ3	<b>0.982</b>	0.674	0.497	0.739	0.276	0.191	0.152	0.264	0.320	0.290
SQ2	0.829	<b>0.893</b>	0.390	0.635	0.245	0.181	0.094	0.255	0.288	0.257
SQ3	0.876	<b>0.906</b>	0.418	0.681	0.274	0.164	0.123	0.241	0.275	0.264
SVQ1	0.640	0.394	<b>0.920</b>	0.674	0.478	0.417	0.208	0.226	0.271	0.254
SVQ3	0.723	0.402	<b>0.923</b>	0.778	0.505	0.424	0.220	0.277	0.289	0.296
RQ_Tr1	0.725	0.460	0.573	<b>0.957</b>	0.355	0.253	0.249	0.314	0.275	0.312
RQ_Tr2	0.754	0.470	0.564	<b>0.966</b>	0.361	0.254	0.260	0.319	0.305	0.323
RQ_Tr3	0.698	0.401	0.431	<b>0.829</b>	0.238	0.174	0.142	0.257	0.218	0.236
RQ_St1	0.431	0.302	0.519	0.505	<b>0.801</b>	0.751	0.662	0.660	0.674	0.665
RQ_St2	0.521	0.378	0.610	0.580	<b>0.838</b>	0.775	0.639	0.679	0.688	0.694
RQ_St3	0.529	0.394	0.626	0.618	<b>0.879</b>	0.801	0.676	0.740	0.730	0.744
Commitment1	0.334	0.287	0.555	0.426	0.856	<b>0.903</b>	0.766	0.711	0.732	0.726
Commitment2	0.353	0.237	0.432	0.343	0.704	<b>0.755</b>	0.571	0.565	0.585	0.600
Commitment3	0.253	0.047	0.398	0.289	0.610	<b>0.714</b>	0.557	0.510	0.541	0.514
INT1	0.242	0.104	0.306	0.335	0.737	0.750	<b>0.965</b>	0.808	0.843	0.815
INT2	0.393	0.174	0.342	0.475	0.645	0.656	<b>0.851</b>	0.705	0.735	0.700
PU1	0.548	0.416	0.407	0.575	0.664	0.595	0.654	<b>0.857</b>	0.770	0.778
PU2	0.434	0.321	0.328	0.498	0.634	0.610	0.683	<b>0.850</b>	0.771	0.775
PU3	0.513	0.391	0.352	0.548	0.638	0.581	0.629	<b>0.837</b>	0.747	0.756
PU4	0.424	0.194	0.365	0.550	0.635	0.568	0.648	<b>0.828</b>	0.713	0.742
PEOU1	0.467	0.328	0.337	0.411	0.660	0.625	0.761	0.773	<b>0.859</b>	0.790
PEOU2	0.485	0.328	0.403	0.449	0.677	0.666	0.747	0.748	<b>0.878</b>	0.794
PEOU3	0.528	0.381	0.359	0.490	0.631	0.594	0.650	0.742	<b>0.819</b>	0.801
PEOU4	0.576	0.403	0.442	0.513	0.713	0.660	0.732	0.826	<b>0.874</b>	0.840
PE1	0.534	0.363	0.407	0.533	0.673	0.638	0.690	0.800	0.831	<b>0.869</b>
PE2	0.504	0.350	0.382	0.551	0.711	0.673	0.717	0.808	0.817	<b>0.877</b>
PE3	0.473	0.278	0.354	0.486	0.637	0.588	0.664	0.753	0.779	<b>0.848</b>