2-2014

Personal cloud user acceptance: The role of trust and perceived risk in the technology acceptance model

Murad Moqbel
The University of Texas Rio Grande Valley

Valerie L. Bartelt

John Cicala

Recommended Citation

Moqbel, M., Bartelt, V., Cicala, J. (2014). Personal cloud user acceptance: The role of trust and perceived risk in the technology acceptance model. Proceedings of the Southwest Decision Science Institute Forty-Fifth Annual Conference, March 11–15, Dallas, TX, 881-889.

PERSONAL CLOUD USER ACCEPTANCE: THE ROLE OF TRUST AND PERCEIVED RISK IN THE TECHNOLOGY ACCEPTANCE MODEL

Murad Moqbel, PhD
Health Information Management & Health Informatics
University of Kansas Medical Center
Mailstop 2008
3901 Rainbow Boulevard,
Kansas City, KS 66160
Tel: (913) 588-4530
Email muradmoqbel@gmail.com

Valerie Bartelt, PhD
Department of Management, Marketing and Information Systems
BUSA 116
MSC 182 Texas A&M University-Kingsville
Kingsville, Texas 78363-8202
voice: 361-593-4066
Email: Valerie.Bartelt@tamuk.edu

John E. Cicala, PhD
Department of Management, Marketing and Information Systems
BUSA 212
MSC 182 Texas A&M University-Kingsville
Kingsville, Texas 78363-8202
voice: 361 593-3939
Email: John.Cicala@tamuk.edu

ABSTRACT

This research considers technology adoption issues, as well as risk and trust factors, that lead to behavioral intention of personal cloud computing. We are interested in whether similar results are found in personal cloud computing, a tool that may be perceived as having more risks. Our research found that perceived risk decreased behavioral intentions. Perceived usefulness served as a mediator between trust and behavioral intentions, significantly increasing both relationships. Trust was found to decrease perceived risk; however, it directly increased behavioral intention, perceived usefulness, and perceived ease of use. Interestingly, perceived ease of use did not significantly affect behavioral intentions. This leads to the finding that perceived usefulness may be a greater contributing factor than perceived ease of use in behavioral intention for personal cloud computing. In this research study we offer an interesting perspective on the acceptance of personal cloud computing and explore individual user acceptance of cloud computing.

INTRODUCTION

There is increasing research on the acceptance of the specific technological innovation known as cloud computing (Takabi, Joshi, & Ahn, 2010; Huang & Nicol, 2013; Lin & Chen 2012). Cloud computing consists of software programs and applications that are available to multiple users simultaneously through the Internet, as opposed to physically installed software on individual local computers (Behrend, Wiebe, London, and Johnson 2011). It has the potential to revolutionize an already revolutionary technology by significantly shrinking the high costs associated with physically storing data while raising the capacity, productivity, and magnitude of a global computing model (Gupta, Seetharaman, & Raj, 2013; Takabi, Joshi, & Ahn, 2010). The ability to dramatically lower capital expenditures on computer hardware, software, information technology support, and data security and storage were cited by almost 70% of respondent companies as reasons to adopt cloud services (Brender & Markov 2013).

The same benefits that are available to companies via clouds are also available to individual consumers as well. In much the same way that mp3 files are the latest storage option for music consumers, cloud computing is simply the latest storage/processing option for data consumers that began with hard drives and transitioned through floppy disks, diskettes, CD-ROMs, and flash drives. Philosophically, cloud computing could become the modern technology Heidegger once envisioned, through which the "standing-reserve" of everyone and everything awaiting use is finally revealed (Hanks, 2009).

Despite the immense potential that cloud-computing technology holds for both organizations and individuals, it is not free of threats or risks. Featherman and Pavlou (2003) revealed that the acceptance of online services is adversely affected primarily by risk perceptions and that perceived ease of use of such service reduced these risk concerns. Clearly, cloud computing is, by its very nature, a type of online service, yet the role perceived risk plays in its acceptance by users is still unknown. The implications of integrating perceived risk into the proposed e-services adoption model are perceived risk and trust which are crucial variables in clarifying user acceptance of information and communication technology (ICT) in e-commerce.

Kuyoro, Ibikunie, and Awodele (2011, p. 247, 253) warn that "…consumers need to be vigilant in understanding the risks of data breaches in this new environment," and that "one must be very careful to understand the security considerations and challenges which are currently faced in the cloud computing…." Among the risks for users of cloud computing is the lack of control over cloud availability due to server maintenance, outages, or other unforeseen circumstances. Therefore, lack of support is given as a downside (Behrend, et al. 2011). Lin and Chen (2012, p. 534) caution that the "lack of standardization of application program interfaces and platform technologies means that interoperability among platforms is poor… consumers face vendor and data lock-in…privacy and data confidentiality is one of the most cited objections to cloud computing." Almost 90% of potential cloud computing consumers in a 2010 survey by the Fujitsu Research Institute reported being worried about exactly who has access to their data and what occurs behind the scene on the physical server. In this study we define personal cloud computing as *an online service that provides individual users with the ability to store, synchronize, and share content over the Internet.*

However, much like early academic research devoted to the Internet, the majority of existing research on cloud computing is organizational-centric (Gupta, Seetharaman, & Raj, 2013; Lin & Chen 2012; Takabi, Joshi, & Ahn, 2010); it does not address *personal* usage of this phenomenon. Our research begins to fill this increasing void in available literature by investigating how perceived Usefulness (PU), perceived ease of use (PEOU), perceived risk (PR) and perceived trust (PT) impact and influence *individual user* acceptance of cloud computing.

RESEARCH BACKGROUND, EXISTING LITERATURE, AND HYPOTHESES

Technology Acceptance Model (TAM)

Individual acceptance of computer technology has been the focus of much academic research over the past several decades. The early leading studies from this impressive body of work are by Davis (1989) and Davis, Bagozzi, and Warshaw (1989) on TAM. Davis's (1989) initial work is actually an extension of seminal work of Fishbein and Ajzen (1975) on attitudinal influence of behavior. The initial TAM states that acceptance of technology by individuals depends mainly on two perceptual drivers: (1) the perceived usefulness and (2) the perceived ease of use of the technology in question. Perceived usefulness refers to the degree that people believe the new technology can strengthen or improve their performance. Perceived ease of use refers to how effortless it is to use a specific technological innovation (Davis 1989; Yang & Yoo, 2004). As Svendsen, Johnsen, Almas-Sorensen, and Vitterso (2011, p. 323) simply phrased it, "People who find a technology useful and easy will intend to use it."

A revision of the model a decade later by Venkatesh and Davis (2000), known as TAM2, found that both social influence and cognitive instrumental processes also influence an individual user's acceptance of technology. These findings were the result of a longitudinal study of four different systems at four organizations. It identified subjective norms, image, job relevance, and performance expectancy as determinants of perceived usefulness. Venkatesh (2000) identified possible determinants of perceived ease of use, including computer self-efficacy, computer anxiety, computer playfulness, and perception of external control. It is important to keep in mind that these influences were investigated in an organizational and not a personal context.

More recently still, Venkatesh and Bala's (2008) exploration of the determinants of both perceived usefulness and perceived ease of use resulted in TAM3. This latest revision asserts that perceived ease of use actually influences perceived usefulness. The user's own personal experience acts as a moderator; that is, as experience with technology increases, it becomes easier to use, thus increasing the perception of its usefulness (Venkatesh and Bala 2008). However, in this study we integrate TAM1.

Perceived Usefulness (PU)

Perceived usefulness is defined, conceptually, as "the degree to which an individual believes that using a particular system would enhance his or her job performance" (Davis 1993, p. 477). According to a study of household computer use between the years 1999 and 2010, nearly 70% of U.S. households were using the Internet in 2010, a 30% increase compared to the beginning of the decade. This research reported that approximately 85% of

respondent American households were using computers and online technology for shopping, hobbies, games, and entertainment (Venkatesh, Dunkle, and Wortman 2011). These findings imply that the majority of U.S. households perceive computer-based technology as being useful. People would not increase the amount of time that they spent on the Internet unless they perceived it as having some useful component, even if solely for entertainment purposes. Similarly, we believe that those who perceive cloud computing to be useful will experience a greater intention to use personal cloud computing, i.e., perceived usefulness of personal cloud computing is followed by behavioral intentions. This leads to the following hypothesis:

H1: *Perceived usefulness is positively associated with behavioral intention to use personal cloud computing.*

Perceived Ease of Use (PEOU)

The conceptual definition of perceived ease of use is "the degree to which an individual believes that using a particular system would be free of physical and mental effort (Davis 1993, p. 477). Research on TAM has shown that effort expectancy affects perceived ease of use (Lee & Song, 2013; Venkatesh et al., 2003; Moqbel, 2012). For instance, perceived ease of use is a key driver of consumer acceptance of e-commerce as it facilitates Web-based processes such as interacting with Web retailers (Pavlou, 2003). Similarly, we believe that cloud computing, also a Web-based interaction, will have similar ease of use perceptions. Perceived ease of use will increase people's behavioral intentions to use personal cloud computing because people's perceptions typically affect behavioral intentions. Therefore, the following hypothesis is proposed:

H2: *Perceived ease of use is positively associated with behavioral intention to use personal cloud.*

According to at least one study, tt has been shown that the perceived usefulness of a technology is 50% more influential in determining whether it will actually be used than is perceived ease of use (Davis, 1993). Venkatesh and Bala (2008) declare in their TAM3 model that perceived ease of use actually influences perceived usefulness. The user's own personal experience acts as a moderator; that is, as experience with technology increases, it becomes easier to use, thus increasing the perception of its usefulness. We similarly hypothesize:

H3: *Perceived ease of use is positively associated with perceived usefulness.*

Perceived Risk (PR)

Bauer (1960) first introduced the theory of perceived risk in consumer behavior literature. It refers to the extent to which end users are uncertain about the unfavorable consequences of the use of a product, personal computing technology in this case. Perceived risk is also an individual's belief about the potential uncertain negative outcomes from online interactions (Kim, Ferrin, & Rao 2008). Regarding the Web, risk may be categorized as one of three predominant types: financial (including opportunity costs as well as time and effort), product (defective, fails to perform as expected), and information (i.e., security and privacy) (Kim, Ferrin, & Rao 2008). We are primarily concerned with personal information in this paper. When users are uncertain about the consequences of keeping their personal information in a personal cloud, they are less willing to use such technology. Individual perceived risk is influential with regard to online interactions, for example in decision-making (Antony, Lin, & Xu, 2006). In fact, almost half (45%) of the respondents in a 2010 research survey of almost 2,000 American businesses and IT professionals felt that the risks of cloud computing outweighed the benefits (Brender & Markov 2013). Cloud computing is described by Brender and Markov (2013, p. 726) as being "fraught with risks." They advise potential organizational users of this "least transparent externally provided" source of data storage and processing to thoroughly scrutinize the providers for "security, confidentiality, auditability, regulatory compliance, and a host of other risks" before participating. On a personal level, there are several serious privacy and security threats created by placing one's data and running software programs and applications via an unknown hard drive. These threats include potential data loss, phishing, and having your own system hacked (Kuyoro, Ibikunie, and Awodele, 2011; Takabi, Joshi, & Ahn, 2010). Since perceptions are often followed by behavior, it is reasonable to posit that

perceived risk of the use of personal cloud computing will negatively affect intention to use. This leads to the following hypothesis:

H4: *Perceived risk is negatively associated with behavioral intention to use personal cloud computing.*

Trust

Trust has been shown to act as a key influencer of individual acceptance of online technology in areas such as shopping, mobile banking, and e-commerce (Gefen, Karahanna, & Straub, 2003; Kim, Ferrin, & Rao 2008; Pavlou 2003; Srivastava 2013). For instance, trust in e-government was found to be the main determinant of the perceived usefulness of e-government services (Horst, Kuttschreuter, & Gutteling 2007). Trust has been defined in a variety of ways in academic research over the years. Cloud computing trust can be simply seen as an individual's perceived degree of confidence in using the cloud for data storage and/or processing (Ko, Jagadpramana, Mowbray, Pearson, Kirchberg, Liang, & Lee, 2011). Huang and Nicol (2013, p. 2) define trust as "a mental state comprising expectancy…belief…willingness to take risk...." They stress, "It is important to understand that the expected behavior of the trustee is beyond the trustor's control; the trustor's belief…is based on the trustee's capability, goodwill, and integrity." They also assert that any potential cloud services user will *first* ask if the service can be trusted. If the trust component is non-existent, there will be no behavioral intention to accept the technology offered, thus by default eliminating the formation of any perceptions concerning risk, usefulness, or ease of use. This leads to the following proposed hypotheses:

H5: *Perceived trust is positively associated with behavioral intention to use personal cloud computing.*

H6: *Perceived trust is positively associated with perceived ease of use of personal cloud computing.*

H7: *Perceived trust is positively associated with perceived usefulness of personal cloud computing.*

H8: *Perceived trust is negatively associated with perceived risk of personal cloud computing.*

RESEARCH METHOD

Several constructs were operationalized as latent variables with the goals of minimizing measurement error from perception-based question-statements and of minimizing collinearity among latent variables (Gefen et al., 2000; Schumacker & Lomax, 2004). All latent variables were modeled as reflective (Chin, 1998; Petter et al., 2007). A multidimensional scale developed by Gefen et al. (2003) and consisting of four indicators was used to measure the *perceived risk* of using personal cloud computing. For example, one item from the *perceived risk* scale is "In general, it would be risky to keep my personal information on a personal cloud." *Perceived ease of use* was measured with a scale from Wu and Wang (2005) consisting of three indicators concerning the ease of learning to use personal cloud tools. A sample item states "I think becoming skillful at using personal cloud computing tools is easy." A five-indicator scale from Venkatesh and Morris (2000) was used to measure *perceived usefulness*. A sample indicator from this scale is "Using personal cloud computing tools would improve my performance." The *intention to use* latent variable scale was from Agarwal and Karahanna (2000) and Davis et al (1992).

All latent variables in the research instrument used seven-point Likert scale ranging from 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = moderately agree, to 7 = strongly agree.

A total of 265 completed questionnaires were obtained from students from two universities in southwest Texas. Females contributed 52.1% of the responses. The average age of the respondents was 23.8 years, with a standard

deviation of 8.70 years. The majority of respondents were Hispanic (67%), followed by white (30%), and other (3%). In terms of educational level, 20% of the respondents had only completed high school, 20.4% had a 2-year college degree, 55% had a 4-year college degree, 4.5% had a master's degree, and 1.9% had a doctoral degree. In terms of employment status, 22.3% of the respondents were employed full time, 52.5% were employed on a part-time basis, and 27.2% were unemployed. The average work experience was 5.5 years. Control variables included Gender, race, educational level, and age in years.

PLS-based structural equation modeling was employed as the data analysis method for this study (Chin, 1998; Haenlein & Kaplan, 2004; Kock, 2010). Several preliminary analyses such as confirmatory factor analysis preceded the structural equation modeling analysis in order to validate the measurement instrument (Kline, 1998; Thompson, 2004). The software WarpPLS 3.0 was used to generate estimates for validation of the measurement instrument, confirmatory factor analysis, and the structural equation modeling analysis (Kock, 2010, 2012).

VALIDATION OF THE MEASUREMENT INSTRUMENT

A series of empirical tests were used to examine the measurement properties of the indicators, namely discriminant validity, convergent validity, and reliability. In addition to convergent validity, the measures should also have discriminant validity (Dimovski, 1994). Discriminant validity is defined as the extent to which the measure is novel and not simply a reflection of some other construct or variable (Churchill, 1979). Establishing convergent validity requires examining the significance of the factor loadings (Gerbing and Anderson, 1988). As shown in Table 1, all of the measurement items on the hypotheses loaded on their respective constructs ranging from 0.768 to 0.938, exceeding the recommended threshold of 0.50 (J. F. Hair, Anderson, Tatham, & Black, 1992) and significant at $p < 0.001$, which provides evidence of convergent validity.

Table 1. Combined Loadings and Cross-loadings.

	TRUST	RISK	INT	PEU	PU
TRUST1	(0.839)	0.059	0.142	-0.075	-0.072
TRUST2	(0.807)	-0.083	-0.040	0.074	-0.105
TRUST3	(0.856)	0.048	-0.111	0.098	0.048
TRUST4	(0.876)	-0.027	0.009	-0.092	0.119
RISK1	-0.027	(0.822)	-0.039	0.076	0.110
RISK2	0.024	(0.897)	0.072	-0.017	-0.066
RISK3	0.033	(0.907)	0.009	0.013	-0.122
RISK4	-0.034	(0.858)	-0.047	-0.069	0.093
INT1	0.005	-0.062	(0.901)	0.010	-0.206
INT2	-0.058	0.135	(0.768)	0.053	0.267
INT3	0.044	-0.052	(0.909)	-0.055	-0.021
PEU1	-0.037	-0.031	-0.052	(0.927)	-0.015
PEU2	0.026	0.038	0.030	(0.938)	-0.021
PEU3	0.011	-0.007	0.021	(0.933)	0.036
PU1	-0.010	-0.061	-0.023	0.147	(0.880)
PU2	-0.008	0.018	-0.052	-0.030	(0.934)
PU3	-0.020	0.001	-0.028	-0.125	(0.914)
PU4	0.026	0.028	-0.043	-0.104	(0.921)
PU5	0.013	0.012	0.160	0.130	(0.839)

Notes: Loadings shown in shaded cells, cross-loadings in non-shaded cells; all loadings significant at the P<0.001 level; TRUST = trust; RISK = perceived risk; INT = intention to use; PEU = perceived ease of use; PU = perceived usefulness.

To assess scale reliability, the composite reliability estimates were calculated (Fornell & Larcker, 1981). As shown in Table 2, all measures have a composite reliability greater than the recommended level of 0.7 (Bagozzi and Yi, 1988). In addition to composite reliability, Cronbach's alpha reliabilities ranged from 0.824 to 0.940, exceeding the recommended threshold of 0.7 (Nunnally & Bernstein, 1994).

Table 2. Latent Variable Coefficients.

	TRUST	RISK	INT	PEU	PU
R-squared		0.044	0.447	0.241	0.439
Composite reliability	0.909	0.926	0.896	0.952	0.954
Cronbach's alpha	0.866	0.894	0.824	0.925	0.940
Average variance extracted	0.713	0.759	0.743	0.870	0.807
Q-squared		0.045	0.452	0.242	0.435

Notes: TRUST = trust; RISK = perceived risk; INT = intention to use; PEU = perceived ease of use; PU = perceived usefulness.

Discriminant validity was assessed by comparing the interconstruct correlations with the square roots of the respective average variances extracted (AVEs) shown within parentheses on the diagonal in Table 3. The purpose of the discriminant validity is to examine whether the latent variables are different from each other (Bollen, 1989; Chin, Marcolin, & Newsted, 2003; Fornell & Larcker, 1981). The square roots of AVEs for latent variables are greater than the correlation between latent variables represented in the off-diagonal items in their corresponding columns and rows. The results indicate that the latent variable measures have acceptable discriminant validity (Fornell & Larcker, 1981).

Table 3. Latent Variable Correlations and Square Roots of Average Variances Extracted

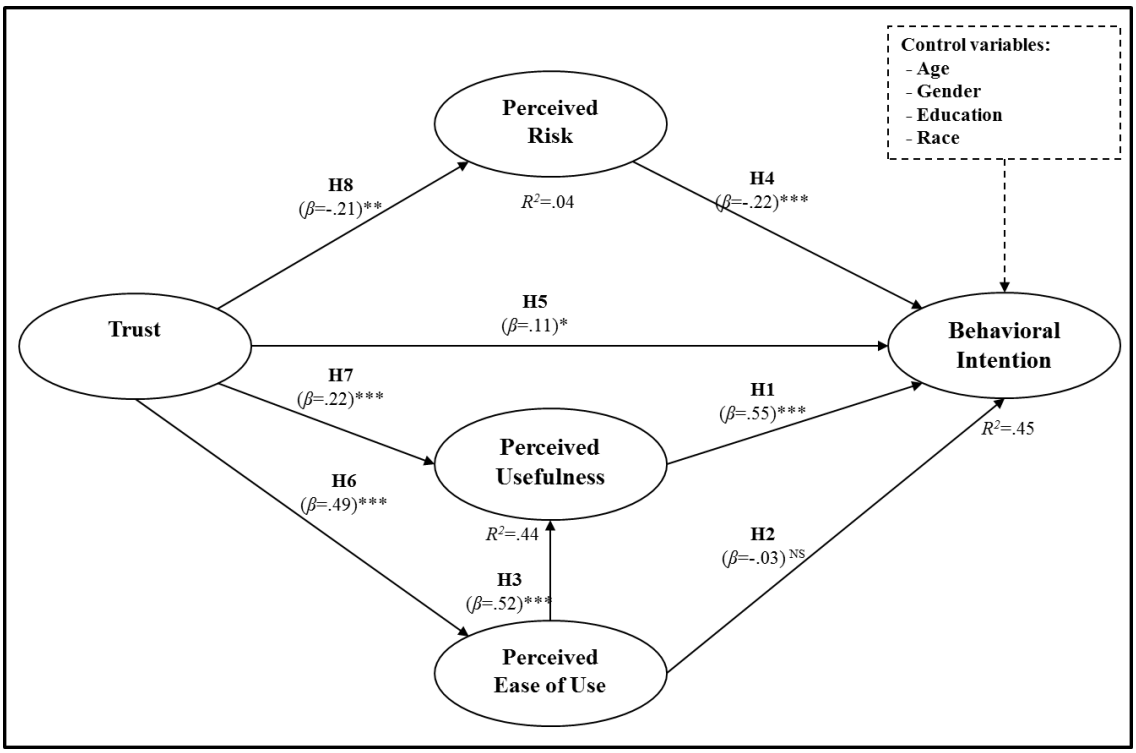
	TRUST	RISK	INT	PEU	PU
TRUST	**(0.845)**	-0.211	0.407	0.491	0.481
RISK	-0.211	**(0.871)**	-0.351	0.004	-0.188
INT	0.407	-0.351	**(0.862)**	0.357	0.613
PEU	0.491	0.004	0.357	**(0.933)**	0.633
PU	0.481	-0.188	0.613	0.633	**(0.898)**

Notes: Square roots of average variances extracted shown on diagonal within parentheses; TRUST = trust; RISK = perceived risk; INT = intention to use; PEU = perceived ease of use; PU = perceived usefulness.

RESULTS

Figure 1 depicts the hypotheses being tested along with their path coefficients. The results show that seven out of the eight proposed hypotheses were supported. Perceived usefulness (H1) (β=.55, p <0.001) had a significant effect on behavioral intention to use personal cloud computing. Although perceived ease of use (H2) (β=-.03, p >0.05) did not have a significant effect on behavioral intention, it did (H3) (β=.52, p <0.001) have a significant effect on perceived usefulness, explaining 44% of the perceived usefulness variance. Perceived risk (H4) (β =-.22, p <0.001) and trust (H5) (β=.11, p <0.05) had significant effects on behavioral intention. Trust had a significant influence on perceived ease of use (H6) (β=.49, p <0.001), perceived usefulness (H7) (β=.22, p <0.001), and perceived risk (H8) (β=-.21, p <0.01). The data show support for all hypotheses except H2, explaining 45% of the intentional behavior variance. Hypothesis 8 was supported, showing that trust (β=-.21, p <0.01) has a significant negative effect on intentional behavior, explaining 4% of the intentional behavior variance. None of the control variables was significant. Support or the lack of support for all hypotheses is shown in Table 5.

Figure 2. Model with Results for Direct Effects and Related Hypotheses.



Notes: * P<0.05; ** P<0.01; *** P<0.001.

DISCUSSION AND CONCLUSION

The objective of this research was to explore technology adoption, risk, and trust factors involved during personal cloud computing use. As hypothesized, it was determined that perceived risk decreased behavioral intention, while trust and perceived usefulness increased behavioral intention. Trust decreased perceived risk and increased behavioral intention, perceived usefulness, and perceived ease of use. Contrary to our hypothesis, perceived ease of use did not affect behavioral intention. The four main independent latent variables, namely perceived trust, perceived risk, usefulness, and ease of use explained 45% of the variance in behavioral intention after considering control variables.

Our findings illuminate how adoption, risk, and trust factors affect personal cloud computing behavioral intention. Most of these findings were similar to those identified in other computer technologies. The interesting finding was how perceived ease of use did not affect behavioral intention. It is possible that intensified risk concerns surrounding personal cloud computing have caused people to be more cautious about using this technology. Thus, it does not matter whether cloud computing is easy to use if the computer technology is perceived as inherently risky. It seems that perceived usefulness trumps perceived ease of use in this situation. People experience greater behavioral intention when cloud computing is seen as useful. If a computer technology is useful, then it is possible that risk is overlooked. The findings of this study have substantial practical implications for the behavioral intention of using personal cloud computing. Personal cloud providers should consider reducing users' risk perceptions by enhancing trust in their offerings. For example, personal cloud providers could develop good reputations in order to increase user trust and decrease the perception of risk (Pavlou, 2003). The current study also has theoretical implications for information systems research on technology adoption. This study introduces a model for user acceptance focusing on the perceived risk of technology and calls for more research comparing risk vs. non-risk types of technologies.

Additional research is needed to determine the difference between perceived ease of use and perceived usefulness on behavioral intention. As suggested, it is possible that risk and trust factors play a role. More research is needed to

determine how different types of technologies with different risk perceptions affect perceived ease of use. It is possible that perceived ease of use of a technology with a lower risk perception would cause positive behavioral intention. Conversely, perceived ease of use of a technology with a higher risk perception may cause negative behavioral intention. Similarly, future research surrounding trust issues is important for determining technology adoption. It is possible that the perceived ease of use surrounding technology that has greater trust may also cause positive behavioral intentions; conversely, perceived ease of use surrounding technology that has lesser trust may cause negative behavioral intentions. It is also possible that risk issues are perceived as more important than trust issues for technology adoption, or vice versa. These issues especially risk and trust issues are growing more complex as technology advances. Other issues such as privacy and security would be interesting factors to explore to determine their role in technology adoption.

REFERENCES

Agarwal, R., & Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly, 24*(4), 665-694.

Antony, S., Lin, Z., & Xu, B. (2006). Determinants of escrow service adoption in consumer-to-consumer online auction market: an experimental study, *Decision Support Systems 42*(3), 1889– 1900.

Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science, 16*(1), 74-94.

Bauer, R. A. (1960). *Consumer Behavior as Risk Taking.* Paper presented at the 43rd Conference of the American Marketing Association, Chicago.

Behrend, T. S., Wiebe, E. N., London, J. E., & Johnson, E. C. (2011). Cloud computing adoption and usage in community colleges. *Behaviour & Information Technology, 30*(2), 231-240.

Bollen, K. (1989). *Structure equations with latent variables*. New York: Wiley.

Brender, N. & Markov, I. (2013). Risk perception and risk management in cloud computing. *International Journal of Information Management, 33*(5), 726-733.

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly, 22*(1), vii-xvi.

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189-217.

Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of marketing research, 16*(1), 64-73.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technologies. *MIS Quarterly, 13*(3), 319-340.

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies, 38*(3), 475-487.

Davis, F. D., Bagozzi, R., & Warshaw, P. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science, 35*(8), 982-1003.

Davis, F. D., Bagozzi, R., & Warshaw, P. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology 22*(14), 1111-1132.

Dimovski, V. (1994). *Organizational learning and competitive advantage.* PhD thesis. Cleveland.

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International Journal of Human-Computer Studies, 59*(4), 451-474.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems, 4*(7), 1-70.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: an integrated model. *MIS Quaterly, 27*(1), 51-90.

Gerbing, D. W., & Anderson, J. C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing research, 25*(2), 186-192.

Gupta, P., Seetharaman, A., & Raj, R. J. (2013). The usage and adoption of cloud computing by small and medium businesses, *International Journal of Information Management, 33*(5), 861-874.

Haenlein, M., & Kaplan, A. M. (2004). A beginner's guide to partial least squares analysis. *Understanding statistics, 3*(4), 283-297.

Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis*. Upper Saddle River, N.J.; London: Pearson.
Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis with readings*. New York: MacMillan.
Hanks, C. (2009). *Technology and Values: Essential Readings.* Hoboken, NJ: Wiley & Sons.
Horst, M., Kuttschreuter, M., & Gutteling, J. M. (2007). Perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in The Netherlands. *Computers in Human Behavior, 23*(4), 1838-1852.
Huang, J. & Nicol, D. M. (2013). Trust mechanisms for cloud computing. *Journal of Cloud Computing, 2*(9). Retrieved from: http://link.springer.com/article/10.1186%2F2192-113X-2-9/fulltext.html.
Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision support systems, 44*(2), 544-564.
Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York, NY: The Guilford Press.
Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: Guilford Press.
Ko, R. K., Jagadpramana, P., Mowbray, M., Pearson, S., Kirchberg, M., Liang, Q., & Lee, B. S. (2011). TrustCloud: A framework for accountability and trust in cloud computing. In *Services (SERVICES), 2011 IEEE World Congress on* (pp. 584-588). IEEE.
Kock, N. (2010). Using WarpPLS in e-collaboration studies: An overview of five main analysis steps. *International Journal of e-Collaboration, 6*(4), 1-11.
Kock, N. (2012). *WarpPLS 3.0 User Manual*. Laredo, TX: ScriptWarp Systems.
Kuyoro, S. O., Ibikunie, F. & Awodele, O. (2011). Cloud computing security issues and challenges. *Internatoinal Journal of Computer Networks, 3*(5), 247-255.
Lee, J. & Song, C. (2013). Effects of trust and perceived risk on user acceptance of a new technology service. *Social Behavior and Personality, 41*(4), 587-598.
Lin, A., & Chen, N.-C. (2012). Cloud computing as an innovation: Percepetion, attitude, and adoption. *International Journal of Information Management, 32*(6), 533-540.
Moqbel, M. (2012). Understanding workplace adoption of social networking sites: Employers' perspective. *Studies in Business and Economics, 16*(2), 37-54.
Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York, NY: McGraw Hill.
Pavlou, P. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce, 7*(3), 101-134.
Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly, 31*(4), 623-656.
Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*. Mahwah, N.J.: Lawrence Erlbaum Associates.
Srivastava, R. K. (2013). The role of trust and technology acceptance model (TAM) on customer acceptance of mobile banking: an integrated model to improve mobile banking in banking sector - a conceptual paper. *International Journal of Asian Business and Informaton Management, 4*(1), 31-43.
Takabi, H., Joshi, J. B. D.,& Gail-Joon,A (2010). Security and Privacy Challenges in Cloud Computing Environments. *Security & Privacy, IEEE, 8*(6), 24-31.
Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications.* Washington, D.C: American Psychological Association.
Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research, 11*(4), 342-365.
Venkatesh, V. & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, *Management Science, 46*(2), 186-205.
Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24*(1), 115-139.
Venkatesh V. & Bala, H. (2008). Technology acceptance model 3 and a research agenda on intervntions. *Decision Sciences, 39*(2), 273-315.
Venkatesh, A., Dunkle, D. E., & Wortman, A. (2011). "Evolving Patterns of Household Computer Use: 1999 – 2010. UC Irvine: Center for Research on Information Technology and Organizations. Retrieved from http://escholarship.org/uc/item/87s3g3wd
Wu, J. H., & Wang, S. C. (2005). What drives mobile commerce?: An empirical evaluation of the revised technology acceptance model. *Information & Management, 42*(5), 719-729.
Yang, H. & Yoo, Y. (2004). It's all about attitude: revisiting the technology acceptance model. *Decision Support Systems, 38*(1), 19-31.