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The Effects of Perceived Information Quality and Perceived System Quality on Trust and Adoption of Online Reputation Systems

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ABSTRACT

Online reputation systems are the means for reducing information asymmetry among the parties involved in an online transaction. When customers interact with a reputation system, they actually interact both with the system and with other customers who feed information into the system. Recognizing the dual nature of this interaction, this study examines the effects of perceived systems quality and perceived information quality on online customers' intention to adopt the online reputation system. The research model proposes that perceptions will affect the intention to adopt through both psychological routes (i.e. trust in customers feeding the reputation system) and functional routes (perceived usefulness of the reputation system). An online survey was conducted. The results show that users' perceived information quality and perceived system quality indeed significantly affect their intention to adopt the system, mainly through the functional route, but not significantly through the psychological route.

Keywords

Reputation Systems, Feedback system, trust, perceived information quality, perceived systems quality, adoption, perceived ease of use, perceived usefulness.

INTRODUCTION

In electronic commerce, there exists information asymmetry and numerous uncertainties between buyers and sellers. While sellers normally know who they are and what kinds of products they have, buyers normally do not know the sellers and do not know the exact features and quality of the products in an online transaction. Buyers have to build high levels of trust in the sellers and products before they conduct the transactions.

How can we decrease such information asymmetry and uncertainties thus to increase buyers' trust in e-commerce? The information provided to the buyers on a seller's or product's trustworthiness and reputation can dramatically reduce the inefficiencies caused by information asymmetry in such situations. In the physical business world, word-of-mouth exchanges within the buyer's community about their prior experiences with a particular seller or product use were found to be a very effective means to alleviate situational uncertainty for new buyers. In e-commerce, a growing trend exists among online sellers and service-providers to allow the buyer community to exchange comments about their buying experiences via the availability of online reputation systems (Resnick et al., 2000). Examples of online reputation systems include the customer review/feedback system at ebay.com, BizRate.com, Eopinions.com, Slashdot.com, and Amazon.com.

Reputation systems are meant to provide new buyers with the feedback comments of buyers who already experienced an online purchase with the particular seller or product involved (Jøsang et al., 2007). Prior research shows that reputation systems can contribute significantly in improving the probability of sale (Melnik & Alm, 2002), improving the product (or service) quality, and establishing a competitive environment for product and service price settlements (Resnick & Zeckhauser, 2001). Evidence gathered from ebay's feedback forum shows that sellers have serious concerns with the types of feedback logged into the system for public viewing and thus strive for the improvements (Resnick & Zeckhauser, 2001).

Reputation systems are different from word-of-mouth, because users interact with other customers through a web-based information technology. Therefore, when customers interact with a reputation system, they actually interact both with the system and with other customers who feed information into the system. Recognizing the dual nature of this interaction, this study examines the effects of perceived systems quality and perceived information quality on online customers' intention to adopt the online reputation system. Drawing from the theory of reasoned action (TRA) and Gefen, Karahanna, and Straub's (2003) integrated model, this paper proposes and tests the idea that these two perceptions will affect the intention to adopt

through both psychological routes (i.e. trust in customers feeding the reputation system) and functional routes (perceived usefulness and easy-of-use of the reputation system).

THEORETICAL FOUNDATIONS

The research model of the current study is built on the theory of Reasoned Action (TRA) and Gefen, Karahanna, and Straub's (2003) integrated model of trust and TAM (Technology Acceptance Model).

According to TRA (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975), a person's performance of a specified behavior is determined by his or her behavioral intention (BI) to perform the behavior, and BI is jointly determined by the person's attitude (A) and subjective norm (SN) concerning the behavior in question. The effect of SN is more applicable in environments where IT use is mandatory rather than where IT use is voluntary (Miller and Hartwick 2002), which is the case of the use of feedback reputation systems. Therefore, the research model in this study focuses on the perception-belief-attitude-intention path, and not the subjective norms.

In the context of online shopping, Gefen, Karahanna, and Straub (2003) propose an integrated model of trust and TAM in order to explain the customers' intention to adopt an e-vendor's website (i.e. shopping there). Their study examines customer trust as a primary reason for why customers return to an e-vendor. In the context of online shopping, the primary interface with an e-vendor is an IT, a Web site. Recognizing the dual nature of this interaction, their study suggests the intended use of a website is predicted by trust, perceived usefulness, and perceived easy-of-use. In their model, trust can be built via calculative-based trust, institutional-based structural assurance, institution-based situational normality, and knowledge-based familiarity; perceived ease-of-use is affected by institution-based situational normality and knowledge-based familiarity.

RESEARCH MODEL

Our research model (shown in Figure 1) proposes that the customers' perceptions of reputation system will affect the intention to adopt through both a psychological route (i.e. trust in customers feeding the reputation system) and a functional route (perceived usefulness of the reputation system). It is based on the perception-belief-intention framework as suggested by the TRA theory. This model suggests that two perceptions (perceived information quality and perceived system quality) will affect two beliefs (trusting belief and perceived usefulness belief), and that these two beliefs will affect the customers' intention to adopt the reputation system.

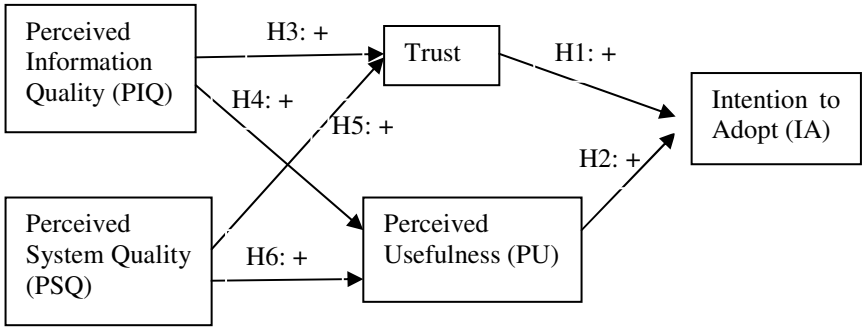

Figure 1: Research Model

Trust is at the heart of relationships of all kinds (Morgan and Hunt, 1994). In this study, trust is defined as an online customer's dependence on the reputation system for his or her decision on whether a potential product or seller is good or not. Trust is conceptualized as one construct – an overall trusting belief including trust in competence, integrity, and benevolence (Gefen et al. 2003, McKnight et al. 2002). Trust is important in situations where there is a state of dependence between two parties and when this dependence entails risk (Chopra and Wallace 2003). Trust reduces the complexity of understanding by subjectively ruling out the risk of undesirable, yet possible, future behaviors from the trustee (Gefen et al. 2003; Luhmann 1979). Thus trust is mainly a psychological route converting the customers' perception of the reputation system to their decision on whether to adopt the reputation system or not.

In the context of reputation system adoption, a customer will depend on the information provided by the reputation system for his or her decision making; however, risk arises because customers are aware that the information provided by the reputation system is of uncertain quality and that relying on poor information or poor reasoning on the part of the RA renders

them vulnerable to faulty decisions. Therefore, the adoption of reputation system will be affected by customers' trust. Prior research on trust suggests that higher level of trust will increase the user's intention to adopt an IT system (Gefen, et. al. 2003, McKnight et al. 2002, Komiak and Benbasat, 2006).

H1: Trust will affect the intention to adopt a reputation system.

Unlike the word-of-mouth in physical business settings, the customers who write the feedback information on products/sellers are not inseparable but complementary with the reputation system (an IT, a website). Therefore, when customers interact with a reputation system, they actually interact both with the system and with other customers who feed information into the system. Following Gefen et al.'s integrated model as an example, we recognize the dual nature of this interaction by incorporating the users' assessment of IT features as an additional set of explanatory variables in understanding why customers adopt and use the web-based reputation systems.

Based on the TAM model, our research model suggests that perceived IT features will affect customers' intention to adopt through perceive usefulness which is a functional assessment of the IT system. TAM (Davis et al., 1989) has been widely used by IS researchers for explaining technology adoption (Bahmanziari, 2003; Pavlou, 2003) in an organizational context. TAM (Davis et al., 1989) posits that two particular beliefs, perceived usefulness (PU) and perceived ease of use (PEOU), are of primary relevance for technology acceptance behaviors shown by technology users. This study focuses on PU because PU is at the center of users' judgment of IT functions. PU is more predictive than PEOU in a TAM model. Our model focuses on PU for the sake of simplicity. PU is defined as the prospective user's subjective probability that using the reputation system will increase the quality of his/her decision regarding the adoption of an online transaction. According to TAM,

H2: Perceived usefulness of reputation system will affect the users' intention to adopt it.

The online reputation system can be considered as a messenger, while the information delivered by the reputation system can be considered as the message provided by other online customers. This research model examines both Perceived Information Quality (PIQ) and Perceived System Quality (PSQ). PIQ reflects the quality of message, and PSQ mainly reflects the quality of messenger.

Existing literature in the area of information system success points out towards system characteristics which can affect the user-perception about the systems' quality. These characteristics include (1) information integrity (Boritz 2004), (2) data quality (Lee et al. 2002, Wang and Strong 1996), and (3) information quality (Bovee 2004).

Nicolaou and McKnight (2006) encompasses the above three dimensions stressing upon functioning-quality of an information systems in the construct, named as 'Perceived Information Quality' (PIQ). They defined PIQ as "cognitive beliefs about the favorable or unfavorable characteristics of the currency, accuracy, completeness, relevance, and reliability of the exchange information " (Nicolaou and McKnight 2006, p. 335)

Considering the direct effects of component dimensions for PIQ (Fung and Lee, 1999), PIQ can be considered as a direct antecedent for system related trust beliefs. Following the explanation given in Nicolaou and McKnight, (2006), following points elaborate upon the links between PIQ and system-related-trusts' beliefs:

- 'Information accuracy' is supposed to affect the integrity dimension of the trust-belief. This is because people trust a speakers' integrity who gives truthful or credible information (Giffin 1967)
- Information timeliness most likely affects the benevolence dimension of trust. This is because it implies that the trustee cares enough for the trustor interests to provide helpful information.
- Since PIQ reflect information that is accurate, reliable, and correct in detail, it implies that the source of information is competent. Considering the fact, PIQ should influence the competence dimension as well.

H3: Higher Perceived Information Quality (PIQ) will increase customers' trust.

It is reasonable to expect that a reputation system with higher PIQ will provides more useful information to support customer's decision making. This follows the definition of 'perceived usefulness' given by Davis (1989). The user of a reputation system is concerned with the optimality of his/her decision based upon the information he/she receives from the system. Higher PIQ of a reputation system implies a higher relevance and better quality of the information with the users' performance in his/her decision making, thus

H4: Higher Perceived Information Quality (PIQ) will increase perceived usefulness of reputation systems.

Earlier literature suggests that data security in online transactions is one of the main concerns of the participants (Suh and Han 2003). A user interacting with a reputation system always feels skeptical about the system-issues like authentication,

confidentiality, privacy, and data-integrity, unless he/she had developed some satisfactory perception level about the systems' competence in these areas. Suh and Han (2003) use a construct 'perceived strength of control'; they argue that higher levels of the construct results in stronger trust on an ecommerce website security infrastructure. The construct was presented as having five dimensions of authentication, non-repudiation, confidentiality, privacy protection, and data integrity.

In the context of online reputation system, user-interaction with a reputation system represents only a part of the full-picture of a complete ecommerce transaction, thus only two of the five dimensions included in construct seems applicable; authentication and data integrity. Therefore, current study uses Perceived System Quality (PSQ) as two dimensional construct, comprises of authentication and data-integrity only. Authentication ensures that the trading parties in an electronic transaction or communication are who they claim to be; Data integrity means that data in transmissions are not created, intercepted, modified, or deleted illicitly (Suh and Han, 2003). These requirements are accomplished by various technologies, such as encryption, third-party certificates, digital signatures, and compliance with privacy policy.

In the context of online reputation systems, authentication ensures that the system will accept feedback information only from identifiable or authorized consumers who actually took part in some transaction. Data integrity is essential for a secure and maliciously unalterable system database. It thus ensures that the information generated by the system is both reliable and credible.

User perception about system strength in maintaining the authentication and integrity features clearly influence the trust on systems' competence. A higher perception about system authentication and data integrity also implies the integrity and benevolence of the trustee (reputation system) towards the users' interest (getting quality feedback information). Therefore,

H5: Higher perceived system quality (PSQ) will increase customers' trust.

The dimensions included in PSQ construct are also expected to influence the perceived usefulness (PU) of the system. Following the logic of PU (Davis, 1989), a higher user perception in terms of authenticity and security of the feedback implies a higher users' confidence towards the usefulness of this feedback in improving the performance of the user in his/her decision making. Therefore,

H6: Higher perceived system quality (PSQ) will increase perceived usefulness (PU) of the reputation system.

RESEARCH METHODOLOGY

An online field survey was conducted to collect data in order to test the research model. The StudyResponse project, an academic service hosted by the School of Information Studies at Syracuse University, was hired to recruit subjects. About 2000 adults with online shopping experience were sent email participation requests. The email requests directed the potential subjects to an online survey set on www.surveymonkey.com. 520 potential subjects logged into the survey site. 191 subjects completed the survey. About two third subjects did not complete the survey mainly because the survey contained a component of field experimentation (see below for details). That component required extra time and effort from the subjects, but it was necessary for this study to make sure that the subjects actually experienced some online reputation systems. The motivation is a random draw of 20 gift certificates ($50 per certificate) to a popular online vendor such as Amazon.com.

The procedure of the survey is as follows.

- When a subject arrived at our survey website, he or she read an information sheet, and read and signed a consent form.
- The subject was instructed to interact with one online reputation system for products. Each subject went to either www.epinions.com or www.amazon.com, searched one product that he or she bought and used, and then wrote a review for this product. Then the same subject would search one or more products that he or she wanted to buy in the next six months, and read the product reviews, before he or she went back to our survey website.
- The subject was instructed to interact with one online reputation system for sellers. Each subject went to www.epinions.com or www.ebay.com or www.bizrate.com, read other customers' reviews about some unfamiliar sellers/e-stores, and wrote a review for a seller/e-store which the subject had experience with. Then the subject went back to our survey website.
- The subject answered some simple questions about which websites he or she went to, and which product/seller he or she reviewed.
- The subject completed a survey about the reputation system.

The survey contains measures for all the constructs in the research model. All constructs were measured using multi-item 7-point Likert scales. The measuring items are adopted from existing research. The measure of Perceived Information Quality is mainly adapted from Nicolaou and McKnight, (2006). The measure of Perceived System Quality is mainly adapted from Suh and Han (2003). The measure of trust is adapted from Gefen et al. (2003), Komiak and Benbasat (2006), and McKnight et al. (2002). The measures of Perceived Usefulness and Intention to Use are adapted from TAM model (Davis, 1989).

DATA ANALYSIS AND RESULTS

PLS Graph 3.0 was utilized to analyze the collected data due to its advantages of minimal demands on measures, sample size, and residual distributions (Chin et al. 1998).

The measurement model results show sufficient convergent validity and discriminant validity.

The structural model results (shown in Figure 2) show that the research model is largely supported by the collected data. Hypotheses 2, 3, 4, 5, and 6 are all supported, while hypothesis 1 was not supported. It is interesting to see that trust does not significantly affect the intention to adopt, which is inconsistent with prior research (Gefen, et al. 2003; Komiak and Benbasat, 2006). Further analysis shows that actually trust indeed significantly affects the intention to adopt, which is consistent with prior research; however, the effect of trust on the intention to adopt is fully mediated by the perceived usefulness of reputation system.

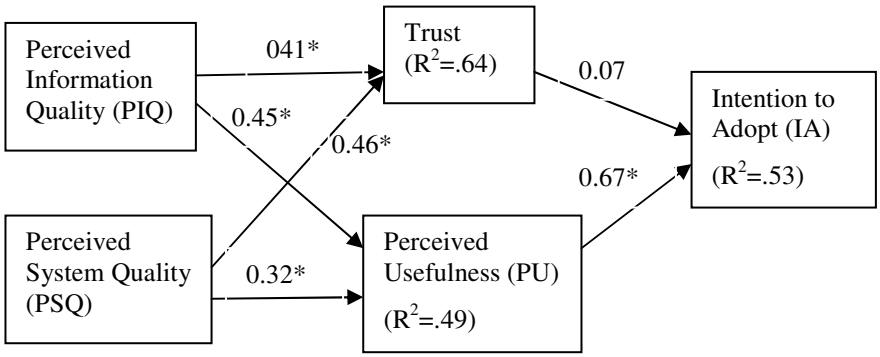

Figure 2: PLS Analysis Results – Structural Model

CONTRIBUTIONS AND CONCLUSIONS

This research examines how perceived information quality and perceived systems quality of an online reputation system affect customers' intention to adopt such a system. This study contributes to trust-in-e-commerce literature and to IT adoption literature.

This study contributes theoretically by proposing and testing the idea that IT features affect IT adoption intention through both the psychological route (trust) and functional route (assessing the perceived usefulness of the IT). The results show that the perceived reputation system's features indeed affect the customers' intention to adopt through both routes, although it seems that the effect of trust on the intention to adopt is fully mediated by the perceived usefulness.

This study contributes practically by showing that both perceived information quality and perceived system quality are important in the design and implementation of online reputation systems. The designers and owners of reputation systems may improve the system's perceived information quality by soliciting up-to-date and accurate feedback from customers. They may also improve the system's perceived system quality by making sure that only customers having conducted real business can write a product/seller/buyer feedback, and that the data integrity is protected in the reputation system.

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