An Integrative Analysis of Transactional E-government Web Usage

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An Integrative Analysis of Transactional E-government Web Usage

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ABSTRACT

With technology advanced and flourishing of wired or wireless networks in our daily life, privacy and trustability of transaction media are highly cherished value. Individuals often make choices in which they surrender a certain degree of privacy in exchange for outcomes that are perceived to be worth of the risk of information disclosure. This research attempts to facilitate understandings of utility of Technology Acceptance Model (TAM) which is a strongly supported and well-established vehicle in information research when it incorporate privacy, risk, and trust factor that are previously regarded as separate research area from TAM. The proposed model was tested using data gathered from 309 respondents from internet survey. Structural equation modeling (SEM) using Mplus was employed to validate measurement and structural model. Based on this outcome, the measurements were redefined as composite scores and subsequent path analysis was conducted to test proposed hypotheses. The findings provide the structural or causal model of proposed model attainable but it requires development of reliable and valid measurement scales.

Keywords
Guides, instructions, length, conference publications.

INTRODUCTION

E-Government can be broadly defined as the delivery of government information and services online though the use of Information and Communication Technology (ICT) (Marchionini et al., 2003). With Internet delivery systems, citizens have unprecedented opportunities for more open access to government information and services. Governments, in turn, enhance responsiveness to citizens and increase public confidence by facilitating two-way interaction between citizens and bureaucrats (Gore, 1993). This interactive nature of e-Government fosters citizen participation in government decision-making and reshapes governance structure in the long run (Fountain, 2001). Despite the promise of e-government as a potential source of new democracy, a series of recent public surveys reveal that it is highly doubtful whether citizens are fully utilizing its capabilities as a two-way communication tool. According to the Pew Internet and American Life Project (2002) survey, most U.S. adults visited e-government to seek tourism and recreational information (77.3%) and do research for work or school (69.8%). Few users said that they used e-government for transactional services including filing taxes (15.7%), renewing a driver’s license (11.5%) and paying a fine (1.7%). A survey done by Hart–Teeter for the Council for Excellence in Government (2003) also reveals a similar trend. Half (63%) of U.S. citizens used e-government to find information such as an office address or a list of services. On the other hand, even in best practice areas, only a quarter (28%) used transactional services such as filing taxes. It seems that most U.S. users consider e-government just as information resources. Therefore, it could be assumed that although most U.S. government agencies have online presence that provides quick access to their information and services, the growth is not well developed into the next stage – online transactional stage (Reddick, 2004). Indeed, some transactional services are seriously underused despite their availability (Wang, 2002).

Although e-Government has drawn considerable attention among researchers since its emergence (Carrizales, 2004), only a limited number of studies have made systematic attempts to provide insight into citizen adoption of online transactional services that require sensitive personal information. Therefore, it is crucial to shed light on factors affecting the continued growth of e-government. Toward this end, we proposes an integrated model that incorporates key constructs such as perceived ease of use, perceived usefulness, trusting beliefs, risk beliefs, and privacy concerns under the nomological structure of the theory of reasoned action. In this way, we highlight important characteristics of citizen acceptance phenomenon.
BACKGROUND

Stages of E-Government Growth

Because e-government is a global phenomenon that affects a wide spectrum of issues, understanding the nature of e-government has become a goal of many researchers from each of different academic disciplines including MIS, public administration and computer science. Despite great diversity in researcher’s backgrounds, however, their studies have more in common in that they have attempted to understand the nature of e-government by outlining the extent of change in its function and structure. The five continua in Figure 1 represent e-government growth models suggested by those researchers. It can be easily identified that the stages of these models are very similar. For example, all five indicate that the initial stage involves providing access to government information and services through the establishment of an online presence.

Figure 1. E-Government Growth Models

Layne and Lee (2001) state that the cataloguing of information on the web is the first stage, followed by online transaction stage. These first two stages can be found in other four studies. The next two stages involve integration between different levels of government and within the same government. The conceptualization of those integration steps also appears in work done by Hiller and Belanger (2001) and West (2004). Hiller and Belanger (2001) propose that the first stage, information dissemination, is followed by the stage of limited two-way communication. In this stage, online service possibilities are limited to a few areas such as renewal of driver’s license and ordering birth certificates. The next stage, the online transaction phase, delivers a range of fully executable services in which transactions can be conducted completely online. West (2004) also emphasizes this distinction in the early stage of two-way communication. After the integration stage, the fifth stage involves new modes of direct citizen participation such as online voting. Many researchers also view this stage as the most advanced e-government (Watson and Mundy, 2001; Marchionini et al., 2003). Hiller and Belanger (2001) emphasize that governments should pay more attention to privacy and security issues because sensitive information is increasingly required as each of the five stages progresses. West (2004) also asserts that a one-stop government portal should take into account the public’s concerns of information privacy. Watson and Mundy (2001) outline three strategic phases of e-government: initiation, infusion and customization. Taking a more political view, the authors argue that democracy is improved as each of three stages progresses because citizens are able to identify how efficiently their governments are operating. The last stage is the implementation of one-to-one relationship between citizen and government. West (2004) also considers customization as the last stage of e-government development. Marchionini et al. (2003) suggest three applications of information technologies to government services: access information, transaction services and citizen participation. Maintaining that these application
areas are interdependent, they encourage researchers to establish methods for assessing the impact of each application on citizen and government.

To summarize, although it is difficult to assume that all e-governments go through a variety of sequences in any particular order, a casual observation of e-government websites shows that those sequences appear to be prevalent courses of development in many e-governments. Using the results of surveys discussed in the previous section as a lens through which to identify the current stage of e-government growth, we suggest that it is situated at an intermediate point between information dissemination and transactions as shown in Figure 2.

<table>
<thead>
<tr>
<th>Information Dissemination</th>
<th>Current Stage</th>
<th>Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenting information about government and its activities on the Web</td>
<td></td>
<td>Allowing citizens to complete online transactions</td>
</tr>
<tr>
<td>• FedStats (<a href="http://www.fedstats.gov">www.fedstats.gov</a>) provides access to more than 100 federal units that offer statistical information.</td>
<td></td>
<td>• Sarasota County of Florida website (<a href="http://www.co.sarasota.fl.us">www.co.sarasota.fl.us</a>) offers Park and Recreation Reservation Services.</td>
</tr>
<tr>
<td>• The Government Services Administration’s Firstgov service (<a href="http://www.firstgov.gov">www.firstgov.gov</a>) provide links to a variety of federal websites.</td>
<td></td>
<td>• Virginia’s Department of Taxation website (<a href="http://www.tax.virginia.gov">www.tax.virginia.gov</a>) provides online transactional services related to taxes.</td>
</tr>
</tbody>
</table>

**Figure 2. The Current Stage of E-Government**

**Comparison between e-commerce and e-Government**

A series of surveys of chief administrative officers at U.S. government agencies reveal that most agencies (90.5% in 2002, 90% in 2004) have not conducted a survey that investigates citizen’s perception of e-government even though most of them (74.2% in 2002, 91.1% in 2004) have developed an online presence (ICMA, 2002; ICMA, 2004). The results show that most government agencies do not pay much attention to citizens concerns that arise with the use of new online services, indicating that they remain largely unaware of the importance of involving end-users for successful system deployment. As discussed previously, just establishing a Web presence does not necessarily motivate citizens to use it. In order to realize its full potential as a two-way communication tool, e-Government should address the whole range of citizen concerns, from ease of use to information privacy.

In this regard, it might be helpful for e-Government to learn from e-commerce industry, which is constantly seeking better ways to understand customer needs. Some practitioners and researchers have already addressed the applicability of e-commerce sector solutions to the e-government context (Dietzel, 2001; Jorgensen and Cable, 2002). Although few in number, there has been systematic attempts to extend the outcomes of e-commerce studies to explore potential factors that determine citizen adoption of e-Government (Wang, 2002; Warkentin et al., 2002; Gilbert and Balestrini, 2004; Carter and Belanger, 2005). All this shows that e-commerce research provides ample theoretical background for identifying factors that influence a deeper transformation of e-government.

**Literature Review and Research Model**

Our theoretical model, referred to as the e-Government adoption model, is presented in Figure 3. The intention to transact with e-Government is proposed as the dependent variable. Based on findings from relevant prior research, the model integrates key factors such as perceived ease of use, perceived usefulness, trust beliefs, risk beliefs and privacy concerns under the nomological structure of the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Sheppard and Hartwick, 1988; Ajzen, 1991). This section elaborates on the constructs in the model and the proposed relationships among them.
Trust Beliefs in e-Government

Trust can be generally defined as the degree to which one believes other party will behave as expected in a socially responsible manner (Mayer et al., 1995). Developing a sound trust relationship is important in many economic transactions where uncertainty is present. This is especially true in a variety of technology-driven environments such as e-commerce (Corbitt et al., 2003; Suh and Han, 2003), m-commerce (Siau and Shen, 2003; Siau 2004), and t-commerce (Yu et al., 2005). In the field of e-commerce, trust has been extensively researched in a variety of ways (Salam et al., 2005). Recognizing previous studies are divergent in how they conceptualize trust, Gefen et al. (2003) maintain that trust in the context of B2C commerce can be defined as (1) a general belief in a Web retailer that leads to behavioral intention, (2) as a combination of trustworthiness, integrity, and benevolence of Web retailers that increases behavioral intentions through reduced risk among potential but inexperienced consumers, (3) as beliefs in integrity, benevolence, and ability that result in a general belief in trust, or (4) as specific beliefs in competence, integrity, and benevolence that result in trusting intentions. Although slightly different in their conceptualization of trust, these studies identify building consumer trust in Web retailers as one of the important factors that influence intention to engage in e-commerce transactions and thus facilitate the continued growth of B2C commerce.

E-government is also characterized by the lack of a physical presence and its uncertain environment (Warkentin et al., 2002). Presumably, this impersonal nature may lead citizens to develop low confidence in online transactional services that require sensitive personal information. Indeed, those services might face more scrutiny from citizens than Web tailors do. Therefore, it is essential to develop citizen trust in e-Government for the continued growth of e-government. Among four perspectives above, this study adopts the view that conceptualizes trust as a set of specific beliefs (McKnight et al., 1998; McKnight et al., 2002). We define trust beliefs in e-government as a set of salient beliefs that allow citizens to willingly rely on e-Government and provide sensitive personal information in situations where such actions make the citizen to become vulnerable to e-Government (Warkentin et al., 2002). This definition includes the most widely used specific beliefs – benevolence, integrity, honesty, reliability and predictability (Gefen et al., 2003). As Pavlou (2003) points out, these salient beliefs may include not only trust in a specific party (i.e. online store) but also trust in the integrity of the transaction medium (i.e. Internet, interface). In the context of e-Government, Carter and Belanger (2005) argue that situational normality (trust of Internet) is positively related to citizens’ intentions to use online transactional services. However, the role of trust in the infrastructure is excluded from our definition because ample e-commerce literature shows that Web tailors can significantly influence consumer trust in the infrastructure through a variety of behavioral actions that intend to reduce consumer concerns associated with uncertain online environment and increase consumer trust in e-commerce (e.g., online privacy seal program: Benassi, 1999; Lou, 2002). This view is also shared by Pavlou (2003), who argued that trust in Web tailors embraces a considerable portion of

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**Figure 3 E-Government Adoption Model**

### Individual Traits
- **Collection**
- **Control**
- **Awareness**

### Situation-specific Traits
- **Risk Beliefs**
- **Intention to Use**

<table>
<thead>
<tr>
<th>Control Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Gender</td>
</tr>
<tr>
<td>- Age</td>
</tr>
<tr>
<td>- Education</td>
</tr>
<tr>
<td>- Internet experience</td>
</tr>
<tr>
<td>- Invasion of privacy in past</td>
</tr>
<tr>
<td>- Media exposure</td>
</tr>
<tr>
<td>- Income level</td>
</tr>
</tbody>
</table>

---

**First-Order Construct**

**Second-Order Construct**

---

**Positive Effect**

**Negative Effect**

---
H1: Citizens intentions to transact online with e-Government are positively related to trust beliefs in e-Government.

Risk and Trust Beliefs in e-Government

When engaging in an online transaction process that requires sensitive personal information, a consumer tends to be uncertain about the risks at present and their effects (Jarvenpaa and Tractinsky, 1999; Jarvenpaa et al., 2000; Pavlou, 2003). In the context of inter-organizational relationships, risk beliefs have been conceptualized to encompass two forms of uncertainty including behavioral uncertainty (the trading partner) and environmental uncertainty (the infrastructure) (Ring and Van de Ven, 1994; Bensaou and Venkatraman, 1996). However, in the context of B2C commerce, consumers tend to develop their own subjective expectations of the Web tailor during online transaction processes, making it difficult to capture risk itself as an objective reality (Pavlou, 2003). As a result, these two forms of uncertainty have been viewed collectively – as a higher-order unidimensional construct (Jarvenpaa and Tractinsky, 1999; Jarvenpaa et al., 2000; Pavlou, 2003). Following this notion, this study defines risk beliefs as the degree to which a citizen subjectively assesses the uncertainty and adverse consequences of engaging in e-Government transactional services (Warkentin et al., 2002). Risk beliefs, as a set of salient belief, are expected to lower citizens’ intention to use online transactional services. Because high levels of risk beliefs represent lack of behavioral control, this argument can be explained by TRA, which indicates that the perceived behavioral control influences IT use intentions (Taylor and Todd, 1995).

H2: Citizen intentions to transact with e-Government are negatively related to risk beliefs in e-Government.

Trust and risk are closely interrelated because trust plays an important role in attenuating one’s risk beliefs (Mayer et al., 1995; Lou, 2002; Sirdeshmukh et al., 2002). In B2C e-commerce context, trust helps reduce the uncertainty a consumer faces and thus can be considered as a mechanism that mitigates the consumer’s risk beliefs during an online transaction (Jarvenpaa and Tractinsky, 1999; Jarvenpaa et al., 2000; Pavlou, 2003; Malhotra, 2004). Extrapolating from these findings to the context of e-Government, we propose that trust beliefs in e-Government could be depicted as a function of the levels of risk beliefs in e-Government.

H3: Risk beliefs in e-Government are negatively related to trust beliefs in e-Government.

Technology Acceptance Model and Intention to Transact with e-Government

In essence, the Technology Acceptance Model proposes that perceived ease of use and perceived usefulness are salient behavioral beliefs that determine consumer intentions to use information technologies (Davis, 1998). TAM has been widely used to describe and predict the use of a variety of new information technologies (Venkatesh and Davis, 2000) including Internet-based technologies (e.g., online recommendation agents: Wang and Benbasat, 2005). Unlike trust beliefs and risk beliefs, perceived ease of use and perceived usefulness have drawn considerable attention among researchers who examined the adoption of e-Government transactional services (Wang, 2002; Warkentin et al., 2002; Gilbert and Balestrini, 2004; Carter and Belanger, 2005). Using TAM as a basic framework, these studies show the applicability of TAM in understanding citizen perception of e-Government services. A recent survey (Hart-Teeter, 2003) also indicates that citizens value the ease
and efficiency as the potential benefits of e-Government, further suggesting that corresponding TAM variables could be useful in e-Government context.

Following previous work (Davis, 1989; Warkentin et al., 2002), we define perceived usefulness as the degree to which a citizen subjectively assesses the utility of e-Government transactional services. Perceived ease of use refers to the degree to which a citizen believes that utilizing those services will be effortless. There is a broad agreement that each construct has a positive relationship with intentions to use Internet-based systems (Lederer et al., 1999; Moon and Kim, 2001) including online tax filing systems (Wang 2002). In addition, these studies show that perceived ease of use influences intentions indirectly through perceived usefulness. Therefore, we hypothesize that all three paths previously validated in a number of studies apply to e-Government.

H4: Citizen intentions to transact with e-Government are positively related to the perceived ease of use of e-Government.

H5: Citizen intentions to transact with e-Government are positively related to the perceived usefulness of e-Government.

H6: The perceived usefulness of e-Government is positively related to the perceived ease of use of e-Government.

Nature of the Relationships between TAM and Trust

As discussed previously, a large body of the literature provides sound theoretical and empirical supports for identifying factors that influence usage intentions of a variety of information technologies. In B2C commerce context, both trust and two constructs from TAM have been widely suggested as the most crucial determinants that explain a significant part of usage intention (Salam et al., 2005). In addition, there is a great deal of literature (Chiricu et al., 2000; Gefen et al., 2003; Gefen and Straub, 2003; Pavlou, 2003) that investigated the relationships among three constructs. Ring and Van de Ven (1994) suggest that trust helps lower a sense of the costs (time and effort) that each party will face. In a trusting relationship where monitoring or legal guarantees are impractical, people willingly depend on the other party and take actions. Otherwise, a consumer should devote previous resources in monitoring and controlling the situation. This makes the transaction much difficult to the consumer. In the context of B2C commerce, trust positively influences perceived ease of use by decreasing the need for a buyer to invest time and effort to identify all aspects of a seller (Chiricu et al., 2000; Pavlou, 2003). Applied to e-Government context, this notion supports the following hypothesis.

H7: Trust beliefs in e-Government are positively related to the perceived use of use of e-Government.

Research following social exchange theory (Thibault and Kelley, 1959) shows that trust increases perceived usefulness in an online environment (Gefen and Keil 1998; Gefen et al., 2003). The central theme of social exchange theory is that when there is social uncertainty as to how others will behave, trust determines people’s expectations from the relationship – the nature of the utility expected (Konovsky and Pugh, 1994; Fukuyama, 1995). Chiricu et al. (2000) argued that trust positively affects perceived usefulness because trust allows consumers to depend on the Web tailor and gives an assurance that they can gain any utility from the transaction. Pavlou (2003) also shares this view, maintaining that trust forms a significant part of guarantee that consumers will gain their expected usefulness from the Web tailor. Applied to e-Government context, trust is viewed as a measure that increases citizen’s subjective beliefs that e-Government will provide what has been expected in a socially responsible manner (Warkentin et al., 2002). In this way, trust allows citizens to expect that they gain benefits from using online transactional services.

H8: Trust beliefs in e-Government are positively related to the perceived usefulness of e-Government.

Citizens’ Information Privacy Concerns as Antecedent of Trust and Risk Beliefs
As discussed previously, there are significant challenges to the further growth of e-Government – from information dissemination to transactions. Despite their availability, online transactional services appear to be underutilized. However, this does not mean citizens are not interested in using e-government for transactions. A series of recent surveys indicate that this low acceptance of transactional services is primarily due to the public’s privacy concerns. The Hart–Teeter national survey reported by GAO (2001) found that although U.S. citizens believe e-government services are beneficial, they are reluctant to provide personal information with the government over the Internet. A survey conducted by Hart–Teeter for the Council for Excellence in Government (2003) also reveals that the use of e-government for online transactions is still uncommon even though half of users (65%) expressed strong interest in transactional services. In a recent survey by the Gallup Organization, most respondents (85%) listed online privacy as their top issue. Moreover, this issue is stifling the growth of e-government around the world. According to a report from Taylor Nelson Sofres (2002) that examined e-government in 27 countries and surveyed more than 29,000 people, only one-tenth (7%) of users engaged in transactional services that request personal or household information. A recent survey by Accenture (2004) that investigated e-government in 22 countries also identifies the lack of citizen confidence in online privacy as one of the main barriers hampering the development of e-government around the world. Clearly, there is ample evidence that citizens’ concerns of information privacy should be viewed as one of the crucial factors that influence the acceptance behavior of online transactional services. However, previous research on citizen adoption of e-Government has yet to identify privacy concerns as a major factor. Therefore, to better highlight citizen acceptance phenomenon, our theoretical model includes this construct – the inherent privacy concerns that arise with the use of online transactional services.

Indeed, the issue of information privacy is not new. Westin (1967, p.7) defines information privacy as “the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated with others.” Since companies have begun to collect customer information, the issue has dawn considerable attention among scholars (Milberg et al, 1995; Culnan, 1993; Henderson and Snyder, 1999) and practitioners (Stepanek, 1999; Green, 2001). Furthermore, with the rapid advance in new information technologies, companies now efficiently collect, store, use, and communicate consumer information for various marketing purposes (Campbell, 1997; Glazer, 2001). However, this practice has led consumers to be more concerned about their privacy and to react by being unwilling to provide their information (Hagel and Rayport, 1997; Olivero and Lunt, 2004).

Several studies (Smith et al, 1996; Stewart and Segars, 2002; Liu et al., 2004; Malhotra, 2004) have attempted to conceptualize and measure such concerns. For this study, we adopt Malhotra et al.’s Internet Users’ Information Privacy Concerns (IUIPC), designed to measure Internet users’ concerns about information privacy. Based on social contract theory that is rooted in the principle of procedural justice (Gililand, 1993), the scale takes into account recent changes in an individual’s views on fairness because of the common use of the Internet (Malhotra, 2004). Thus, it provides both a practical and theoretical foundation for better conceptualization of privacy concerns within the context of an online environment. Extending their work, we define Citizens’ Information Privacy Concerns (CIPC) as the degree to which a citizen subjectively views fairness/justice of e-Government transactional services and conceptualize CIPC as a second-order factor that consists of three first-order factors including collection (whether the exchange of personal information is equitable), control (whether I have control over the data) and awareness (whether I am adequately informed about the use of the data).

Because people have different views of fairness/justice regarding e-Government’s use of their personal information, CIPC is viewed as a personal trait. In addition, this study focuses on inexperienced citizens with online transactional services. With these distinctions in mind, to identify relationships between CIPC and other constructs, we rely on personality-based trust research stream, which suggests that personal dispositions play important role in creating initial trust beliefs and risk beliefs (Mayer et al., 1995; McKnight et al., 1998; McKnight et al., 2002). In the context of B2C commerce, individual traits also strongly influence initial trust formation (Reichheld and Schefter, 2000). Although conceptualizing privacy concerns differently, Liu et al. (2004) suggested that privacy acts as the major antecedent of trust, which in turn influences the behavioral intentions. In fact, Malhotra et al. (2004) empirically showed that IUIPC has significant relationships with both trusting beliefs and risk beliefs, indicating that users who tend to worry over their information privacy are likely to be low on trust beliefs and high on risk beliefs. Following Malhotra et al., this study proposes that CIPC, as an individual trait, influences trusting beliefs negatively and risk beliefs positively (see Figure 3). In this way, CIPC is posited under the nomological structure of TRA, which suggests that the impact of personal dispositions (CIPC) on behavioral intention is fully mediated by salient beliefs (trusting beliefs and risk beliefs).

H9: Citizens’ information privacy concerns are positively related to risk beliefs in e-Government.
H10: Citizens’ information privacy concerns are negatively related to trusting beliefs in e-Government.

METHODOLOGY

Scale Development and Survey Administration

The present research model was empirically tested using data collected with an Internet survey that included items for the constructs specified in the model. We adopted the research frameworks by Malhotra et. al. (2004) and Davis (1986) to construct initial set of items by reflecting on the proposed theoretical model. Collection, Awareness, and Control items were based on the instruments developed by Malhotra et. al. and refined further to fit the our research context. Risk Belief and Trust Belief constructs were measured by 5 items each based on Pavlou (2003). The two items for independent constructs of TAM, that is Perceived Ease of Use and Perceived Usefulness, were developed by Venkatesh and Davis (2000), and Pavlou (2003). Finally, the behavioral intention was measured by 6 items that are based on willingness to provide private information for Internet transaction by Dinev and Hart’s (2006).

All the instrument items used a seven-point Likert scale and the survey was administered to a random sample of individuals in Korea through Internet. Participation was voluntary and the respondents who chose to participate were asked to visit a relevant g-government web site to quantify participant’s perceptual easiness and usefulness about e-government services. The survey respondent profile (sample size 309) is given in Table 1.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Percentage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>&lt; 25 years</td>
<td>143 (46.3%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>25 – 34 years</td>
<td>165 (53.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35 – 44 years</td>
<td>8 (2.6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45 – 54 years</td>
<td>48 (15.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55 – 65 years</td>
<td>1 (0.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 60 years</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Income</th>
<th>Percentage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>some school, no degree</td>
<td>&lt; $ 10000</td>
<td>5 (1.6%)</td>
<td></td>
</tr>
<tr>
<td>high school graduate</td>
<td>$10000 – $20000</td>
<td>25(8.1%)</td>
<td></td>
</tr>
<tr>
<td>some college, no degree</td>
<td>$20000 – $30000</td>
<td>131(42.4%)</td>
<td></td>
</tr>
<tr>
<td>bachelor’s degree</td>
<td>$30000 – $40000</td>
<td>85(27.5%)</td>
<td></td>
</tr>
<tr>
<td>master’s degree</td>
<td>$40000 – $50000</td>
<td>46(14.9%)</td>
<td></td>
</tr>
<tr>
<td>doctorate degree</td>
<td>$50000 – $60000</td>
<td>15(4.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; $60000</td>
<td>17(5.5%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Descriptive Statistics of Respondents (N = 309, missing = 1)

Structural Equation Modeling – Measurement Model

Anderson and Gerbing (1988) suggests that to avoid misinterpretation of structural relationships, researchers should first estimate a measurement model before testing hypotheses. The present research adopted this two-step approach in which first a valid and reliable measurement was established, and then the structural model of Figure 3 was tested. As the first step, we conducted a confirmatory factor analysis (CFA) on the data collected from the Internet survey to examine the measurement model. Since the sample size usually tends to overestimate the exact-fit index, chi-square, we mostly relied on close-fit indices. In particular, model fit were assessed in terms of three indices: comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The recommended cut-off criteria for those indices are CFI > 0.95, RMSEA < 0.06, and SRMR < 0.08 (Hu and Bentler 1999).

The result of CFA indicated that the initial measurement model did not fit the data well [$\chi^2(495) = 1703.031$, CFI = 0.812, RMSEA = 0.089, SRMR = 0.096]. After inspecting the modification index provided by Mplus output, we refined measurement items by rearranging them to other latent constructs and establishing correlation among indicators as suggested.
Specifically, we reassign Risk Belief (RB) item number 5 to one of Trust Belief (TB) indicators, Perceived Usefulness (PU) item number 4 to Perceived Easiness (PE) and Control item number 3 to Collection construct. We also allowed PU1 and PU2, TB1 and TB2, and RB3 and RB4 correlated each other. The modified model, however, did not show drastic improvement in model fit [$\chi^2(493) = 1375.051$, CFI = 0.863, RMSEA = 0.076, SRMR = 0.075] and yet it fitted poorly the data even though the more constraint model, the later revealed significantly better fit than the parsimonious model ($\Delta\chi^2(2) < 0.0000$).

### Structural Equation Modeling – Structural Model

Since the measurement model failed to provide concrete measurement background, we decided not to test hypotheses using the structural model where all latent constructs indicated by manifest variables. Rather, we chose to test the hypotheses and causal relationships using composite scores of indicators by averaging them and treat previously latent variables as manifest variables.

To make more sound analysis, we decided to abandon all instrument scaling that we relied on for the measurement model. Rather we performed exploratory factor analysis (EFA) to redefine and scale measures in a different way. Factor analysis with oblimin rotation was performed through SPSS Principal Axis factoring all 34 items from 8 different constructs. Seven factor having greater than eigenvalue of 1 were identified and extracted.
Intention2  .039  -.238  .002  -.731  .019  -.059  -.100  
Intention3 - .034  .022  .052  -.693  -.031  .066  .009  
Intention4  -.040  .337  .168  -.601  -.015  .096  -.022  
Intention5  -.046  .252  .106  -.672  .022  .082  .003  
Intention6  .192  .108  -.104  -.487  -.019  .044  -.374  

<table>
<thead>
<tr>
<th>IV</th>
<th>Estimate</th>
<th>S.E</th>
<th>t-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.170</td>
<td>0.078</td>
<td>2.168</td>
</tr>
<tr>
<td>Collection</td>
<td>-0.164</td>
<td>0.053</td>
<td>-3.115</td>
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<tr>
<td>Control</td>
<td>0.249</td>
<td>0.066</td>
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<tr>
<td>Collection</td>
<td>0.383</td>
<td>0.045</td>
<td>8.591</td>
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<td>TB</td>
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<td>0.048</td>
<td>-1.130</td>
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<tr>
<td>TB</td>
<td>0.271</td>
<td>0.044</td>
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<tr>
<td>PE</td>
<td>0.639</td>
<td>0.074</td>
<td>8.628</td>
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<tr>
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<td>PU</td>
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</table>

**Table 2. Factor Loading**

Loadings of variables on factors, communalities, and percents of variance and covariance are shown in Table 2. According to the result, we can interpret Control and Awareness are not two distinctive constructs that were previously considered as different constructs. In addition, some items from Perceived Usefulness (item 3 and 4) loaded on Perceived Easiness construct and one of Risk Belief (item 5) actually belonged to Trust Belief.

Before we conducted path analysis using new measurement scale, we also examined the reliability of the measurement. All seven measures indicated Cronbach’s alpha greater than 0.822.

Subsequently, we further carried out the path analysis with proposed causal relationship model. The result was satisfactory as it was initially expected. Fit indices showed significant improvement [$\chi^2(7) = 19.239$, CFI = 0.968, RMSEA = 0.075, SRMR = 0.044].

**HYPOTHESES TEST AND DISCUSSION**

The present research adopted two distinctive information systems models that are assessing end-user’s behavioral intention and combined them together to develop a more integrated model by taking into account current individual’s privacy concerns.

Even though all measurement scales were adopted from prior literatures, CFA did not turn out desirable outcome of model fit. As an alternative approach we carried out path analysis using composite score of latent constructs. Contrarily to the measurement model and the subsequent structural model, the result of the analysis indicated the path model was well suited to the collected data. Hence we were able to conducted hypotheses testing as the next step. The result revealed that all hypotheses except H2 and H3 were supported. Table 3 summarizes the path loadings of the hypothesized path model.

A successful verification of the path model suggested a possible remedy for the structural model with latent constructs. From this result, we were aware most of causal relationships between constructs valid rather a big problem lies in measurement portion of the model. As examined already, problem in measurement may be stemmed from intermingles of numerous indicators representing each latent construct, which is most likely to lead multicollinearity problem among indicators.
Table 3. Path Model Results

Another possible cause of measurement problem is violations of multivariate normality and linearity of indicators. To assess the problem we construct histogram for visual inspect of normality using SPSS. most of indicators seriously skewed and were out of bell-shaped. Even though the survey instrument were adopted from well-established measuring scales, there may be some flaws involved while it was converted into present research context or translated into Korean language.

CONCLUSION

REFERENCES

(ENSURE THAT ALL REFERENCES ARE FULLY COMPLETE AND ACCURATE AS PER THE EXAMPLES)