



The effect of trust in system reliability on the intention to adopt online accounting systems

The effect of
trust in system
reliability

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Abstract

Purpose – The purpose of this study is to examine whether the three principles in the SysTrust[®] service converge on a single construct to measure potential users' trust in the reliability of a system, and whether trust in the reliability of a system, as defined by the three SysTrust principles, affects potential users' intent to use the system.

Design/methodology/approach – In this study, the authors provide potential users with hands-on experience with the online accounting system offered by Oracle Small Business Suites[®]. The authors subsequently assess their perception of the extent to which the system meets the three SysTrust principles, and their intent to use the system.

Findings – The results show that potential users' perceptions of the three SysTrust principles converge on one factor, suggesting that they are indicative of the trust in system reliability as proposed by the AICPA and CICA. Moreover, the study shows that trust in system reliability, as defined by the three SysTrust principles, influences potential users' intent to adopt an online system.

Originality/value – This study is the only one to provide evidence that the SysTrust principles provide a valid means to holistically assess system reliability as needed by potential users of a system. This study also extends the Technology Acceptance Model (TAM) by including two unique trust components in the examination of online behaviors. The extended TAM shows that potential users' trust in system reliability and their trust in the internet interactively influence the intentions of these users to adopt online systems.

Keywords SysTrust[®], Online accounting systems, Technology acceptance model, Trust, Consumer behaviour, Accounting

Paper type Research paper

1. Introduction

Heavy reliance of today's businesses on the use of information technology makes the reliability of information systems very critical. To provide assurance regarding the reliability of a firm's system, the American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA) developed a type of assurance service known as SysTrust[1]. In a SysTrust engagement, a licensed CPA evaluates the reliability of a system based on a set of established principles and criteria. If a system satisfactorily meets the principles and criteria, the CPA issues an unqualified



SysTrust opinion attesting to the reliability of the system. By reporting on the system's reliability, SysTrust aims to establish users' trust in the system of a third party such as a business partner or an application service provider. To date, although the AICPA/CICA has continuously promoted the service, the actual demand for the SysTrust service has been limited (Sutton, 2006). Moreover, research in this area has also been limited. As a result, there has been a call for research to examine the issues that influence the demand for the SysTrust service (Bedard *et al.*, 2005; Sutton, 2006; Sutton and Hampton, 2003).

In response to the call, the present study examines two issues. First, it examines whether the SysTrust principles represent a single construct that measures potential users' perceptions of the reliability of a system. Reliability of a system is difficult to assess (Sutton and Hampton, 2003; Havelka *et al.*, 1998). Thus, it is critical to understand whether potential users perceive a reliable system to be the one that meets the principles of security, availability and processing integrity as intended by the AICPA/CICA. If the principles represent different constructs, it will be important to determine the relative significance of each one to a system's users. This may enable more effective marketing of the SysTrust services. On the other hand, convergence on a single factor will provide evidence that the principles provide a valid means to holistically assess system reliability as needed by potential users of the system.

Second, this study examines the extent to which trust in the reliability of a system, as defined by the SysTrust principles, affects potential users' intent to use the system. According to the AICPA and CICA, SysTrust is designed to enhance the confidence of a broad audience (management, board of directors, customers, business partners) regarding the reliability of information systems (AICPA/CICA, 2006; Bedard *et al.*, 2005; Pugliese and Halse, 2000). Prior research (Boritz and Hunton, 2002) has found that system reliability assurance influences managers' likelihood of recommending a contractual agreement with a service provider and their comfort level with the reliability of the service provider's system. Different from prior research, the present study examines whether trust in the reliability of an application service provider's system affects the intent of potential users (e.g. customers, business partners) to adopt and use its online application. Such an examination can provide insights into the relevance of the SysTrust principles to potential users of information systems. These insights can in turn help both application service providers (e.g. Oracle Small Business Suites and Peachtree, Inc.) and assurance providers (e.g. CPAs and CAs) to better serve their customers.

The remainder of this paper is organized as follows. The next section describes the background and the theoretical model for the study. Hypotheses are then developed followed by a description of the research method. Subsequently, the results are presented, and the implications of the findings are discussed.

2. Background and theoretical model

2.1 SysTrust service

The AICPA and CICA developed the SysTrust service in 1999 in anticipation of increased need for reliable systems that results from the heavy dependence on information technology. SysTrust is a type of assurance service performed by a licensed CPA or CA to independently test an organization's system and to offer assurance on the system's reliability. The intent is to enable those who use or rely on the system including the company itself, its partners and customers, to gain trust and confidence in the system (AICPA/CICA, 2006; Bedard *et al.*, 2005; Pugliese and Halse, 2000).

The extent to which the advantages of online accounting systems are obtained clearly depends on the reliability of the online systems of the service provider. Moreover, since users' concern about the online systems depends on the type of transactions (Greenberg and Wong-On-Wing, 2002), users may be more concerned about the reliability of an accounting system because of the nature of accounting transactions. In sum, the present study examines the effect of potential users' trust in the reliability of an online accounting service provider's system on their intention to adopt the system.

2.3 Theoretical model

According to Gefen *et al.* (2003b) and others (see a recent review by Wu *et al.* (2011)), users' intention to adopt an online system depends on their acceptance and trust of the system. Users' acceptance of information systems has been widely studied based on the technology acceptance model (TAM) (Davis, 1989). According to the model, perceived usefulness and perceived ease of use are the two major determinants of users' intent to adopt a system. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort. Since it was first introduced and tested, TAM has been established as a robust, powerful and parsimonious model for predicting user acceptance of technology (Venkatesh and Davis, 2000).

Prior research (Bhattacharjee, 2002; Gefen *et al.*, 2003a, b; McKnight *et al.*, 2002; Shneiderman, 2000; Hoffman *et al.*, 1999) also suggests that trust determines users' intention to adopt a system. That is, the more trust potential users have in the system of a specific provider, the more likely it is for these users to adopt the system (Gefen *et al.*, 2003a, b). When the system operates online, trust also involves specific beliefs about internet – the institutional environment (McKnight *et al.*, 2002). The distinction between the two types of trust is important in the present study because the SysTrust is intended to provide assurance about the system of a specific provider but not the internet. Specifically, we expect that a system that satisfies the SysTrust principles should be viewed as being more reliable and thus be trusted more than one that does not. In other words, trust in the system of a specific provider is influenced by the extent to which the system meets the SysTrust principles. It is referred to as trust in system reliability in the present study. Trust in the internet is also very important because individuals may trust the system of a specific provider, but not the internet, or vice versa. Individuals may not trust the internet because they perceive a lack of legal or technological protection on the internet. Consequently, they may not engage in online transactions.

In summary, based on prior research (Davis, 1989; Gefen *et al.*, 2003b; Wu *et al.*, 2011), we posit that perceived usefulness, perceived ease of use and trust are major determinants of users' intent to adopt an online system. These postulates are summarized in the extended technology acceptance model (ETAM) (Figure 1). It is worthy to note that the ETAM in the present study differs from and contributes to other integrated models of TAM and trust (Gefen *et al.*, 2003b; Wu *et al.*, 2011), in that:

- we include two types of trust in the model (trust in system reliability and trust in the internet), and examine their individual and interactive effects; and
- we measure potential users' trust in system reliability based on the three SysTrust principles.

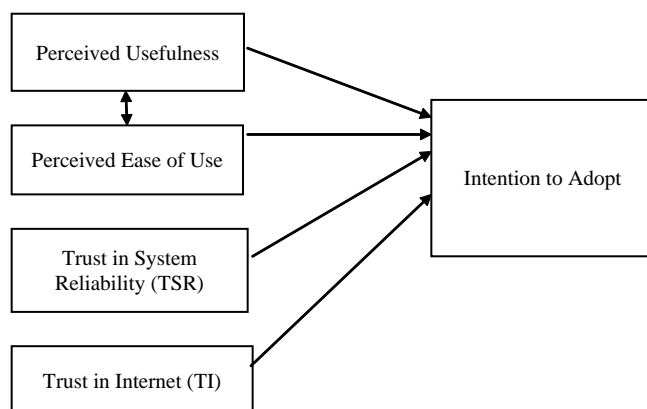


Figure 1.
Extended technology acceptance model

3. Hypotheses

Based on the ETAM in Figure 1, perceived usefulness and perceived ease of use of an online accounting system are expected to be positively associated with potential users' intent to adopt the system. With respect to the trust components, in addition to the individual main effects, an interaction effect between trust in system reliability and trust in the internet on potential users' intent to adopt the system is expected. Specifically, it is predicted that trust in system reliability will have a more significant effect on users' intent to adopt an online system when trust in the internet is low than when trust in the internet is high:

- H1.* Perceived usefulness is positively and significantly associated with potential users' intent to adopt an online accounting system.
- H2.* Perceived ease of use is positively and significantly associated with potential users' intent to adopt an online accounting system.
- H3.* Trust in system reliability is positively and significantly associated with potential users' intent to adopt an online accounting system.
- H4.* Trust in the internet is positively and significantly associated with potential users' intent to adopt an online accounting system.
- H5.* Trust in system reliability will have a more significant effect on users' intent to adopt an online accounting system when trust in the internet is low than when trust in the internet is high.

4. Method

4.1 Participants

This study recruited 54 graduating senior students enrolled in an accounting information systems (AIS) course. These students acted as proxy for entry-level accountants in small to medium size businesses. All of them were familiar with both manual and computerized accounting systems used in businesses. They had, however, no experience with online accounting systems prior to the study.

4.2 Procedures

As part of the AIS course requirement, participants were asked to complete a three-part project involving the use of the online accounting system of Oracle Small Business Suite (OSBS). In the first part, participants were instructed to study the specific features of the online accounting system, and to write a short paper regarding the advantages and disadvantages of such a system. They then registered to test drive the OSBS online accounting system and obtained hands-on experience by completing several transactions. This second part of the project also required participants to print the related documents such as the sales invoices, and to generate the financial statements. For the third part, participants wrote a short paper to describe their experience with OSBS. After turning in the requirements for all three parts of the project, participants each filled out a questionnaire that measured their trust of the internet, their trust in the reliability of the OSBS online system, their perceptions of the usefulness and ease of use of the system, and their intent to adopt the system.

4.3 Measures

Perceived usefulness, perceived ease of use and participants' intent to adopt the system were measured for the OSBS online system using the scales from Davis (1989) (see the Appendix). The scales have been used in subsequent applications of TAM (Venkatesh and Davis, 2000). Specifically, perceived usefulness and ease of use were each measured using four items. Participants' behavioral intention was measured by two items. Participants indicated their agreement with each item using a seven-point, Likert-type scale labeled from 1 "strongly disagree" to 7 "strongly agree". Higher (lower) perceived usefulness, ease of use and intention to adopt the system corresponded with higher (lower) scores.

The three SysTrust principles were used to measure trust in the reliability of the OSBS online system. These were the security, availability and processing integrity principles described earlier. Participants indicated the extent to which they trusted that the OSBS satisfied each principle. Their responses were recorded using a seven-point, Likert-type scale labeled from 1 "strongly disagree" to 7 "strongly agree", such that higher (lower) trust in system reliability corresponded with higher (lower) scores. In order to avoid biasing the participants' assessment, this study did not provide the seal of SysTrust or mention the SysTrust anywhere in the project or questionnaire. This is in contrast to research that examines the effect of the SysTrust seal (Runyan *et al.*, 2008).

Trust in the internet was measured via six items, taken from McKnight *et al.* (2002). Participants indicated their agreement with each item using a seven-point, Likert-type scale labeled from 1 "strongly disagree" to 7 "strongly agree", such that higher (lower) trust in the internet corresponded with higher (lower) scores.

5. Results

5.1 Descriptive statistics

Table I presents descriptive statistics for the measured variables with the reliability of each scale. All measurement scales showed acceptable or high reliability with Cronbach's α exceeding 0.78 (Nunnally, 1978).

5.2 Convergent validity of the SysTrust principles

To examine the extent to which the three SysTrust principles converged on a single construct, the three items for the trust in system reliability scale were subjected to

a factor analysis using principal component analysis. All three items loaded on a single factor accounting for 71 percent of the variability in the trust in system reliability score. Factor loadings for the three items ranged from 0.70 to 0.92, indicating convergence and a strong relationship between the items and the underlying factor. Overall, the results suggest that potential users perceive the three principles to measure one single underlying construct as the AICPA/CICA intended.

5.3 Validity of other measures in the extended TAM

Additional analyses were performed to assess the validity of other ETAM measures. Using principal component analysis, the four items that measured perceived usefulness of the system loaded on a single factor accounting for 83 percent of the variability. Factor loadings for the four items range from 0.90 to 0.92, indicating convergence and a strong relationship between the items and the underlying construct as well. Thus, we averaged participants' responses to the four items to form the measure of perceived usefulness (PU).

Similarly, the four items that measured perceived ease of use of the system loaded on a single factor accounting for 82 percent of the variability. Factor loadings range from 0.84 to 0.93. Participants' responses to the four items were averaged to form the measure of perceived ease of use (PEU).

A correlation analysis shows that PU ($r = 0.55, p < 0.01$) and PEU ($r = 0.30, t = 0.03$) of the online system were significantly correlated with participants' intention. Also, these two determinants were significantly correlated to each other ($r = 0.70, p < 0.01$). These results are consistent with those in prior studies (Davis, 1989).

As noted earlier, a factor analysis indicated convergence and high reliability for the three items that measured participants' trust in system reliability. Thus, we averaged participants' responses to form the measure of trust in system reliability (TSR). Similarly, the six items that measured participants' trust in the internet loaded on a single factor accounting for 69 percent of the variability. Factor loadings for the six items range from 0.74 to 0.89. Participants' responses to the six items were averaged to form the measure of trust in internet (TI). TSR ($r = 0.51, p < 0.01$) and TI ($t = 0.47, p < 0.01$) were significantly correlated with participants' intention. Also, TSR was significantly correlated with PU ($r = 0.38, p = 0.01$) and PEU ($r = 0.33, p = 0.02$). However, TI was not significantly correlated with either PU or PEU (both $p > 0.10$).

5.4 Tests of hypotheses

The following regression model was used to test all hypotheses:

$$INT = \alpha + \beta_1PU + \beta_2PEU + \beta_3TSR + \beta_4TI + \beta_5TSR*TI + \varepsilon$$

Measurement	Mean	SD	Cronbach's α
Perceived usefulness	5.38	1.15	0.93
Perceived ease of use	5.23	1.38	0.92
Trust in system reliability	5.24	0.97	0.78
Trust in internet	5.08	1.02	0.91
Intention to adopt	4.69	1.59	0.95

Note: $n = 54$

Table I.
 Descriptive statistics
 and reliabilities

where:

- INT = intention to adopt and use OSBS.
- PU = perceived usefulness of OSBS.
- PEU = perceived ease of use of OSBS.
- TSR = trust in the reliability of OSBS.
- TI = trust in the internet.

Since PU, PEU and TSR were significantly correlated with each other, we first checked the multicollinearity in the regression analysis. The test for multicollinearity shows that the correlations were not large enough to compromise the accuracy of the estimated regression coefficients: variance inflation factors (VIF) were smaller than 2.0 for all four determinants. We report the results of the regression analysis in Table II. It shows that the effect of perceived usefulness of the system on participants' intention was positive and significant ($t = 4.94, p < 0.01$). Thus, *H1* is supported, suggesting that the more useful the online accounting system is perceived to be, the more likely the potential users are to adopt and use it. The effect of perceived ease of use of the system on participants' intention was not significant ($p = 0.31$). Thus, *H2* is not supported. Such a finding is consistent with that in prior studies (Davis, 1989; Gefen *et al.*, 2003b).

Table II also shows that the effect of trust in system reliability on participants' intention was positive and significant ($t = 3.39, p < 0.01$). Thus, *H3* is supported, indicating that trust in system reliability positively influences potential users' intent to adopt an online accounting system. Likewise, the effect of trust in the internet on participants' intention was positive and significant ($t = 3.86, p < 0.01$). This is consistent with *H4* and suggests that trust in the internet positively influences potential users' intention to adopt an online accounting system.

The interaction between TSR and TI on participants' intention to adopt OSBS (coefficient β_5) was significant ($t = -3.08, p < 0.01$). In support of *H5*, it indicates that potential users' intention to adopt an online system is jointly affected by trust in system reliability and trust in the internet. To further examine the nature of the interaction, the scores for both TSR and TI were split into two groups according to their median (5.33 and 5.25, respectively). Participants with scores above (below) the median were considered as having high (low) trust, and their responses were then tested by an analysis of variance (ANOVA)[3]. The results, which are reported in

Parameter	Model: $INT = \alpha + \beta_1PU + \beta_2PEU + \beta_3TSR + \beta_4TI + \beta_5TSR*TI + \epsilon$			
	Standardized coefficients	<i>t</i> -statistics	<i>p</i> -value	
α		-3.82	0.00	
β_1	0.66	4.94	0.00	
β_2	-0.13	-1.03	0.31	
β_3	1.29	3.39	0.00	
β_4	1.46	3.86	0.00	
β_5	-1.97	-3.08	0.00	

Table II.
 Regression results

Notes: INT – intention to adopt and use OSBS; PU – perceived usefulness of OSBS; PEU – perceived ease of use of OSBS; TSR – trust in the reliability of OSBS; TI – trust in the internet

Panel A of Table III, show that participants' intent to adopt the system was lowest (3.41) when both TSR and TI were low. Conversely, participants' intent to adopt the system was highest (5.28) when both TSR and TI were high. More importantly, when participants' trust in the internet was low, they were more willing to adopt the online accounting system if their trust in system reliability was high (mean = 4.88, SD = 1.22) than if their trust in system reliability was low (mean = 3.41, SD = 1.44) ($F = 6.10, p = 0.02$) (see Panel B of Table III). In contrast, when participants' trust in the internet was high, their intention to adopt the online accounting system were not significantly influenced by their trust in system reliability ($F = 1.13, p = 0.30$).

6. Discussion

The present study examines:

- whether potential users of a system perceive the three SysTrust principles to represent a single measure of system reliability as intended by the AICPA and the CICA; and
- the extent to which the reliability of a system, as defined by the SysTrust principles, affects potential users' intent to adopt the system.

The results, conducted in the context of an online accounting system, show that the three SysTrust principles converged on one factor. It provides evidence that potential users of a system perceive the security, availability and processing integrity to capture the reliability of the system as intended by the AICPA and CICA in the performance of a SysTrust service.

To examine the second issue, this study relies on prior research (Davis, 1989; Gefen *et al.*, 2003b; Wu *et al.*, 2011) to include two unique trust components, trust in system reliability (TSR) and trust in the internet (TI), into the technology acceptance model (TAM). The results show that perceived usefulness of the online accounting system positively affected potential users' intent to adopt the system. In contrast, perceived ease of use of the online system did not significantly affect the users' intent to adopt the system. These results are consistent with earlier tests of TAM, which have shown perceived usefulness to be a consistently strong determinant of usage intentions, whereas the effect of perceive ease of use has been less consistent across studies (Venkatesh and Davis, 2000). The results also indicate that the TAM model can be applied to the acceptance of an online accounting system, a specific application that has not been examined in prior research.

Panel A: mean (standard deviation) for participants' intent to adopt			
	<i>Trust in internet – low</i>	<i>Trust in internet – high</i>	
Trust in system reliability – low	3.41 (1.44)	4.50 (2.37)	
	<i>n</i> = 16	<i>n</i> = 5	
Trust in system reliability – high	4.88 (1.22)	5.28 (1.13)	
	<i>n</i> = 8	<i>n</i> = 18	
Panel B: planned comparisons			
	<i>df</i>	<i>F-statistics</i>	<i>p-value</i>
Effect of trust in system reliability in the low trust in internet condition	22	6.10	0.02
Effect of trust in system reliability in the high trust in internet condition	21	1.13	0.30

Table III.
 Trust in system reliability (TSR) and trust in internet (TI) interaction on intent to adopt (INT)

More importantly, this study finds that potential users' trust in the reliability of the online accounting system and their trust in the internet individually and jointly influenced their intent to adopt the system. Specifically, users' intent to adopt the system was highest (lowest) when both TSR and TI were high (low). This suggests that if potential users trust (or do not trust) the reliability of a specific online system and the internet, they will be most (least) willing to adopt the system. In addition, users' trust in system reliability was found to have a more significant effect on their intent to adopt the online system if their trust in the internet was low than when their trust in the internet was high. Thus, the results of this study suggest that the reliability of a system, as measured by the SysTrust principles, is relevant to decisions regarding the adoption of an online accounting system. Such a suggestion provides some support to the importance of the SysTrust assurance service.

Some limitations of the current study should be noted. First, although the present research relied on an established framework for studying technology acceptance, it is possible that other relevant variables may have been omitted. For example, McKnight *et al.* (2002) have suggested that other aspects of trust may be relevant to systems users. These include trust in the competence and integrity of the service provider. Future research may examine whether and how other aspects of trust will influence users' acceptance of technology. Second, the study was conducted in the specific context of an online accounting system, and its findings may not hold in other contexts and for other applications. Future studies can examine the significance of trust in system reliability in other applications and contexts, in order to enable the identification of market segments that are most sensitive to users' trust in the system reliability. Third, since both independent variables and the dependent variable in the present study are perceptual measures derived from the same respondent using similar item characteristics, there is a concern about the common method variances (CMV) that may either inflate or deflate the observed relationships between the variables (Podsakoff *et al.*, 2003; Chang *et al.*, 2010). While the survey design in the present study is adapted from earlier research on TAM and trust (Davis, 1989; Gefen *et al.*, 2003b; McKnight *et al.*, 2002), we conducted several analyses to check the persuasiveness of the CMV and reduce its effect. The analyses include Harman one-factor analysis which shows that the variables did not load on one factor, and the inclusion of a non-linear interaction term in the regression analysis to increase the complexity of the relationships among the variables (Podsakoff *et al.*, 2003; Harrison *et al.*, 1996). However, the effect of the CMV cannot be completely excluded. Future research can examine the extent of any problem due to the CMV. Fourth, participants in this study were a homogenous group of graduating accounting students and none of them had prior experience with the online accounting systems. Although it can be argued that they are acceptable surrogates for entry-level accountants in small to medium size businesses, the research conclusions may not be generalized beyond this group of participants. Future research may replicate the present study among other groups of potential users, who may vary in experience with the online accounting system and other social factors.

Despite these limitations, the present study can contribute to research and practice in several ways. First, it presents more evidence on the validity of the SysTrust service. This evidence provides some support to the continuous effort of the AICPA/CICA in developing such assurance service. Equally important, this evidence can be used by assurance providers to market the SysTrust or other trust service in the areas of

e-commerce or continuous auditing (Bailey, 2000; Bedard *et al.*, 2005; Sutton, 2006), given that assurance providers need to clearly communicate the value of their services otherwise the cost of the assurance service may not be justifiable (Arnold *et al.*, 2000). Second, this study extends the TAM by including two unique trust components in the examination of online behaviors. The proposed ETAM confirms that potential users' trust in system reliability and their trust in the internet are relevant in influencing the intentions of these users. Thus, this extended TAM can be used in subsequent research on the users' adoption of online information systems.

Notes

1. In addition to SysTrust, the AICPA and CICA also developed WebTrust. While SysTrust aims to measure the operational reliability of the firm's information systems, WebTrust aims to provide assurance about security, online privacy, availability, and confidentiality needs in electronic commerce transactions (Bedard *et al.*, 2005; Sutton, 2006). For detailed definitions, see www.webtrust.org
2. For detailed definitions, see the *Trust Services Principles, Criteria and Illustrations* (AICPA/CICA, 2006). Other trust service principles apply only to WebTrust consumer protection. Privacy implies that personal information collected through e-commerce is used and distributed as committed or agreed. Confidentiality, while not part of system reliability, implies that information defined as confidential and collected by the system is available only to those who need access to complete transactions or resolve questions (Bedard *et al.*, 2005, p. 57).
3. Seven individuals with scores on the median were excluded. The results were consistent if the means were used to split the groups.

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Further reading

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Appendix. Measurement items used in the study

Perceived usefulness of a system

- Using the OSBS online system would improve performance on accounting tasks.
- Using the OSBS online system for accounting would increase productivity.
- Using the OSBS online system would enhance effectiveness in performing accounting tasks.
- OSBS online system would be useful for performing accounting tasks.

Perceived ease of use of a system

- My Interaction with the OSBS online system was clear and understandable.
- Interacting with the OSBS online system did not require a lot of my mental effort.
- I found the OSBS online system to be easy to use.
- I found it easy to get the OSBS online system to do what I wanted it to do.

Trust in system reliability

- I trusted that the OSBS online system was available for operation and use at times set forth in the service license agreement.
- I trusted that the OSBS online system was protected against unauthorized physical and logical access.
- I trusted that transaction processing using the OSBS online system was complete, accurate, timely and authorized.

Trust in the internet

- I felt good about how things went when I performed accounting tasks on the internet.
- I was comfortable performing accounting tasks on the internet.
- The internet has enough safeguards to make me feel comfortable using it to perform accounting tasks.
- I felt assured that legal and technological structures adequately protected me from problems on the internet.

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- I felt confident that encryption and other technological advances on the internet made it safe for me to perform accounting tasks there.
- In general, the internet is now a robust and safe environment in which to perform accounting tasks.

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Users' intent to adopt a system

- Considering all the information available, I would adopt and use the OSBS online system.
- I would adopt and use the OSBS online system assuming the price is reasonable.

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