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Mr. Risk! Please Trust Me: Trust Antecedents that Increase Online Consumer Purchase Intention

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Abstract

With the rapid growth of e-commerce, the B2C of e-commerce has been a significant issue. The purpose of this study aims to predict consumers' purchase intentions by integrating trust and perceived risk into the model to empirically examine the impact of key variables. 705 samples were obtained from online users purchasing from e-vendor of Yahoo! Kimo. This study applied the Structural Equation Model to examine consumers' online shopping based on the Technology Acceptance Model (TAM). The results indicate that perceived ease of use (PEOU), perceived usefulness (PU), trust, and perceived risk significantly impact purchase intentions both directly and indirectly. Moreover, trust significantly reduced online consumer perceived risk during online shopping. This study provides evidence of the relationship between consumers' purchase intention, perceived trust and perceived risk to websites of specific e-vendors. Such knowledge may help to inform promotion, designing, and advertising website strategies employed by practitioners.

Keywords: e-Commerce; perceived ease of use; perceived usefulness; trust; perceived risk, purchase intention; e-vendor; Taiwan.

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INTRODUCTION

In the e-commerce world, the development of information technology has a huge effect on the development of more user-friendly designs and securable payment methods for better service. An e-vendor sets up a website that gives information about its products and services, which actually differentiates its store image from others'. For example, online banking provides "transactional" services to assist customers' account assessments, buying products, conducting payment, and tracking service status (Sathye, 1999).

Customers also perceive higher risks when facing e-vendors' efforts for new channels (e.g., Facebook, Twitter, and blogs) to sustain shopping attraction. Thus, trust has a very important role in reducing perceived risks (Dixit and Datta, 2010). However, it is hard to analyze trust in overall online shopping environments or specific retailers because of their complexity.

We are convinced that lack of customer security and technology investment to create an effective and safe shopping area will conspire to make e-vendors "attractive" (Abdulwahed and Yaqoub, 2006). In the hyper-competitive online market for e-vendors, trust will be the decisive factor for the success or failure of e-businesses. E-vendors provide better service in which security and privacy specifically play as the determinate for customers' trust (Karake Shalhoub, 2002a and 2006b). This concern often comes about because of new information technologies that have improved the collection, storage, use, and sharing of personal information. On the other hand, perceived trust and security with specific e-vendors may also determine customers' acceptance and selection for a new vendor.

Security plays a critical role in keeping customers who conduct online purchasing safe from an invasion of their privacy, and this perception actually affects trust and satisfaction (Dixit and Datta, 2010). Violations of security norms may fail customers' trust to specific e-vendors and lead to negative word of mouth that eventually hurts customers' positive attitude to satisfaction.

TrailSightXplorer's marketing investigation (2010) reported that about 60 percent of Taiwanese surfed on the Internet. Moreover, 82.1% of the Taiwanese population is involved in e-commerce. This steady growth of the Internet surfing population accounts for the significance of Taiwan's e-commerce development. Most of online consumers collected product recommendations, comparative price information, and perceived risk data making purchase decisions. These consequences lead to a hyper-competitive environment for current e-vendors.

The Technology Acceptance Model (TAM) indicated that behavioral intentions are significantly predicted by consumers' perceived usefulness (PU) and perceived ease of use (PEOU). TAM still needs more components to explain consumer acceptance of technology and deal with users' captive and voluntary use at workstation (Adams et al., 1992; Lucas and Spittler, 1999). E-vendors need to customize better services to persuade reluctant e-buyers to accept potentially risky technologies or methods (Dixit and Datta, 2010). Since online shopping's interaction and transaction between the business (e-vendor) and consumer (individual buyer) shares similar characteristics with captive and voluntary, researchers suggest TAM application and examining other factors' impact on use intention such as perceived risk and trust (Nicolaou and McKnight, 2006).

The present study therefore integrates trust and perceived risk into TAM and examines the antecedents of trust and perceived risk and their impact on online purchase intention.

LITERATURE REVIEW

E-vendors noted through many studies that although consumer confidence for Internet shopping is getting strong, confidence in specific new payment methods and personal information security was still weak.

This study plans to explore trust and risk components when consumers deal with different e-vendors during their purchase. Gefen, Karahanna, and Straub (2003) indicated that online purchase intentions should be predicted partly by Davis's TAM model (1986, 1989) which has its origins in Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). This theory model was proposed to explain technology adoption and has been frequently applied to website use (Gefen and Straub, 2000).

The Technology Acceptance Model (TAM) suggests that consumers' behavioral intentions are determined by their attitude towards the technology adoption, which is jointly determined by two beliefs: (1) perceived usefulness (PU) and (2) perceived ease of use (PEOU). PU is defined as the individual's perception that using a particular system would enhance or improve job performance. PEOU refers to the individual's

perception that using a particular system would be free of cognitive effort. TAM further proposes that PU is influenced by PEOU and external variables (Davis, 1986).

Despite proposals to modify TAM to exclude attitude variables (Davis, Bagozzi, and Warshaw, 1989; Venkatesh and Davis, 1996, 2000), many researchers still regard attitude as an important factor in predicting users' behavioral intention (Chen and Tan, 2004; Hassanein and Head, 2007; Ha and Stoel, 2009; O'Cass and Fenech, 2003; Pavlou and Fygenson, 2006; Teo, Lee, and Chai, 2008). Researcher further considered the modified TAM to be theoretically fragile due to its concentration on empirical findings (Kim, Chun, and Song, 2009). Thus, it may be necessary to provide additional empirical examination of the TAM's relationship related to consumers' perceived risk and trust within online shopping. Besides, attitude has correlated with experiential consumers' behavioral intention when technology adoption is voluntary (Hassanein and Head, 2007).

We further examine if perceived risk and trust can lead to positive attitude that drives final behavioral outcomes as purchase intentions. Accordingly, this study assumed that consumer attitudes toward online purchases function as mediators between behavioral beliefs and behavioral intentions.

- H1:** PU will positively affect attitude towards online purchase on a business-to-consumer (B2C) Website.
- H2:** PEOU will positively affect attitude towards online purchase on a business-to-consumer (B2C) Website.
- H3:** PEOU will positively affect PU of a business-to-consumer (B2C) Website.
- H4:** Attitude towards online purchase will positively affect purchasing intentions in a business-to-consumer (B2C) Website.

TAM still does not fully reflect the variety of user task environments (Moon and Kim, 2001) and needs to address more perception variables to understand online purchase behavior. Hence, it is reasonable to employ trust and risk perceptions to better understand the nature of e-commerce (Pavlou, 2003). Inherent uncertainty about consumers' purchasing behavior suggests that more research attention is needed on the role that the perception of security plays in the online environment (Gefen, Karahanna, and Straub, 2003).

Even though consumers are getting comfortable on information portal sites such as eBay, Yahoo, Amazon, and Priceline, like eBay, each purchase with a new vendor's website could be a really challenging risk when clicking on the check out button. Therefore, trust becomes a critical factor in research on consumers' online purchase decisions to increase securable perception in e-commerce because there is higher uncertainty and risk degrees in most online transactions that consumers still have not easy to identified with (Benassi, 1999; Fung and Lee, 1999; Pavlou, 2003). Since a low level of trust and a high level of uncertainty may increase consumers' anxiety in online shopping, perceived risk will be treated as an important variable that may affect consumer behavior (Jarvenpaa et al., 2000; Pavlou, 2001; Pavlou, 2003). This research therefore investigated the role that trust and perceived risk play in consumers' online purchases (Mayer and Davis, 1995).

Trust

Trust is identified as a psychological state in which consumers believe in the competence, integrity, and benevolence of the e-vendor, and in the predictability that the e-vendor will meet the obligations of the transaction (Gefen, Karahanna, and Straub, 2003; McKnight and Chervany, 2001; Pavlou, Liang, and Xue, 2007). Online consumers are vulnerable and may expose themselves to loss. Online shopping has greater risk and uncertainty due to credit card fraud, errors with merchandise and other security issues that contribute to consumers' reluctance to purchase (Gefen et al., 2003; Ha and Stoel, 2009; Pavlou, 2003).

Hence, trust building is especially important for e-vendors, as this will enhance consumers' attitudes and purchase intentions (Somali, Gholami, and Clegg, 2009; Alsukkar and Hassan, 2005; Bart, Shandar, Sultan, and Urban, 2005; Corritore, and Kracher, and, Wiedenbeck, 2003; Chen and Tan, 2004; Gefen, Karahanna, and Straub, 2003; Hassanein and Head, 2007).

Trust building reduce consumers' risk perceptions (Bramall, Schoefer, and McKechnie, 2004; Gefen, Benbasat, and Pavlou, 2008; Kim, Ferin, and Rao, 2008; Nicolaou and McKnight, 2006; Pavlou, 2003; Pavlou and Gefen, 2004; Suh and Han, 2002) and reluctance to purchase (Gefen, Benbasat, and Pavlou, 2008; Warkentin, Gefen, Pavlou, and Rose, 2002).

Trust also becomes a predictor of consumer perceived usefulness of a website because it enhances shopping comfort and reduces the perception that e-vendors' websites will engage in harmful and opportunistic behaviors, thus, e-vendors will meet consumer expectations for higher perceived usefulness from the website interface (Pavlou, 2003). Prior empirical evidence introduces trust as an antecedent of perceived usefulness in TAM model within technical system (Gefen et al., 2003; Ha and Stoel, 2009; Pavlou, 2003), as well as consumers' perceived risk (Bramall et al., 2004; Jarvenpaa et al., 2000; Pavlou, 2003; Pavlou and Gefen, 2004), and attitude (Chen and Tan, 2004; Ha and Stoel, 2009; Swan et al., 1999; Suh and Han, 2002). Besides offering services such as face-to-face interaction and discussion of production information (e.g., size, delivery date) which is similar to physical store shopping, a e-vendor's security design (e.g., security seal, phishing prevention, security code, Scam alert, Paypal account) in their online store also kept consumers safe from a privacy invasion, which affected trust and satisfaction for a securable store image (Dixit and Datta, 2010).

Under conditions of limited information, consumers will use website appearance as one heuristic factor to judge trustworthiness of the website (Vance, Elie-Dit-Cosaque, and Straub, 2008). Furthermore, websites that can maximize consumers' searching efficiency and clarify misunderstanding for more smooth purchase transactions drive consumers' perceived ease of use of websites as well as trust to e-vendors (Awad and Ragowsky, 2008).

Thus, we assume that consumers' perceived ease of use will associate with higher levels of trust beliefs (Gefen et al., 2003; Wang and Benbasat, 2007):

H5: Trust will positively affect attitude towards online purchase in a (B2C) Website.

H6: Trust will positively affect PU of a business-to-consumer (B2C) Website.

H7: Trust in the e-vendor will negatively affect perceived risk in an e-vendor.

H8: PEOU will positively affect trust in an e-vendor.

Based on the pivotal role of trust in the online shopping context, several research studies have been done to categorize the antecedents or determinants of online trust (Bramall et al., 2004; Cheung and Lee, 2001; Cheliappa and Pavlou, 2002; Gefen et al., 2003; Lee and Turban, 2001; Warkentin et al., 2002). This research can provide e-business players (participants) with directions for better trust building and risk reduction. Four trust-building mechanisms that are based on having prior experience with a particular e-vendor: calculative-based cognition; knowledge-based familiarity; institution-based trust (situational normality beliefs and institution-based structural assurances (Gefen et al., 2003; McKnight et al., 1998). Our research examines the relationship between the antecedents of trust in a technical shopping environment.

Calculative-Based Cognition

Calculative-based cognition is defined as the economic assumption that consumers will act in their best self-interests using rational calculations that the e-vendor's website will not engage in opportunistic behaviors based on their phobias (Shapiro et al., 1992). According to this calculative-based trust paradigm (Buckley & Casson, 1998; Coleman, 1990; Dasgupta, 1998; Lewicki & Bunker, 1995; Shapiro et al., 1992; Williamson, 1993), consumers' trust will be based on a rational assessment of the costs and benefits of using an e-vendor's website. Since the consumer believes the e-vendor has more to lose than to gain by cheating or breaking trust (Akelof, 1970; Gefen et al., 2003):

H9: Calculative-based cognition will positively affect trust in an e-vendor.

Knowledge-Based Familiarity

Familiarity as a prediction process that consumers can understand what is happening and who is involved in present scenario (Doney et al., 1998). This familiarity reduces social uncertainty and enhances trust with a prior trustworthy party because it provides appropriate context to interpret the behavior of the party (Luhmann, 1979; Kumar, 1996). Online consumers' familiarity occurs when they comprehend the operational procedures of the website and then consumers can predict their prior trust to e-vendor (Gefen, 2000; Gefen et al., 2003).

Consumers' familiarity with a website will drive their patronage and this increased frequency of such patronage will be based partially on positive experience and increased knowledge about the website. Consumers' familiarity also increases their perceived ease of usefulness of the website (Gefen et al., 2003). Therefore, e-vendors' efforts to increase the consumers' familiarity with the websites will contribute to the adoption of special website feature, will speed up the problem-solving process, and lower the mistake rate (Simon & Gilmartin, 1973). This will effectively increase familiarity to specific e-vendors' website and finally leads to their perceived ease of usefulness (Gefen et al., 2003):

H10: Familiarity with a trustworthy e-vendor will positively affect trust in the e-vendor.

H11: Familiarity with the e-vendor will positively affect PEOU.

Institution-Based Situational Normality

According to several studies from Shapiro (1987), Zucker (1986), and Gefen et al. (2003), institution based trust stems from an individual's sense of security that is based on guarantees, safety nets, and other impersonal structures inherent in a specific context. Researchers suggested that situational normality is an assessment of the success of the transaction, and this is based on whether the situation allows for predictability and customization. Situational normality is not specific to the vendors' knowledge but rather to more consumers' actual and problem-free interaction with the vendor to the normal extent (Baier, 1986; Gefen et al., 2003).

Perceived trust disappears when an interaction results in an abnormal expectation (Gefen et al., 2003; Wingreen and Baglione, 2005). Features or services of sites (e.g., timely problem-solving assistance; missing information highlighting) that provide more typical interaction for consumers will increase their trust (Gefen et al., 2003). Consumers will distrust websites with unusual features that cause lower perceived ease of usefulness. It is critical to design a user-friendly website with appearance and features that are typically normal compared to similar sites:

H12: Perceptions of situational normality will positively affect trust in the e-vendor.

H13: Perception of situational normality will positively affect PEOU.

Institution-Based Structural Assurances

Online consumers deal with invisible and intangible uncertainties that may give rise to the perception of risk even we already shop frequently through huge portals such as Amazon, Yahoo, and eBay. Online consumers' uncertainties and perception of risk may also stem from information asymmetry between buyers and sellers, and this can reduce purchasing by consumers (Yang et al., 2007).

E-vendors may design safety nets (e.g., 1800 numbers, Better Business Bureau's BBB online, and TRUSTe seal) for consumers in order to formalize structural assurances of trust. This may prevent consumers from judging e-vendors as opportunistic (Kim, Shin, and Lee, 2009). Those trust-building assurances include various safety features such as legal check recourse, guarantees, approval seals, and explicit privacy policy statements (McKnight et al., 2000). E-vendors' affiliation with respected companies, as well as PAYPAL account and "contact us" clickable icons, can enhance consumer trust (Gefen et al., 2003; Stewart, 1999). Structural assurances are referred as an assessment of success due to safety mechanisms such as legal recourse, guarantees, regulations, or other sources that can deal with specific situation (Gefen et al., 2003; McKnight et al., 1998; Shapiro, 1987; Zucker, 1986).

Multiple security or privacy check mechanisms (e.g., assurance seal; email notification) provided by the e-vendors' websites increase consumers' confidence and provide assurances for continued interaction (Kim et al., 2008; Wingerrn and Baglione, 2005). In short, institution-based structural assurance by the website contributes to a positive relationship and increases consumers' trust in the e-vendor:

H14: Perceptions of institution-based structural assurances built into a website will positively affect trust in the e-vendor.

Perceived Risk

Security perceptions are defined as “the subjective probability” with which consumers believe that their private information will not be viewed, stored and manipulated during transit and storage by inappropriate parties in a manner consistent with their confident expectations (Pavlou, 2001). Perceived risk is identified by the discomfort from consumer through the impersonal interaction and intangible effects that come from operating online (Chen and Mort, 2007; Pavolu, 2003; Pavlou & Gefen, 2004; Warkentin et al., 2002). Consumers fear e-vendors’ opportunistic behavior, such as not delivering the right product at the promised time, outright fraud (Gefen, 2002; Hansen, 2008; Mayer et al., 1995; Pavlou and Gefen, 2004), private information leaks, and misleading advertisements. These risk perceptions may result in a reluctant attitude toward online purchasing (Gefen et al., 2008; Kim et al., 2008). Limiting consumers’ perceived risk will encourage their intent to purchase online.

The theory of Reasoned Action stated that an individual’s expression of a specific behavior is governed by the individual’s behavioral intention, which is determined by attitudes and beliefs (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). In other words, perceived risk drives consumers’ negative attitudes and diminishes their intentions to purchase (Gefen, 2002; Pavlou, 2003; Hansen, 2008; Jarvenpaa et al., 2000; Yang, Park, and Park, 2007). Thus, a negative relationship is expected between perceived risk and purchase intentions (Bramall et al., 2004; Chen and Mort, 2007; Hansen, 2008; Nicolaou and McKnight, 2006; Pavlou, 2003; Pavlou & Gefen, 2004; Warkentin et al., 2002):

H15: Perceived risk regarding the e-vendor will negatively affect attitude towards online purchases regarding a business-to-consumer (B2C) website.

H16: Perceived risk regarding the e-vendor will negatively affect purchase intention in a business-to-consumer (B2C) website.

Based on the research literature review of B2C websites, the research conceptual model is presented as Figure 1.

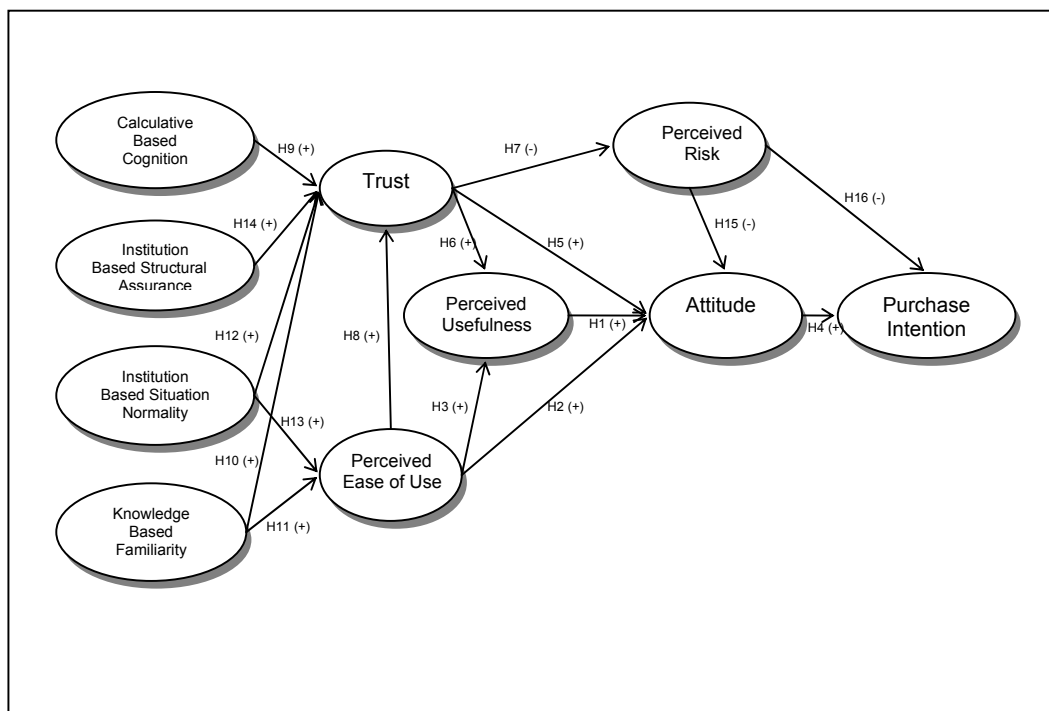


Fig 1: Conceptual Framework

METHODOLOGY

Sample

This study used an extended TAM model to investigate the impact of both trust and risk factors on consumers' attitudes and purchase intentions. A conceptual framework is presented and validated via an empirical survey of experienced online shoppers.

The sampling omitted those who had not yet adopted Internet technology. The online survey was carried out through e-mail invitations with clear descriptions of purpose and it provided incentives in order to obtain a higher valid return rate. Those who received invitations could click the highlighted hyperlink in the e-mail and instantly access the pretested questionnaire of the "MY3Q" website. Respondents were invited to answer the question items related to vendors from website (Yahoo! Kimo). The data were collected from November 1, 2007 to November 30, 2007. There are a total of 705 valid responses. Approximately 33.6% (n=237) of the respondents were male and 66.4% (n=468) were female. There were 454 (64.4%) respondents in the age range of 15 to 24, and 251 (35.6%) from 25 to 34 years old. The majority of the respondents were college students (n=518, 73.5%) with a monthly income less than \$850. 58.2% (n=410) of respondents had online purchasing experience of more than two years. Related to computer usage frequency, and the largest group with Internet use once a month (24.1%, or n=171) and second largest group is once a day (23.8%, or n=168). Respondents' average time spent on a B2C websites is mostly from 30 minutes to an hour (31.8%, or n=224), and from one hour to two hours (31.1%, or n=219). Most of respondents' online purchase frequency in the last year is mostly from one to four times (39.4%, or n=278), and did their online transaction payment through ATM system (54.6%, or n=385). Demographic data from this study represents information of the online population.

Measurement

All the quantitative data analysis was done with AMOS 5 and SPSS 10.1. Structural equation modeling was used for testing hypotheses and causal relationships. We adopted items from previous researches. Primary components of measurement on consumers' purchase intention we integrated trust and perceived risk into the TAM model and revised the model (Gefen et al., 2003). Furthermore, we adopted the measurement items related to consumers' attitude and perceived risk from (Davis, 1989; Davis et al., 1989; Jarvenpaa et al., 2000; Pavlou & Gefen, 2004). Most items were recorded on a seven-point agree-disagree format (1=strongly disagree, 7=strongly agree). In the last step, items were translated into clear and concise Chinese and revised for clarity and appropriateness through pretest procedures.

The measurement items for this model's constructs are introduced as following (please refer to the appendix). There are four aspects to approach trust antecedents. This

research modified items used by Gefen et al., (2003). First, calculative-based cognition was measured based on consumers' beliefs about whether the e-vendor has nothing to gain by being dishonest, uncaring, or unknowledgeable. Second, knowledge-based familiarity was measured as customer familiarity with an e-vendor. Third, institution-based situational normality was measured as consumers' assessments of their typical interaction with an e-vendor. Fourth, institution-based structural assurance was measured as consumers' perceptions of the steps taken by the websites to reassure customers' safety during purchase. To measure consumer trust, we used items on consumers' beliefs in e-vendor's integrity, benevolence, ability, and predictability from (Gefen et al., 2003). Perceived risk was measured as consumers' subjective belief about the likelihood of suffering a loss in pursuit of a desired outcome. These risk items are based on the research.

Perceived usefulness (PU) was measured as the degree to which a person believes that using the B2C Website would enhance his or her job performance. Moreover, Perceived ease of use (PEOU) measures consumers' belief about how easy it is to use the B2C Website. The items to measure PU and PEOU were adopted from Gefen, Karahanna, and Straub (2003). Attitude and purchase intention are related to whether if the website is interesting and consumers are willing to do online purchasing and these items were employed (Jarvenpaa et al., 2000).

RESEARCH FINDINGS

This research model was tested with structural equation modeling. This section included four parts: including descriptive statistics analysis, reliability analysis, validity analysis, and the overall model evaluation. We represent descriptive statistics of the key constructs in Table 1.

Table 1: Descriptive statistics and correlations

Model Variable	Mean	Std. Dev.	Correlations											
			1	2	3	4	5	6	7	8	9	10		
1. CB	4.2	1.4	(0.73)											
2. SN	5.3	0.9	0.17**	(0.71)										
3. SA	4.5	1.1	0.25**	0.23**	(0.79)									
4. FA	4.4	1.1	0.26**	0.16**	0.32**	(0.80)								
5. T	4.9	0.9	0.20**	0.27**	0.44**	0.28**	(0.79)							
6. PEOU	5.4	0.9	0.11**	0.36**	0.36**	0.26**	0.56**	(0.85)						
7. PU	5.3	0.9	0.12**	0.33**	0.33**	0.25**	0.50**	0.72**	(0.80)					
8. PR	2.9	1.3	-0.16**	-0.23**	-0.37**	-0.28**	-0.81**	-0.46**	-0.41**	(0.87)				
9. A	5.2	1.0	0.14**	0.33**	0.34**	0.28**	0.53**	0.60**	0.62**	-0.42**	(0.84)			
10. PI	5.5	1.0	0.07	0.39**	0.22**	0.27**	0.38**	0.54**	0.57**	-0.50**	0.50**	(0.84)		

Note: *, if p<0.05; **, if p<0.01. The bold diagonal values are the square root of the average variance extracted for each construct.

The correlations indicate the internal consistency of each construct. Some correlations are quite high, such as PEOU and trust correlation, PU and trust, trust to attitude and PEOU to purchase intention.

Measurement Reliability and Validity

Structural equation model analysis was conducted on a valid sample of 705 online

users. Many researchers indicated the critical importance of instrument reliability in IS research (Moore & Benbasat, 1991; Straub, et al., 2002). The first stage was to investigate the association and internal consistency of constructs. The composite factor reliability (CFR) values of 0.70 or above is considered to be acceptable as a measure of the internal consistency for constructs (Segars, 1997). Moreover, a construct is considered to be distinctive from other constructs if the square root of the Average Variance Extracted (AVE) from it is greater than its correlations with other latent constructs (Fornell & Larcker, 1981). Table 1 provides acceptable results of discriminant validity between constructs.

The second stage of data analysis focused on measurement validation of constructs. We conducted confirmatory factor analysis (CFA) and specified the links between the latent and manifest variables (Anderson & Gerbing, 1998; William & Hazer, 1986). In Table 2, we can see factor loadings for the measurement model. The criterion for the acceptance level of convergent validity are individual item loadings greater than 0.7 (Fornell & Larcker, 1981). All loadings and weights are statistically significant at $p < 0.01$, with constructs of Cronbach's alpha value well above the cutoff point of 0.70 (Nunnally & Bernstein, 1994). Average variance extracted (AVE) values of constructs across the samples exceeded the threshold of 0.50. This indicates the degree to which constructs have captured a relatively high level of variance (Fornell & Larcker, 1981). Table 2 provides the evidence for this analysis. The composite factor reliability (CFR) of each construct ranges from 0.76 to 0.94, all of which are greater than the acceptable level of 0.70. Moreover, most of the AVE of each construct is greater than 0.70, which indicates the internal consistency of each construct's measurement. The constructs meet tests of internal consistency and convergent validity in our measurement contexts.

Table 2: Measurement items and reliability

Construct/Indicator	Standardized Factor Loading	Construct Reliability (Cronbach's α)	Composite Factor Reliability (CFR)	Average Variance extracted values (AVE)
Calculative-based Cognition (CB)	CB1 0.81	0.78	0.78	0.54
	CB2 0.73			
	CB3 0.67			
Institution-based Structural Assurance (SA)	SA1 0.83	0.84	0.83	0.63
	SA2 0.93			
	SA3 0.57			
Institution-based Structural Normality (SN)	SN1 0.68	0.75	0.76	0.51
	SN2 0.75			
	SN3 0.71			
Knowledge-based Familiarity (FA)	FA1 0.74	0.84	0.84	0.64
	FA2 0.89			
	FA3 0.75			
Trust (T)	T1 0.76	0.88	0.87	0.63
	T2 0.77			
	T3 0.85			
	T4 0.79			
Perceived Ease of Use (PEOU)	PEOU1 0.83	0.94	0.94	0.72
	PEOU2 0.83			
	PEOU3 0.86			
	PEOU4 0.88			
	PEOU5 0.87			
	PEOU6 0.84			
Perceived Usefulness (PU)	PU1 0.80	0.91	0.92	0.64
	PU2 0.86			
	PU3 0.84			
	PU4 0.79			
	PU5 0.81			
	PU6 0.70			

Perceived Risk (PR)	PR1	0.89	0.90	0.90	0.76
	PR2	0.88			
	PR3	0.84			
Attitude (A)	A1	0.76	0.87	0.88	0.70
	A2	0.89			
	A3	0.85			
Purchase Intention (PI)	PI1	0.85	0.93	0.91	0.71
	PI2	0.87			
	PI3	0.90			
	PI4	0.74			

Overall Model Evaluation

The structural model examined the path estimates after analysis of construct reliability and validity. The valid interpretation of model predicted on the soundness of the model fit to the data, which can be examined through a set of fit indices. The χ^2 value and some important fit indices are presented in Figure 2. The χ^2 value (1808.1, $p=0.001$, $df=643$) and χ^2/df statistics (2.81) both indicate that the model fits the sample. Fit simply refers to the model's ability if RMR is close to zero, CFI is less than 0.9, GFI is greater than 0.9. The hypothesized model is considered to be an acceptable fit. GFI (0.88) and AGFI (0.86) are slightly less than standard value (0.90); NFI (0.91) and CFI (0.94) are all greater than 0.90, reaching the acceptable level. PNFI (0.83) and PGFI (0.76) are greater than 0.50. Generally, the overall fit of the proposed model is acceptable. All relationships proposed by the theoretical model were significant except for the path ($p < 0.05$) from institutional-based situation normality to trust. Figure 2 presents the model and structural path coefficients for each relationship.

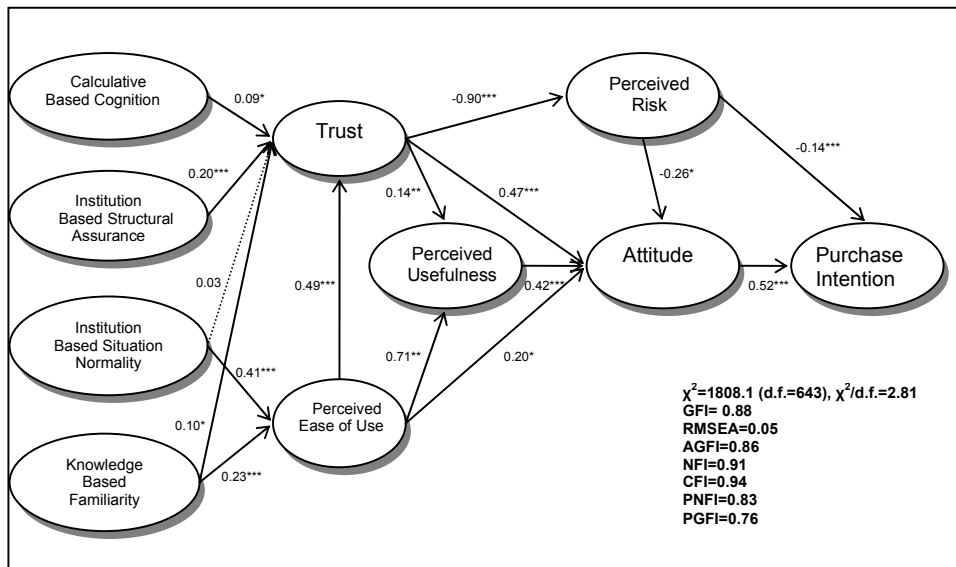


Fig 2: Standardized SEM model

Discussion

Hypothesis 1, which predicts a positive relationship between perceived usefulness and consumer attitude, was supported. Results revealed that the path between these two constructs was indeed positive ($\beta=0.42$, $p < 0.01$). This indicates that B2C e-vendors' efforts to enhance their websites' features to meet consumers' diversified needs effectively increases consumers' PU toward the websites. In turn, this results in more

positive attitudes by consumers. Those features that enhance consumers' information search and purchase evaluation may alleviate consumers' fear of technology adoption and increase PEOU toward the website, leading to more frequent website use. The proposed positive relationship between PEOU and consumer attitude (H2) was also supported ($\beta=0.20$, $p < 0.05$).

The proposed positive relationship between perceived ease of use and perceived usefulness (H3) was also supported ($\beta=0.71$, $p < 0.01$) and fit the results of the TAM model (Davis, 1989). Consumers' PEOU for the adoption of websites' new features will positively increase PU of the e-vendors' websites. More attractive, informative, and user-friendly website layout will enhance consumers' interests in either browsing or shopping. New technology may increase both PU and PEOU that motivate online consumers' comfort to purchase. Since the popularity media of social network marketing on Facebook and Twitter, we may see more connection between consumers product experience and comments through e-vendors' website. A positive attitude toward the e-vendor's website directly sustains consumers' interests to their final purchase intention. Therefore, the proposed positive relationship between consumers' attitudes and purchase intentions (H4) was also supported ($\beta=0.52$, $p < 0.001$).

For trust, H₅ hypothesizes the positive relationship between trust and consumers' attitude ($\beta=0.47$, $p < 0.001$). It is time-consuming to sustain consumer trustful attitude to specific e-vendors' websites as well as switching their channel preference to online, unless online consumers can feel comfort and security. Frequent use for a specific e-vendor's website can predict the degree of consumers' trust. Thus, the proposed positive relationship between trust and perceived usefulness (H6) was supported ($\beta=0.14$, $p < 0.01$). A more useful and informative website increases online consumers' usage which builds up their trust. The respective path coefficient between trust and perceived risk provided support for hypothesis 7 ($\beta=-0.90$, $p < 0.001$). To overcome consumers' risk perception, the implications for management are to focus on building trust, since trust and risk perception might be a reciprocal causation. Lower trust in an e-vendor can increase consumers' risk concern and reduce their purchase attitude to its website. Regarding technological issues, if consumers experience easy loadings when engaged in online browsing or shopping and if they can complete their purchase successfully and efficiently, this can increase the likelihood of continued use. Thus, the proposed positive relationship between trust and perceived ease of use (H8) was supported ($\beta=0.49$, $p < 0.001$).

In addition, the positive relationship between calculated-based cognition and trust (H9) was supported ($\gamma=0.09$, $p < 0.01$). The positive relationship between knowledge-based familiarity and trust (H10) was supported ($\gamma=0.10$, $p < 0.05$). According our studies, these two results meet Gefen et al. (2003)'s results from four trust-building mechanisms and we further explain how calculative-based cognition and knowledge-based familiarity lead to institution-based trust which includes structural assurance beliefs and situational normality beliefs as antecedents to trust. From the result of H9, e-vendors' overall performance to persuade their rational assessments of online transaction and warranty of cheating prevention will alleviate consumer risk perception and enhance trust relationship with reasonable price.

Thus, increasing consumer calculated-based cognition with promotion strategy may sustain mutual familiarity and a trust relationship between e-vendors and consumers. As for H10 and H11, consumers' familiarity with websites actually ensures their prediction of website procedures and creates a scenario that effectively reduces their uncertainty and perceptions of risk. Preventing consumers from feeling of uncertainty and risk with sustaining knowledge-based familiarity actually increases trust between consumer and e-vendor.

Once consumers become involved in a trust relationship with e-vendors, they will be more likely to acquire the technology to master new website features and to adopt the necessary skills for new online purchases. Therefore, consumers' perceived increasing trust in e-vendors, which finally leads to more positive attitudes, more frequent use, and more online purchases, enhances ease of use. On the other hand, e-vendors' efforts to increase efficiency and problem-solving [problem solving](#) in website use not only increases consumers' perceived ease of use and perceived usefulness, but also trust. This study positively predicts the relationship between knowledge-based familiarity and perceived ease of use. Therefore, H10 and H11 are supported ($\gamma=0.10$, $P < 0.05$; $\gamma=0.23$, $p < 0.001$).

In addition, the proposed positive relationship between institutional-based situational normality and perceived ease of use (H13) was supported ($\gamma=0.41$, $p < 0.001$). Institution-based structural assurance and trust are positively related and H14 was supported ($\gamma=0.20$, $p < 0.001$). However, the positive relationship between institutional-based situational normality and trust (H12) was not supported. Consumers may not see institutional-based situation normality as a critical requirement in deciding whether to trust a specific e-vendor and they may just evaluate it base on if they are familiar to operate steps of this e-vendor's website. Therefore, typical operation or process of e-vendors' website may influence perceived ease of use and consumers may adapt it after frequent use. Customizing a stable, user-friendly website with easy-to-confirm designs, such as mail notification or e-receipt, will effectively help to increase the security perception of consumers.

Even though the relationship between situational normality and trust is not significant, institutional-based situational normality truly increases perceived ease of use of a website. Increasing online consumers' shopping confidence by overcoming their risk perception with more assurance services, such as providing legal recourse, guarantees, seals of approval and privacy protection, can increase consumers' structural assurance and enhance trust. Electronic business should concentrate on developing strategies to build trust relationships and easy operation features to meet customers' expectations. Finally, the H15 proposed negative relationship between perceived risk and consumers' attitude to online purchasing was supported ($\gamma=-0.26$, $p < 0.05$). Thus, a negative relationship between perceived risk and purchase intention (H16) was supported ($\beta=-0.14$, $p < 0.001$). This study empirically supports the observation that consumers' perceived risk will negatively affect their attitude toward a specific website and toward purchase intentions. The results from H15 and H16 provide managers with directions on how to reduce consumers' risk perception through IT tools that prevent consumers' reluctance and negative expectations of online purchasing. Figure 2 represents the results of the structural model test.

CONCLUSION

This study tried to understand whether consumers' perceived trust and risk can influence their attitudes and purchase intentions. The empirical results support the proposed hypotheses and the findings are congruent with the TAM model (Davis, 1989). Furthermore, this study empirically demonstrates that trust does influence consumer attitudes and behavioral intentions. Easy-operation websites sustain consumer confidence in online purchasing and in trust. Thus, consumers' trust significantly enhances their perceived usefulness of an e-vendor's website. Generally, this research provides significant evidence between trust and the TAM model and points the way for future online research. E-vendors' efforts to reduce the risk perception of online transactions, by incorporating security and privacy features will win eventual customer loyalty.

There are several research limitations. This study observes the consumer at one point in time, and this may result in measurement errors because of rapid changes in the virtual environment. Longitudinal studies may be needed to measure changes of consumer perceived risk and trust over time and to measure the effect of changes in familiarity with e-vendors' websites. Cross-cultural studies are also needed. In our research, the proposed model testing on website: Yahoo! Kimo is located in Taiwan and the findings may not generalize to other market areas such as European countries or the United States. Future research might also focus on other factors that contribute to risk perception and trust in online purchasing such as advertising and the advice of friends or others.

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APPENDIX

Table: Adopted measurement items definition and source

	Construct	Construct Definition	Item Context	Source of Items
1	Calculative-based Cognition	Calculative-based cognition referred to the calculation made by the consumer that the e-vendor has nothing to gain by being dishonest, uncaring, or unknowledgeable (lacking ability).	<ol style="list-style-type: none"> 1. The online vendor has nothing to gain by being dishonest in its interaction with me. 2. The online vendor has nothing to gain by not caring about me. 3. The online vendor has nothing to gain by not being knowledgeable when helping me. 	Gefen, Karahanna, and Straub (2003).
2	Knowledge-based Familiarity	Knowledge-based Familiarity refers to customer familiarity with an e-vendor	<ol style="list-style-type: none"> 1. I am familiar with the online vendor through reading product articles or ads. 2. I am familiar with the online vendor through visiting the site and searching for products. 3. I am familiar with the online vendor through purchasing products at this site. 	Gefen, Karahanna, and Straub (2003).

3	Institution-based Situational Normality	Situational Normality refers to an assessment that the interaction is typical of that type of e-vendor.	<ol style="list-style-type: none"> 1. The steps required to search for and order a product are typical of other similar websites. 2. The information requested of me at this website is the type of information most similar type of websites request. 3. The nature of the interaction with the website is typical of other similar type Web sites. 	Gefen, Karahanna, and Straub (2003).
4	Institution-based Structural Assurances	Some of the typical steps taken by many Web sites to reassure their customers that the interaction is safe.	<ol style="list-style-type: none"> 1. I feel safe conducting business with the online vendor because the assurance seal provided by the third party will protect me. 2. I feel safe conducting business with the online vendor because of it provides an assurance seal. 3. I feel safe conducting business with the online vendor because of its statements of guarantees. 4. I feel safe conducting business with the online vendor because I accessed its site through a well-known, reputable portal. 	Gefen, Karahanna, and Straub (2003).
5	Perceived Ease of Use	The degree to which a person believes that using B2C Web site would be free of effort.	<ol style="list-style-type: none"> 1. The Web site is easy to use. 2. It is easy to become skillful at using the Web site. 3. Learning to operate the web site is easy. 4. The Web site is flexible to interact with. 5. My interaction with the Web site is clear and understandable. 6. It is easy to interact with the Web site. 	Gefen, Karahanna, and Straub (2003).
6	Perceived Usefulness	Perceived ease of use refers to the degree to which a person believes that using the B2C Web site would enhance his or her job performance	<ol style="list-style-type: none"> 1. The Web site is useful for searching and buying products. 2. The Web sit improves my performance in product searching and buying. 3. The Web sit enables me to search and buy products faster. 4. The Web site enhances my effectiveness in products searching and buying. 5. The Web site makes it easier to search for and purchase products. 6. The Web site increases my productivity in searching and purchasing products. 	Gefen, Karahanna, and Straub (2003)
7	Trust	Specific beliefs of consumers in the e-vendor's integrity, benevolence, ability, and predictability.	<ol style="list-style-type: none"> 1. Based on my experience with the online vendor in the past, I know it is honest. 2. Based on my experience with the online vendor in the past, I know it cares about customers. 3. Based on m experience with the online vendor in the past, I know it is not opportunistic. 4. Based on my experience with the online vendor in the past, I know it provides good service. 5. Based on my experience with the online vendor in the past, I know it is predictable. 6. Based on my experience with the online vendor in the past, I know it is trustworthy. 7. Based on my experience with the online vendor in the past, I know it knows its market. 	Gefen, Karahanna, and Straub (2003)
8	Perceived Risk	Subjective belief of consumers that there is certain probability of suffering a loss in pursuit a desired outcome.	<ol style="list-style-type: none"> 1. There is a considerable risk involved in participating in Yahoo!Kimo auctions. 2. There is a high potential for loss involved in participating in Yahoo!Kimo actions. 3. My decision to participate in Yahoo!Kimo auctions is risky. 	Pavlou & Gefen. 2004.

9	Attitude	Idea of consumers that online purchase is interesting.	<ol style="list-style-type: none"> 1. The idea of using the Internet to shop from Yahoo!Kimo is appealing. 2. I like the idea of using the Internet to shop from Yahoo!Kimo. 3. Using the Internet to shop from Yahoo!Kimo is a good idea. 	Jarvenpaa et al. 2000.
10	Purchase Intention	Willingness of consumer to online purchase.	<ol style="list-style-type: none"> 1. How likely is it that you would return to Yahoo!Kimo? 2. How likely is that you would consider purchasing from Yahoo!Kimo in the next 3 months? 3. How likely is that you would consider purchasing from Yahoo!Kimo in the next year? 4. For this purchase, how likely is it that you buy from Yahoo!Kimo. 	Jarvenpaa et al. 2000.