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Yujong Hwang
DePaul University, yhwang1@depaul.edu

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Investigating the Effects of Perceived Web Quality on e-Trust, Mediated by Hedonic Needs and Anxiety

Yujong Hwang
School of Accountancy & MIS
College of Commerce
DePaul University
yhwang1@depaul.edu

ABSTRACT
Trust is the central dimension of e-commerce systems adoption, which is one of the most important aspects of e-CRM. In this paper, the effects of perceived Web quality on e-trust, mediated by website user’s anxiety and hedonic needs, are tested and discussed. E-trust is deconstructed into three dimensions (integrity, benevolence, and ability), and the complex relationships of e-trust dimensions with other technology adoption beliefs, including anxiety, enjoyment, and ease of use, are empirically tested with the initial data set (n=69). As expected, perceived Web quality negatively affects anxiety and positively influences enjoyment and ease of use, and anxiety negatively influences all of three dimensions of e-trust. However, enjoyment affects only integrity and benevolence dimensions of e-trust, whereas ease of use influences only ability dimension of e-trust. Furthermore, the effects of Web quality on e-trust are fully mediated by hedonic needs and anxiety. Theoretical and practical implications of these findings are discussed in the paper.

Keywords: e-trust, e-commerce, CRM, Web quality, anxiety, hedonic needs, TAM, Flow theory.

INTRODUCTION
Trust is the central dimension of e-commerce systems adoption, which is one of the most important aspects of e-commerce customer relationship management (e-CRM) (Gefen et al., 2003; Saeed et al., 2003c). Given that retailers’ online sales for the 2004 holiday season has increased 25% from the previous year, reaching 23.2 billion dollars (CNN Money, 2004), e-CRM and e-commerce trust should be investigated further as the strategic mechanism not only for the pure online companies but also for the hybrids (Saeed et al., 2003a). Even though there are a lot of research endeavors to explain e-commerce trust mechanism, such as the relationships of trust with the main antecedents and technology acceptance variables (Gefen et al., 2003), assurance mechanism (Grazioli and Jarvenpaa, 2000; Pennington et al., 2004), size and reputation (Jarvenpaa et al., 2000), transaction risk (Ba and Pavlou, 2002; Gefen, 2002a; Pavlou, 2003), social presence and network (Gefen and Straub, 2004; Kim and Prabhakar, 2002), cross-cultural investigation (Jarvenpaa et al., 1999), and willingness to purchase (Bhattacherjee, 2002; Gefen, 2002b), one of the main questions in building e-trust is how to build and design the website to enhance the beliefs of trust of a potential online customer (Pennington et al., 2004). Although the influence of website’s structural assurance and situational normality on system trust was supported by the previous studies (Gefen et al., 2003; Pennington et al., 2004), how this relationship is developed based on the website user’s perception of the system is a missing block of our knowledge.

As Gefen et al. (2003) argued, an e-commerce consumer is a company’s customer as well as website system user. Thus, there should be the system user’s perspective in building e-trust via website function and assurance mechanism. Another possible explanation of the role of a system user’s perspective is the self-service mechanism (Meuter et al., 2000; Rust and Kannan, 2003). Parasuraman (1996) argued the growing importance of self-service as a fundamental shift in the nature of service. Self-service technologies, such as an e-commerce website, are an example of a marketplace in which no interpersonal contact is required between buyer and seller. It is likely that the technological aspect of many recent self-service options has a unique effect on consumer perceptions of these self-service encounters (Meuter et al., 2000). Dabholkar (1996) found that enjoyment and control are the most influential attributes to the evaluations of self-service technologies. Meuter et al. (2000) also found that some customers perceive frontline employees as a nuisance to be avoided, leading to less loyalty and trust, increasing
switching behavior. Meuter et al. (2000, p. 59) argued, “self-service technologies may provide a way for customers to avoid this declining service and produce and consume on their own, at their own convenience”, emphasizing on the technology interface design to support this convenience. The interpretation of website function and e-trust based on self-service logic is a very interesting approach, because the absence of human contact has been interpreted only as the negative aspect of e-commerce, such as risk perception in the previous IS studies (e.g., Ba and Pavlou, 2002; Gefen, 2002a), rather than as the positive aspect. Based on self-service logic, a website can influence the positive side of consumer’s perception via enjoyment and increased control (Rust and Kannan, 2003). Thus, this research-in-progress paper investigates the potential linkages between the website mechanism and e-trust via positive and negative mediators of systems use beliefs, such as enjoyment, ease of use, and anxiety, based on the previous literature in information systems, marketing, and psychology.

RESEARCH MODEL AND HYPOTHESES

Figure 1 presents the proposed research model. Gefen (2002b) provided a multi-dimensional construct combining specific beliefs of e-trust: integrity, benevolence, and reliability. Integrity is the belief that the trusted party adheres to accepted rules of conduct, such as honesty and keeping promises (Mayer and Davis, 1999). Benevolence is the belief that the trusted party, aside from wanting to make a legitimate profit, wants to do good to the customer. Ability is the belief about the skills and competence of the trusted party. Gefen (2002b) developed and validated these three dimensions of e-trust, and Gefen and Straub (2004) recently found that social presence has positive effects on integrity (β = .21, p < .01) and benevolence (β = .41, p < .01), but not on ability. Gefen (2002b) also found that beliefs about the vendor’s integrity and benevolence affect overall trust and purchase intentions, while beliefs about the ability of vendor directly affect window-shopping intentions. These findings reinforce that e-trust is a multi-dimensional construct and that further investigation among the other variables in system adoption and multi-dimensional e-trust is meaningful. Thus, this study includes the perceived Web quality, system anxiety, enjoyment, and ease of use as the antecedents of multi-dimensional e-trust, and investigates these complex relationships.

Figure 1. Proposed Research Model

Perceived Web Quality

Gefen et al. (2003) explained that institution-based trust antecedents, such as structural assurances and situational normality, are the most powerful antecedents to e-trust. Structural assurance is an assessment of success due to safety nets such as legal resource, guarantees, and regulations that exist in a specific context (McKnight et al., 1998), and situational normality is an assessment that the transaction will be a success, based on how normal or customary the situation appears to be (Baier, 1986). Using a uni-dimensional e-trust, Gefen et al. (2003) found that the effects of structural assurance (β = .37, p < .05) and situational normality (β = .33, p < .01) on e-trust are higher than the other antecedents, such as calculative and knowledge
based antecedents. The situational normality also has an indirect effect on e-trust via ease of use. McKnight et al. (2002) found that perceived website quality positively influences the second order construct of trust beliefs (β = .78, p < .001). Pennington et al. (2004) also found that structural assurance with self-reported vendor guarantees affect system trust (β = .31, p < .05), while the other mechanisms, such as the third party seals and customer ratings, showed insignificant relationship with trust. Thus, self-reported vendor guarantees and situational normality are the target characteristics of website quality in this study.

Aladwani and Palvia (2002) provided user-perceived Web quality measures based on the scale development study. They defined perceived Web quality as the users’ evaluation of a website’s features meeting users’ needs, reflecting overall excellence of the website. Based on the exploratory factor analysis, they provided four dimensions of perceived Web quality: technical adequacy, content quality, specific content, and perceived quality. In these four dimensions, specific content shows the structural assurance (e.g., contact information and customer policy) and situational normality (e.g., one can easily find firm’s general information in the website). Self-service technologies, such as a website, can positively influence a consumer’s perception via enjoyment and increased control (Dabholkar, 1996; Rust and Kannan, 2003; Saeed et al., 2003b). Swan and Rosenbaum (2004) found that there are features of a website’s interface that play a role in the social construction of trust as people explore a website. In applying flow theory and the technology acceptance model (TAM), Koufaris (2002) found that website factors affect the consumer’s emotional responses, such as shopping enjoyment. The perceived Web quality of a specific content will positively influence enjoyment and ease of use, but negatively influence system anxiety. Thus, we hypothesize that:

- **H1**: Perceived Web Quality will have a positive effect on Perceived Enjoyment.
- **H2**: Perceived Web Quality will have a positive effect on Perceived Ease of Use.
- **H3**: Perceived Web Quality will have a negative effect on System Anxiety.

### Hedonic Needs and Anxiety

Der Heijden (2004) argued that hedonic information systems (IS), such as a website on the WWW, aiming to provide self-fulfilling rather than instrumental value to the user, are strongly connected to home activities. Hedonic IS focus on the fun-aspect of using IS, and encourage prolonged rather than productive use. Der Heijden (2004) showed that perceived enjoyment and perceived ease of use are stronger determinants of intentions to use than perceived usefulness in hedonic IS adoption. Enjoyment refers to the extent to which the activity of using a computer system is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology (Davis et al., 1992; Yi and Hwang, 2003). In explaining flow and cognitive absorption, Agarwal and Karahanna (2000) explained that dimensions of flow with intrinsic motivation include a sense of being in control and a loss of self-consciousness, which can be related to integrity and benevolence dimensions of e-trust. Gefen and Straub’s (2004) finding, that social presence has effects only on integrity and benevolence, not on ability, suggests that perceived hedonic and social needs of consumer, measured by perceived enjoyment, influence only on these two dimensions of e-trust. Gefen’s finding (2002b), that only the beliefs about integrity and benevolence affect overall trust, while ability belief directly influence window-shopping intention, also suggests these hypotheses. Koufaris (2002) argued that rather than using a multidimensional flow construct, simple construct like enjoyment explain online consumers behavior better. Thus, this study hypothesizes that:

- **H4-1**: Perceived Enjoyment will have a positive effect on Integrity in e-Trust.
- **H4-2**: Perceived Enjoyment will have a positive effect on Benevolence in e-Trust.

Perceived ease of use is an indicator of the cognitive effort needed to learn and to utilize the new IT (Davis et al., 1989). Ease of use perception is mainly based on the cognitive effort the user needs to invest to utilize the system (Gefen et al., 2003). If the user perceives the system easy to use, affected by situational normality and structural assurance of website, it will positively affect the perception of e-trust in that the vendor can reduce the cognitive load of user by vendor’s ability. Thus, the perception of little cognitive effort will be related to the perception that the vendor be able to support these needs mainly by its ability dimension of the e-trust relationship. Although there are several studies that support the relationship between ease of use and uni-dimensional e-trust (e.g., Pavlou, 2003; Gefen et al., 2003), the direct relationship to the specific dimension of e-trust was not tested. This study hypothesizes that:

- **H5**: Perceived Ease of Use will have a positive effect on Ability in e-Trust.
System anxiety is the apprehension or fear that results when an individual is faced with the possibility of using IS (Hackbarth et al., 2003). Social cognitive theory (Bandura, 1986) suggests that this emotional arousal is a negative mechanism that can impede performance. There are several studies on self-service technologies, suggesting that negative attitudes toward technology may negatively influence the extent to which consumers interact with technology-based services and products (Parasuraman, 1998; Raub, 1981). Negative attitudes, such as system anxiety, will negatively affect e-trust mechanism. Hackbarth et al. (2003) found that these negative effects of anxiety on ease of use and system perception are stronger and wider than the positive effects by hedonic needs. Thus, we hypothesize that;

H6-1: System Anxiety will have a negative effect on Integrity in e-Trust.
H6-2: System Anxiety will have a negative effect on Benevolence in e-Trust.
H6-3: System Anxiety will have a negative effect on Ability in e-Trust.

Hackbarth et al. (2003) found that both hedonic needs (playfulness) and computer anxiety are significant mediators of the effect that system experience has on ease of use. Institution-based e-trust antecedents, such as perceived Web quality, will influence ease of use, and these effects will be mediated by hedonic needs (positively) and system anxiety (negatively). Thus, this study hypothesizes that;

H7: Perceived Enjoyment will have a positive effect on Perceived Ease of Use.
H8: System Anxiety will have a negative effect on Perceived Ease of Use.

METHOD
All of the measurement items are adopted from the previous research on e-trust, TAM, motivational beliefs, and Web quality, as we explained in the hypotheses part (the detailed items and instruments will be presented in the conference, given the limitation of page length for proceedings). The free experiment with undergraduate business students in the Northern region of the U.S. was implemented with sixty-nine students who voluntarily participated in the experiment. The free experiment was conducted in an Internet classroom as suggested by Gefen (2002b). The students were asked to navigate to www.amazon.com, and go through the procedure of purchasing a book without actually submitting the purchase transaction. Next, the students were asked to complete the experimental instrument of an online survey based on their experiences with the website.

ANALYSIS AND RESULTS
The proposed model and hypothesis testing was conducted using PLS (Partial Least Squares) Version 3.0. Table 1 shows the internal consistency reliabilities and correlations among constructs. As recommended, the internal consistency reliabilities were all higher than .7 without exception, and the diagonal elements (square root of the variance shared between the constructs and their measures) were all higher than .707 and also higher than correlations between target constructs and other constructs without exception.

Figure 2 provides the results of hypothesis testing. As recommended (Chin, 1998), bootstrapping (with 500 subsamples) was performed to test the statistical significance of each path coefficient using t-tests. The model explained substantial variance in ease of use (R² = .50), ability (R² = .33), and integrity (R² = .30), and modest variance in enjoyment (R² = .15), benevolence (R² = .19), and anxiety (R² = .05). All of hypotheses are supported by the data analysis of PLS, except for the marginal relationship between Web quality and anxiety. An important empirical point in this study is whether three system-related beliefs, enjoyment, ease of use, and anxiety, fully mediate the relationship between perceived Web quality and multi-dimensional e-trust. Based on further analysis, perceived Web quality showed direct influence on all of three dimensions of e-trust, and these effects became insignificant after adding the three system-related beliefs, showing the full mediation effects.

<table>
<thead>
<tr>
<th>Construct</th>
<th>ICR</th>
<th>Web Quality</th>
<th>Trust Integrity</th>
<th>Trust Benevolence</th>
<th>Trust Ability</th>
<th>Anxiety</th>
<th>Ease of Use</th>
<th>Enjoyment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Quality</td>
<td>.82</td>
<td>.70</td>
<td>.87</td>
<td>.86</td>
<td>.89</td>
<td>.83</td>
<td>.88</td>
<td>.92</td>
</tr>
<tr>
<td>Trust_Integrity</td>
<td>.91</td>
<td>.32</td>
<td>.66</td>
<td>.53</td>
<td>.89</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust_Benevolence</td>
<td>.90</td>
<td>.23</td>
<td>.52</td>
<td>.53</td>
<td>.89</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust_Ability</td>
<td>.92</td>
<td>.25</td>
<td>.39</td>
<td>.35</td>
<td>.46</td>
<td>.43</td>
<td>.48</td>
<td>.92</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.89</td>
<td>-.21</td>
<td>-.39</td>
<td>-.35</td>
<td>-.46</td>
<td>.49</td>
<td>.49</td>
<td>.92</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>.93</td>
<td>.58</td>
<td>.37</td>
<td>.28</td>
<td>.52</td>
<td>-.43</td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>.94</td>
<td>.39</td>
<td>.44</td>
<td>.32</td>
<td>.34</td>
<td>-.16</td>
<td>.49</td>
<td>.92</td>
</tr>
</tbody>
</table>
**Note.** ICR = Internal Consistency Reliability. All the constructs are on a scale of 1 (negative) to 5 (positive).

**CONCLUSION**

The result of the study points out the mediating effects of hedonic needs and anxiety in the relationship between Web quality and multi-dimensional e-trust. Research on e-trust is an important issue to practitioners, such as website designers, as well as researchers. One of possible implications for website designers would be the guidance that enhancing enjoyable experience as well as reducing anxiety of website functions should be emphasized to increase e-trust. The result of this study supports the current research findings regarding hedonic needs (e.g., der Heijden, 2004) of self-service systems adoption and shows the new linkage between hedonic needs and trust dimensions. Future research can include the additional antecedents of enjoyment and anxiety, such as social or cultural factors, in the model to make our understanding complete. The overall hypotheses in this study are supported by the preliminary data set (n=69). The final data analysis using full data set (targeting more than 300), cross-loadings of dimensions, and the survey instrument will be presented in the conference. The final model would be valuable to e-commerce designers and researchers, who hope to understand and enhance e-trust mechanism in e-CRM environment.

**REFERENCES**