Identifying the Factors that Affect Consumers' Willingness to Do Internet Shopping

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ABSTRACT

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Jing Ou Shu

Electronic commerce, especially conducted via Internet, is growing at a phenomenal rate. Online sales would exceed $72 billion by 2003.

Despite recent successes in electronic commerce, one of the major problems against fully combining the Internet-based electronic commerce with modern business is the lack of Internet consumers' trust in the newly developed marketing machinery. Moving Internet users along to the purchase is proving to be difficult because Internet shopping as a non-store retailing entails higher risk than traditional store.

Previous research on business to consumer (B2C) electronic commerce over the Internet and virtual shopping is often theoretical, ad hoc, and incomplete. The empirical study is relatively rare. This empirical research tries to identify the factors that affect consumers' willingness to do Internet shopping.

The study findings suggest that trust in Internet shopping, perceived usefulness and perceived security directly and positively influences on consumers' willingness to do Internet shopping; perceived security, perceived ease of use, service quality and information quality indirectly and positively affects on consumers' willingness to do Internet shopping.

Future research considerations and limitations of this research are also mentioned.

ACKNOWLEDGEMENTS

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I would also like to extend my special thanks to Dr. Bayne and Dr. Nebebe, whose support was greatly appreciated.

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Introduction

Electronic commerce, especially conducted via the Internet and World Wide Web, is growing at a phenomenal rate. Everyday thousands of Internet users and shoppers are joining the ranks of the digitally connected business world. According to recent surveys (Brown & Sellen, 2001), over 60% of the U.S. population browse the web. Internet use is still increasing worldwide, especially in the non-English speaking world (Mariano, 2001). The Direct Marketing Association (DMA) forecasted that online sales would exceed $72 billion by 2003 (Culnan, 1999).

An increasing number and variety of companies are creating and developing business opportunities on the Internet. The Internet can be used to provide a lot of merchandise and services for their customers. The Internet is changing retail and direct marketing.

Internet shopping is becoming an well-accepted way to purchase a wide range of products and services. Consumers can buy computer products, automobiles, travel products, investment products, clothing, flowers, books and music at home from producers and retailers all over the world. The Internet has changed modern business and created a new model of business relationships and transactions. The advantages of using the Internet for business to consumer transactions are very clear.

Internet-based electronic marketplaces apply information technology in establishing a direct link between buyers and sellers with increased convenience and lower transaction costs.

Despite recent successes in utilizing the Internet, one of the major problems against fully combining the Internet-based electronic marketplaces with modern business is the lack of Internet consumers' trust in the newly developed marketing machinery (Campbell, 1997). The most important issue that Internet consumers have identified is fear and distrust regarding loss of personal privacy and transaction security associated with the rising electronic commerce marketplace. One third of European business identified concerns over transactional security, safety and trustworthiness as the principal obstacles to conducting more business over the Internet with suppliers, according to a recent survey conducted by Pricewaterhousecoopers (Anonymous, 2001).

Business to consumer (B2C) electronic commerce over the Internet (also called online shopping or Internet shopping) is still in its early stage. According to recent studies (Leone, 2002): It's projected that there will be only one-third online shoppers compared to one billion Internet user populations all over the world by 2005. Moving Internet users along to the purchase is proving to be difficult because Internet shopping as a non-store retailing entails higher risk than traditional store (McCorkle, 1996).

Previous research has been published on business to consumer (B2C) electronic commerce over the Internet and virtual shopping. The available literature on this issue is often theoretical, ad hoc, and incomplete. The empirical study is relatively rare.

One recent study undertaken by Liao and Cheung (2001) shows that transaction security, price, vendor quality, shopping experience, IT education and Internet usage significantly affect consumers' willingness to do Internet-based e-shopping.

In order for companies to take advantage of Internet shopping, there is an urgent need for further research to understand the factors that entice consumers to use Internet for shopping. This research tries to identify and empirically test these factors.

Based on an extensive literature review, I choose the following factors (Independent variables) that affect consumers' willingness to do Internet shopping (Dependent variables): trust in Internet shopping, perceived playfulness, perceived privacy and security, information quality, service quality, perceived usefulness and ease of use.

Although the concept of consumers' willingness (intention) to do Internet shopping is not equal to consumers' actual purchase, consumer acceptance and

use of virtual store can be predicted reasonably well from their intention (Chen et al, 2002).

Literature Review

B2C electronic commerce over the Internet is an information technology that organizations utilize to do business. Its adoption and use can be explained by the Technology Acceptance Model (TAM) (Davis, 1989). Recent study has used TAM and extensions to explain web site use (Moon and Kim, 2001). Consumers' willingness to do Internet shopping is defined as the consumers' likelihood to use Internet for shopping (Chen et al, 2001).

Trust in Internet Shopping

Trust has been one of the most important issues in electronic commerce. As electronic commerce develops and matures, its success will depend largely on gaining and maintaining consumers' trust toward Internet vendors. This will be extremely important to sites that depend on consumer commerce (Cheskin Research, 1999). Several studies have identified trust as a major factor for consumers to buy online. In the marketing field, trust is one of the important concepts and defined in terms of consumers' confidence in company (Garbarino and Johnson, 1999). Trust is also fast becoming the focus of many IS research initiatives (Papadopoulou et al, 2001). Trust in Business to Consumer (B2C) electronic commerce is defined as 'consumers' willingness to be vulnerable to the electronic commerce actions on the expectation that electronic commerce will perform a particular action important to the customer' (Kim, 2001). Quelch and Klein (1996) think that trust is a key factor in stimulating purchases online in the early stages of the Internet development. Gefen (2000) concludes that trust

strongly influences on consumers' intention to purchase. Trust is a key issue for the successful proliferation of electronic commerce.

Perceived Security & Perceived Privacy

Privacy and security on the Internet has received considerable attention in theory and practice. These have been established as major challenges for Internet shopping (Cheskin research, 1999). Consumers worry about such issues as actual damage, Spam email, financial or time cost, and perceived loss of privacy (Nikander & Karvonen, 2000).

Privacy perceptions are defined as "the subjective probability with which consumers believe that the collection and subsequent access, use, and disclosure of their private information by web retailers is consistent with their expectations" (Pavlou, 2001).

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).

Issues involving security and privacy have made the consumers hesitant to transact online (FTC 1998). According to Business Week (2000), 61% of the

survey respondents would transact over the Internet if the security and privacy of their personal information could be adequately protected.

Information Quality

Information quality problems may occur with information published on the Internet (Hawkins, 1998). The quality of information is determined by the degree to which consumers can use information to predict their satisfaction with product prior to the actual purchase (Chen et al, 2002). The web is a very good source of product information. The quality of information is a major determinant of web site success in the context of electronic commerce (Liu and Arnett, 2000). If consumers do not understand information quality problems, decision-making may be affected (Fuld, Keltner, 1998). Huh et al.(1990) define four dimensions of information quality: accuracy, completeness, consistency, and currency. Wang and Strong (1996) define other dimensions of information quality: timeliness, relevancy, and conciseness.

Perceived Playfulness

Playfulness is a variable defined as 'the degree of cognitive spontaneity in microcomputer interactions' (Webster and Martocchio, 1992). There is a number of theoretical and empirical evidence on the importance of playfulness in technology use (Agarwal and Karahanna, 2000; Davis et al., 1992). Moon and Kim (2001) think playfulness significantly affect user's behavioral intention to use

the WWW. The website must provide more concentration, curiosity, and enjoyment.

Perceived Usefulness & Perceived Ease of Use

What cause people to accept or reject information technology? Previous research (Davis, 1989) introduced TAM for predicting and explaining system use. The model posits that perceived ease of use and perceived usefulness is the primary determinants of system use.

Perceived usefulness is defined as "the degree to which a person believe that using a particular system would enhance his or her job performance." A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive user-performance relationship (Davis, 1989).

Perceived ease of use refers to " the degree to which a person believes that using a particular system would be free of effort." All else being equal, an application perceived to be easier to use than another is more likely to be accepted by users (Davis, 1989).

Many studies have successfully adopted TAM to study the acceptance of Internet related technologies. Using the major components of TAM ------ perceived usefulness and perceived ease of use as the basis for studying consumers' intention to use Internet shopping is a valid approach (Chen et al, 2002).

Service Quality

Previous studies have stressed the importance of providing high quality of service in Internet-based business to consumer electronic commerce. Increased convenience and promptness of purchases, more dedicated after-sales service and value-for-money represent important quality dimensions along which Internet-based B2C electronic commerce can effectively compete. Poor service quality has been identified as a significant disincentive to virtual retailing (Liao and Cheung, 2001).

Research Model

The research model for this study is represented in figure 1. The hypotheses in this research describe the relationships between independent variables and consumer willingness to do Internet shopping (Dependent variable).

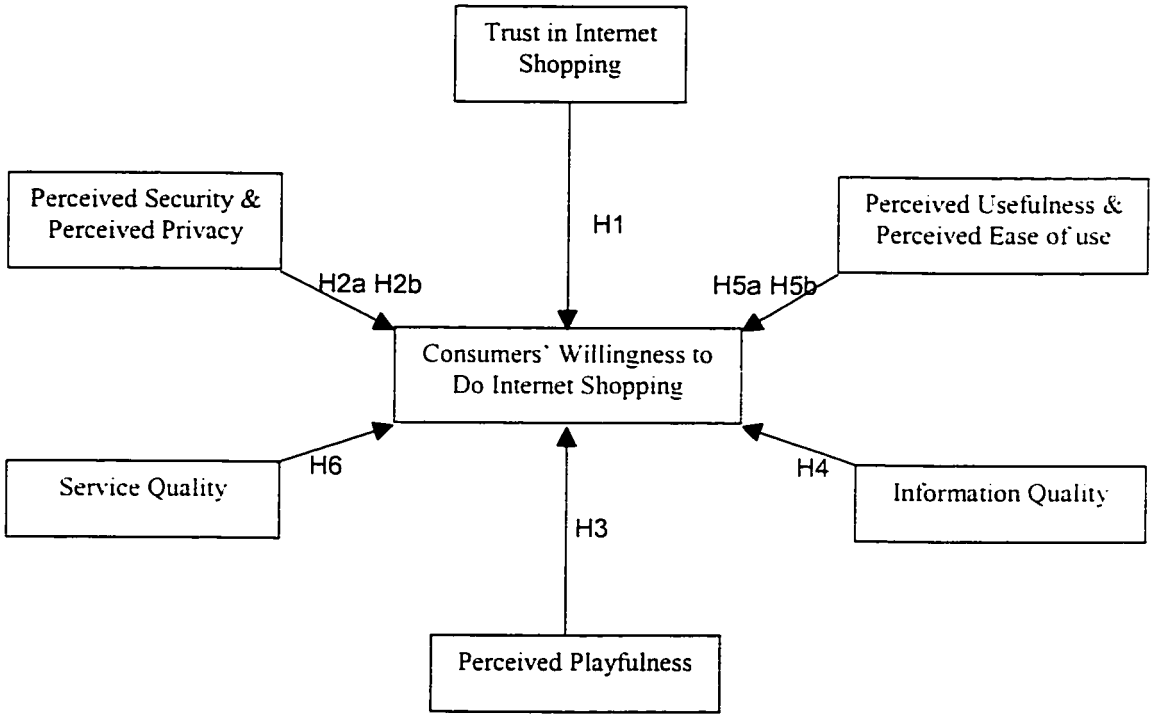


Figure 1. Research model

Hypothesis

Trust in Internet shopping

Trust has been associated with favorable perceptions including increased satisfaction, long-term orientation, and reduced risk (Ganesan, 1994). The open nature of the Internet and technological uncertainty as a transaction medium make online consumers suffer additional risks. Jarvenpaa et al. (2000) shows that trust in an Internet store reduces risks from buying from that store. Gefen (2000) thinks that trust strongly influences on consumers' intention to purchase. I hypothesize:

H1: Trust in Internet shopping is positively associated with consumers' willingness to do Internet shopping.

Perceived privacy and perceived security

Security and privacy concerns discourage Internet transactions and may have a negative effects on Internet shopping. Consumers would not pay for products or services over the Internet if their personal and financial information could not be transmitted securely (Liu and Arnett, 2000). When consumers know about protecting themselves when engaging in online transactions, they will willingly choose Internet shopping. I hypothesize:

H2a: Security perceptions are positively related to consumers' willingness to do Internet shopping.

H2b: Privacy perceptions are positively related to consumers' willingness to do Internet shopping.

Perceived playfulness

According to Moon & Kim (2001), Individuals using the WWW and experiencing playfulness are more absorbed and interested in their interaction. Webster, et al. (1992) shows that playfulness highly correlates with expected voluntary use. A potential satisfied consumers comes not only from an extrinsic reward of purchasing products or services but also from personal and emotional reward from purchasing-related pleasure (Jarvenpaa & Todd, 1997). Thus, Consumers who perceive higher level of playfulness from Internet vendor web sites would show more willingness to use Internet for shopping.

H3: There is a positive relationship between perceived playfulness and consumer' willingness to do Internet shopping.

Information quality

Prior study (Liu & Arnett, 2000) stressed the importance of information quality in user satisfaction of IS system success. The success of Internet vendors lies in its ability to provide consumers with high quality and rich information and products. Consumers make decision about buying products rely on the information provided by Internet vendors (Chen et al, 2002). This leads to the following hypothesis:

H4: Information quality is positively related to consumers' willingness to do Internet shopping.

Perceived usefulness and perceived ease of use

Following TAM (Davis, 1989), Internet shopping as information technology to initiate business transaction over the Internet, its acceptance are also affected by both perceived usefulness and perceived ease of use.

H5a: It is hypothesized that perceived usefulness has positive influence on consumers' willingness to do Internet shopping.

H5b: It is hypothesized that perceived ease of use has positive influence on consumers' willingness to do Internet shopping.

Service quality

The lack of physical presence of the product, and face-to-face contact between the buyer and seller, makes service issue especially important. The services such as variety in the choice of products, ease of placing, altering and canceling orders, and the efficient handling of returns and refunds would make consumers feel convenient and safe about purchasing (Hwang and Thorn, 1999; Karahama and Straub, 1999). Virtual stores with easy navigation and convenient checkout have been found to increase sales (Chen et al, 2002). I propose:

H6: Service quality is positively related to consumers' willingness to do Internet shopping.

Research Methodology

Survey

The survey method was chosen to gather information regarding consumers' willingness to do Internet shopping. The self-report questionnaire included questions measuring the dependent variable of consumers' willingness to do Internet shopping, independent variables of trust in Internet shopping, playfulness, perceived privacy and security, information quality, service quality, perceived usefulness and ease of use.

The research subjects are individual consumers. All of the subjects had prior experience with the use of Internet and WWW.

Measurement Development

Potential measurement items for variables were derived and modified from information system (IS), electronic commerce and marketing literature (Table 1). Table 1 shows the research constructs with the corresponding references. A 5-point Likert-type scale was selected to measure consumer perceptions. Likert scales have several desirable features (Whitley, 1996). First, they are reliable and flexible. Second, it can be used to scale perceptions of people and things. Finally, Likert scaling can assess multidimensional constructs through use of subscales. Although validated by previous research, instrument validation is necessary because it may not be consistent across different contexts. Pre-testing of measures were conducted by 3 students from M.I.S major. The respondents

were asked to rate the completeness, relevancy, clarity and readability of the items. After pre-testing, some items were dropped from variables of perceived ease of use, perceived

Table 1. Research Model Constructs

Construct	Number of items	Reference
Consumers' Willingness to Do Internet Shopping	5	Pavlou (2001, 2 items); Moon & Kim (2001, 1 item); Agarwal & Prasad (1998, 2 items)
Trust in Internet Shopping	5	Pavlou (2001, 4 items); Borchers (2001, 1 item)
Perceived Ease of Use	8	Moon & Kim (2001, 8 items)
Perceived Usefulness	5	Moon & Kim (2001, 2 items); Pavlou (2001, 3 items)
Perceived Playfulness	7	Liu & Arnett (2000, 3 items); Moon & Kim (2001, 4 items)
Perceived Security	5	Borchers (2001, 1 item); Pavlou (2001, 4 items)
Perceived Privacy	5	Pavlou (2001, 3 items); Borchers (2001, 2 items)
Information Quality	6	Klein (2001, 4 items); Liu & Arnett (2000, 2 items)
Service Quality	6	Liu & Arnett (2000, 4 items); Liao & Cheung (2001, 2 items)

usefulness and information quality, others from variables of perceived privacy, trust in Internet shopping were modified to make them readable. To control for response bias, several items were worded negatively.

In order to ensure that the items comprising each proposed research construct are internally consistent, reliability assessment was carried out using Cronbach's alpha.

Data Collection

University students were selected as research participants (Convenience samples) because convenience samples are generally easy to acquire and inexpensive for data collection. However, researcher has no way of knowing the degree to which the members of a convenience sample are representative of general consumers (Whitley, 1996). The generalizability of the results should be cautious. A questionnaire was distributed to 296 university students during class or by email, securing 175 usable and_meaningful responses. The response rate is 59.80%. 5 questionnaires were discarded because of the missing data.

Data Analysis

To determine whether there is relationship between dependent variable and one of independent variables or not, Pearson correlation method was used. Correlation coefficient was calculated to show the degree of relationship between two variables. Multiple regression analysis will be used to derive an equation that quantifies the effects of the identified factors on consumers' willingness to do Internet shopping. Path analysis was used to estimate the strength of relationship between an independent and a dependent variable controlling for the mediating variables.

The results of data analysis are described as follows.

1. Descriptive statistics of the variables

Table 2 provides descriptive statistical information of the variables measure scores.

Table 2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
[illegible]	[illegible]	1.00	[illegible]	[illegible]	[illegible]
[illegible]	175	1.00	1.00	[illegible]	[illegible]
[illegible]	175	1.66	1.00	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1.00	1.00	[illegible]	[illegible]
[illegible]	175	1.00	1.00	[illegible]	[illegible]
[illegible]	175	1.00	1.00	[illegible]	[illegible]
[illegible]	175				

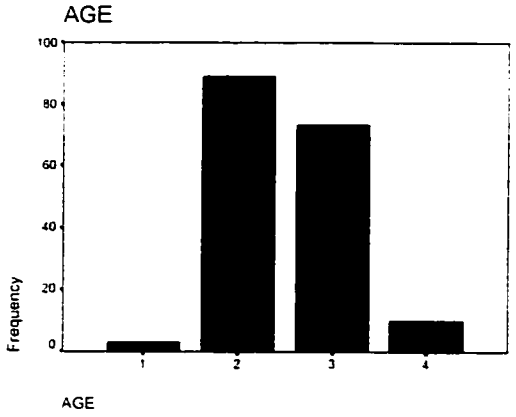
2. The characteristics of respondents.

A descriptive statistical analysis was employed to present the respondents' general information. Bar charts and pie charts were used to display the frequency results.

Figure 2 shows that 50.9% of the respondents of the survey are between 20 and 30. 41.7% of the respondents are between 31 and 40. 5.7% of the respondents are above 40. Very small number of the respondents (1.7%) are below 20. The participant samples are restricted to young adults. The restricted sampling may limit the results.

Table 3. Frequency table for respondents' age

Age	Frequency	Percent	Cumulative Percent
Below 20	3	1.7	1.7
20 ~ 30	89	50.9	52.6
31 ~ 40	73	41.7	94.3
Above 40	10	5.7	100.0
Total	175	100.0	



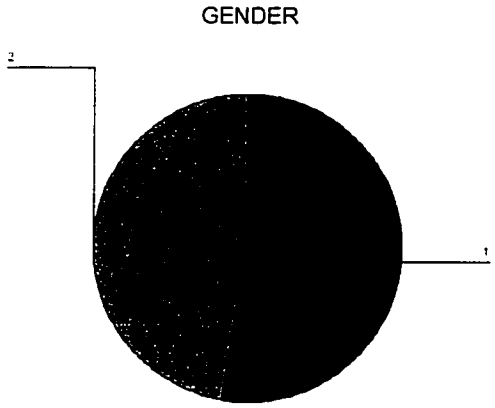
* 1. Below 20; 2. 20 – 30; 3. 31 – 40; 4. Above 40

Figure 2. Bar chart for age

Figure 3 displays that 52.6% of the respondents are male. 47.4% of the respondents are female. It represented a balanced proportion.

Table 4. Frequency table for respondents' gender

Gender	Frequency	Percent	Cumulative Percent
Male	92	52.6	52.6
Female	83	47.4	100.0
Total	175	100.0	



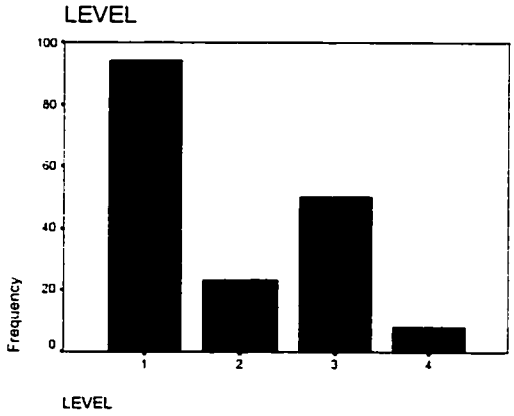
* 1. Male; 2. Female;

Figure 3. Pie chart for gender

Figure 4 presents a frequency histogram of the level of study for university students. Most of them (53.7%) are undergraduate students. Secondly (28.6%) are Master students. Graduate diploma students and Ph.D. students are 13.1% and 4.6%, respectively.

Table 5. Frequency table for level of study

Level of study	Frequency	Percent	Cumulative Percent
Undergraduate	94	53.7	53.7
Graduate diploma	23	13.1	66.9
Master	50	28.6	95.4
Ph.D.	8	4.6	100.0
Total	175	100.0	



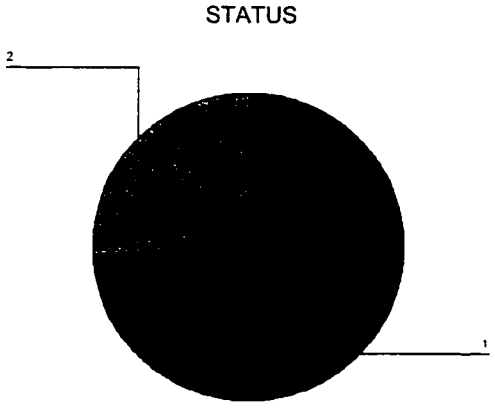
* 1. Undergraduate; 2. Graduate diploma; 3. Master; 4. Ph.D.

Figure 4. Bar chart for level of study

Figure 5 displays that majority of the respondents (74.3%) are full time students. Part time students make up 25.7% of the respondents.

Table 6. Frequency table for full/part time status

Full/Part time status	Frequency	Percent	Cumulative Percent
Full time	130	74.3	74.3
Part time	45	25.7	100.0
Total	175	100.0	



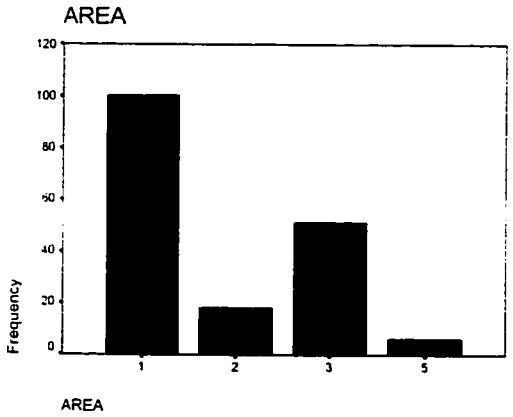
* 1. Full time; 2. Part time

Figure 5. Pie chart for full/part time status

Figure 6 shows that most of the respondents are commerce students (57.1%), and computer science and engineering students (29.1%). Internet shopping is a combination of computer technology and traditional business. A large proportion of commerce and computer science students is unrepresentative of target population. It may be difficult to generalize the results across general consumers.

Table 7. Frequency table for area of study

Area of study	Frequency	Percent	Cumulative Percent
Commerce & Administration	100	57.1	57.1
Arts & Science	18	10.3	67.3
Engineering & Computer Science	51	29.1	96.6
Fine Arts	0	0	96.6
Other	6	3.4	100.0
Total	175	100.0	



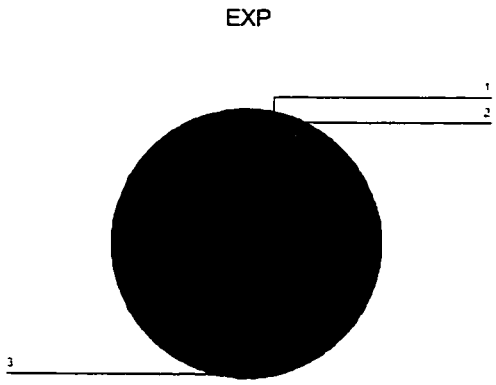
1. Commerce & Administration; 2. Arts & Science;
3. Engineering & Computer science; 5. Other

Figure 6. Bar chart for area of study

Figure 7 reports that majority of the respondents (92.6%) have more than 1 years' experience working with the Internet. Very few of the respondents (7.4%) are Internet beginners. This participant sample has more experiences working with the Internet than general consumers. This could lead to differences in response.

Table 8. Frequency table for Internet experience

Internet experience	Frequency	Percent	Cumulative Percent
1 ~ 6 months	11	6.3	6.3
7 ~ 12 months	2	1.1	7.4
Above 1 year	162	92.6	100.0
Total	175	100.0	



* 1. 1 – 6 months; 2. 7 – 12 months; 3. Above 1 year

Figure 7. Pie chart for Internet experience

3. Reliability analysis for measurement items

The internal consistency was assessed by using Cronbach's Alpha. Items were deleted from the set of items if they obviously lowered the Alpha value (Soloman, 1998). The Alpha values range from 0.6336 to 0.8627 after item deletion. They are all above 0.60, which has been suggested as a widely used rule of thumb by Nunnally (Nunnally, 1978). One variable has marginal Alpha value (0.6336).

Table 9 reports the results of reliability analysis.

Table 9. Reliability Analysis Results

Construct name	Cronbach's Alpha (α) coefficient After item deletion
Consumers' Willingness to Do Internet Shopping	0.8608 5 items (5 items before deletion)
Trust in Internet Shopping	0.7885 4 items (5 items before deletion)
Perceived Ease of Use	0.8273 7 items (8 items before deletion)
Perceived Usefulness	0.6336 3 items (5 items before deletion)
Perceived Playfulness	0.8247 7 items (7 items before deletion)
Perceived Security	0.8627 5 items (5 items before deletion)
Perceived Privacy	0.8440 5 items (5 items before deletion)
Information Quality	0.7691 6 items (6 items before deletion)
Service Quality	0.7757 6 items (6 items before deletion)

4. Factor analysis for construct validity of measurement

To test construct validity, a confirmatory factor analysis was performed with varimax rotation. All measurement items were input for factor analysis except consumers' willingness to do Internet shopping.

To validate appropriateness of factor analysis, Bartlett's test of sphericity and Kaiser-Meyer-Olkin measure of sampling adequacy were calculated. Bartlett's test rejected the hypothesis that there was no correlation among study variables ($p < 0.000$). Table 10 shows the result of Kaiser-Meyer-Olkin measure of sampling adequacy. Kaiser has characterized a value of 0.799 as being middling (George & Mallery, 1999).

Table 10.

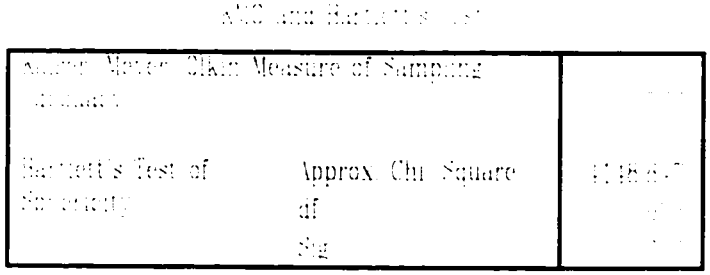


Table 11, 12 and figure 8 represents the results of factor analysis. 8 factors with eigenvalue larger than 1 after varimax rotation were extracted, which account for approximately 61.2 % of common variance. The entire factor loadings are fairly

high. Most items exhibited loading higher than 0.50 on their respective factors, signifying desirable measurement convergent validity (Chau & Hu, 2002). The only exceptions were Ease7 and Service1, whose loadings were slightly below 0.5 (but higher than 0.40). These results show that these constructs are distinct uni-dimensional scales.

Table 11. Extraction Sum of Squared of Loadings

Components	Eigenvalues	Percent of Variance (%)	Cumulative Variance (%)
1	9.694	22.545	22.545
2	4.798	11.159	33.704
3	2.719	6.323	40.027
4	2.434	5.662	45.688
5	1.987	4.621	50.309
6	1.652	3.842	54.151
7	1.535	3.569	57.720
8	1.506	3.503	61.224

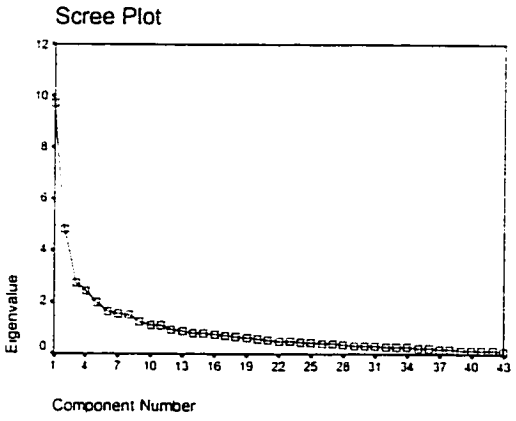


Figure 8. Scree plot for factor analysis

Table 12. Rotated Component Matrix

Scale items	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Privacy2	0.824							
Privacy1	0.761							
Privacy5	0.728							
Privacy4	0.711							
Privacy3	0.624							
Ease3		0.835						
Ease2		0.782						
Ease5		0.782						
Ease4		0.670						
Ease1		0.555						
Ease8		0.547						
Ease7		0.443						
Playful2			0.724					
Playful5			0.706					
Playful4			0.683					
Playful6			0.619					
Playful3			0.610					
Playful7			0.596					
Playful1			0.590					
Secure1				0.784				
Secure3				0.758				
Secure2				0.694				
Secure5				0.527				
Secure4				0.510				
Trust1					0.653			
Trust3					0.625			
Trust4					0.625			
Trust2					0.620			
Quality4						0.690		
Quality2						0.672		
Quality6						0.646		
Quality3						0.575		
Quality5						0.557		
Quality1						0.515		
Service3							0.724	
Service4							0.699	
Service5							0.688	
Service2							0.606	
Service6							0.563	

Table 11 (continued)

Service1							0.447	
Useful2								0.725
Useful3								0.617
Useful1								0.544

5. Hypothesis testing

A correlation coefficient is a measure of the linear relationship between two quantitative variables. The Pearson correlation coefficient (r) measures the strength of linear relationship between consumers' willingness to do Internet shopping and independent variables.

Table 13 and figure 9 presents the results of the Pearson correlation tests.

Table 13. Correlation Test Results

Variable	**Pearson Correlation Test**	**Sig. (2-tailed)**
TRUST	0.656**	0.000
EASE	0.199**	0.008
USEFUL	0.565**	0.000
PLLAFUL	0.450**	0.000
SECURE	0.497**	0.000
PRIVACY	0.290**	0.000
QUALITY	0.318**	0.000
SERVICE	0.365**	0.000

** Correlation is significant at the level of 0.01

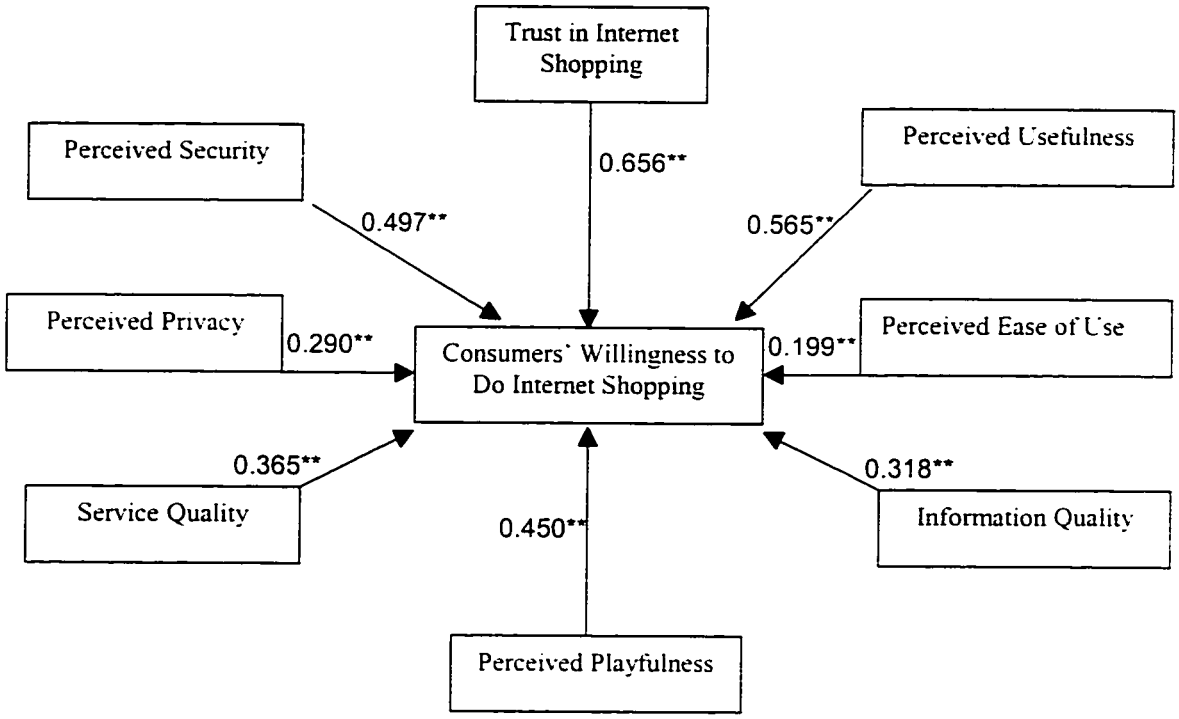


Figure 9. Graphic representation of correlation coefficient

The results show that consumers' willingness to do Internet shopping correlated positively and significantly with trust in Internet shopping, perceived ease of use, perceived usefulness, perceived playfulness, perceived security, perceived privacy, information quality, and service level at the 0.01 level ($p < 0.01$). Therefore, research hypothesis H1-H6 can be supported.

In addition, the results also show that trust in Internet shopping, perceived usefulness and perceived security are more related to consumers' willingness to do Internet shopping than other variables. In other words, the magnitude of the

relationship between dependent variable and trust in Internet shopping, perceived usefulness, perceived security is very high in our sample, we could predict dependent variable based on these three variables.

6. Multiple linear regression analysis

Multiple regression analysis was used to predict the effects on consumers' willingness to do Internet shopping from a set of factors (Whitley, 1996).

The analysis of variance was displayed in Table 14.

Table 14. ANOVA table for multiple linear regression

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	61.272	8	7.659	26.756	.000
Residual	47.317	166	.286		
Total	108.589	174			

The F value of 26.756 ($p < 0.001$) indicates a significant relationship between dependent variable, and at least one of the independent variables (trust, security and perceived usefulness). The R square value indicates that the model accounts for 56.3% the variation in consumers' willingness to do Internet shopping.

Table 15. R square analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750[a]	.563	.542	[illegible]

a. Predictors: (Constant), SERVICE, EASE, PRIVACY, SKILL, [illegible], QUALITY, TRUST, [illegible]

b. Dependent Variable: [illegible]

The parameter estimates (table 16) provides the calculated t values and associated p values. P values for Trust, Usefulness, Security is less than 0.05, the parameter estimates are significant at the 0.05 level.

Table 16. Results of multiple regression coefficients

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.129	.369		[illegible]	[illegible]
[illegible]	.191	.081	.116	[illegible]	[illegible]
[illegible]	7.[illegible]E-02	.07[illegible]	.06[illegible]	[illegible]	[illegible]
[illegible]	.112	.068	.106	[illegible]	[illegible]
[illegible]	9.692E-02	.089	.069	[illegible]	.278
[illegible]	.1[illegible]	.070	.140	[illegible]	[illegible]
PRIVACY	-2.261E-02	.071	.019	[illegible]	.749
QUALITY	-1.296E-02	.096	.008	[illegible]	.892
[illegible]	5.492E-02	.09[illegible]	.047	[illegible]	.5[illegible]

a. Dependent Variable: [illegible]

The fitted equation for this model is as follows:

Y = -0.323 + 0.494X1(TRUST) + 0.342X2 (USEFULNESS) + 0.141X3 (SECURITY)

This function tell us that if the variable 'Trust in Internet shopping' is 1 unit change, consumers' willingness to do Internet shopping will have 0.494 unit change.

The collinearity diagnostics (table 17) displays the eigenvalues, the condition index, and VIF. Generally, when the condition index is around 10, there are weak dependencies among the regression estimates. When the index is larger than 100, the estimates may have a large amount of numerical errors. The diagnostics showed in Table 12, though indicating unfavorable dependencies among the estimates, are not so excessive to dismiss model (SAS OnlineDoc, 1999).

Table 17. Collinearity Diagnostics

Model Dimension	Eigenvalue	Condition Index	VIF
1	8.768	1.000	
2	7.217E-02	11.023	1.753
3	4.395E-02	14.124	1.308
4	3.231E-02	16.475	1.392
5	2.527E-02	18.628	1.524
6	1.948E-02	21.218	1.815
7	1.585E-02	23.522	1.395
8	1.320E-02	25.774	1.473
9	9.627E-03	30.180	1.498

The analysis of residuals indicates that assumption of normal distribution of error terms was confirmed (Figure 10).

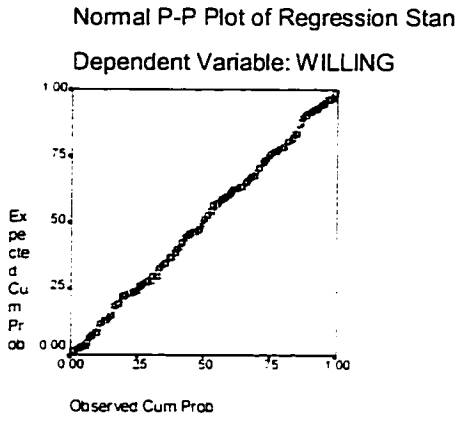


Figure 10. Normal P-P plot

7. Path Analysis

In order to better understand the interrelationships between independent variables, Path analysis was employed. Path analysis is a technique that uses both bivariate and multiple linear regression to assess indirect effects among variables specified in the model.

According to a measurement model proposed by C. Cheung & M. Lee (2000), perceived security and perceived privacy of an Internet vendor is positively related to consumers' trust in Internet shopping.

Warrington et al (2000) found that 'several cues may cause potential buyers to infer a certain of trust in the seller. These cues include 'an extended warranty

and / or guarantee' (such as return policies), 'offering the customer alternative ordering procedure'. These are the elements used to measure service quality.

Based on above study findings, a path diagram was drawn as follows.

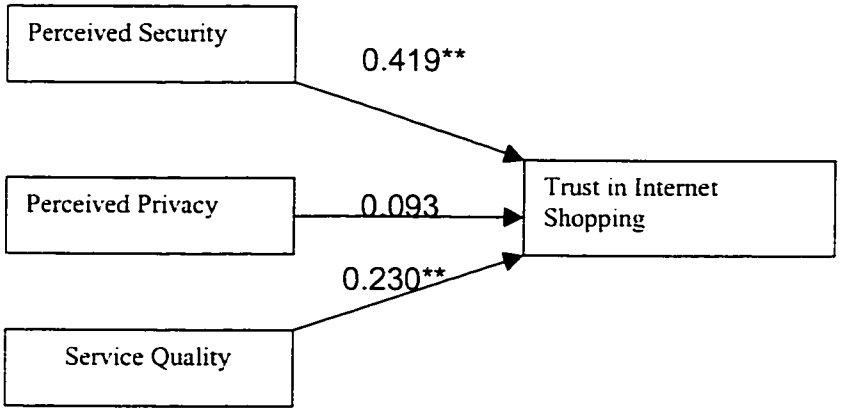


Figure 11. Path diagram for trust

Figure 11 presents the path coefficients along the arrows.

A study by Chiravuri and Nazareth (2001) identified information quality and perceived ease of use as antecedent factors to perceived usefulness. A path diagram was drawn in terms of above findings.

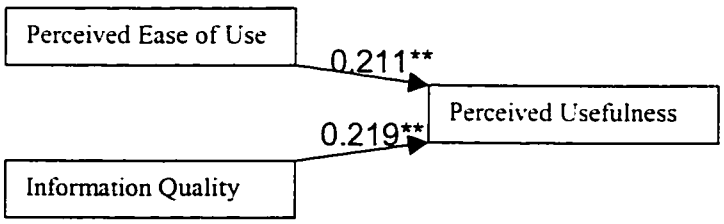


Figure 12. Path diagram for perceived usefulness

Figure 12 presents the path coefficients along the arrows.

The strength of an individual path was evaluated using the standardized path coefficient. The total effect of one variable on another is obtained by summing up its direct and indirect effects through relevant mediating variables (Chau & Hu, 2002). Figure 13 presents the path coefficients along the arrows for full model.

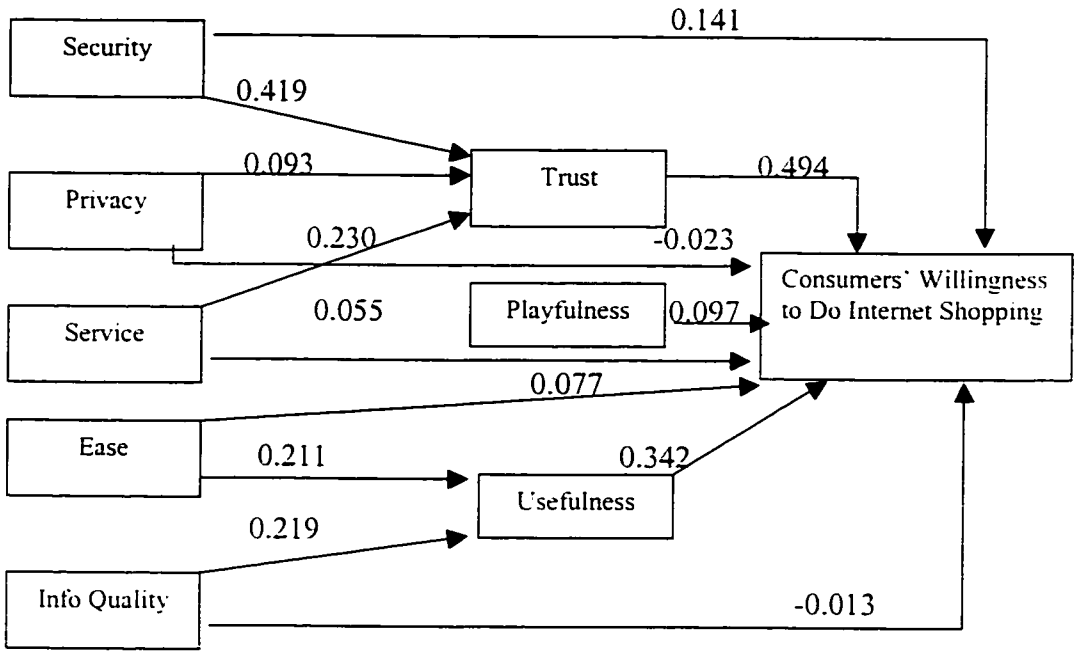


Figure 13. Path coefficients for full model

Table 18 shows the direct, indirect and total effect of each factor on consumers' willingness to do Internet shopping.

Table 18. Strengths of Individual Factor

Variable	Direct	Indirect	Total
Trust	0.494		0.494
Ease	0.077	0.072	0.149
Useful	0.342		0.342
Playful	0.097		0.097 non-sig
Secure	0.141	0.207	0.348
Privacy	-0.023	0.046	0.023 non-sig
Quality	-0.013	0.075	0.062
Service	0.055	0.114	0.169

Discussions

This study shows that Trust in Internet shopping, perceived security, perceived privacy, perceived usefulness, perceived ease of use, service quality, information quality and perceived playfulness all have positive impacts on consumers' willingness to do Internet shopping. These results are consistent with the recent studies. Perceived privacy and perceived playfulness have non-significant effect on consumers' willingness to do Internet shopping in this study.

1) Trust in Internet shopping is the most significant factor influencing on consumers' willingness to do Internet shopping ($b1 = 0.494$, $p < 0.000$). There is an urgent need for trust for the conversion of Internet users to Internet shoppers. Understanding antecedents of trust in Internet shopping should be a major concern of Internet vendors. Trust is the grease in the wheels of electronic commerce. It's not only as a facilitator of consumer acquisition, but also for enabling relationship building (Papadopoulou et al, 2001)

Some trust services and seal programs will help increase consumer trust in electronic commerce. Internet vendors offer a 'seal of approval' through placing 'security brand' logos on their website. 'Seal of approval' seek to re-assure the consumer that controls have been established. In addition, an independent third party holds payment in trust until the buyer receives and accepts the item from the seller. Trusted third party service assures parties to an online transaction that complaints will be acted upon and wrongs will be redressed.

2) Perceived usefulness is also one of the most important determinant of consumers' willingness to do Internet shopping ($b2 = 0.342$, $p < 0.000$). This provides some support on the Technology Acceptance Model in the electronic commerce context. Consumer is likely to accept Internet shopping when he or she realizes that online shopping can fulfil his or her service needs such as product variety, competitive price, convenience and high quality products.

3) Perceived security is another significant factor affecting consumers' willingness to do Internet shopping ($b3 = 0.141$, $p < 0.045$). It not only influences consumer willingness to do Internet shopping directly but also indirectly through trust in Internet shopping. If consumers feel less transaction risks, they would be more willing to transact over the Internet. Securing an electronic commerce site requires that the privacy of data and messages must be protected, identities must be verified, and unauthorized access must be controlled. Encryption, digital signatures and certificates that provide foundation for client and server security.

4) Perceived ease of use has a non-significant direct effect on consumers' willingness to do Internet shopping. It confirmed the results conducted by Pavlou (2001). This can be explained by the difference between university students and general consumers. University student's higher expertise in computer and Internet application may understand and learn the use of Internet shopping very easily and quickly. In addition, Davis (1989) thought, ease of use might act on

intention to use indirectly through usefulness. From our data, perceived ease of use has significant effect on perceived usefulness ($b = 0.211$, $p < 0.007$).

5) Perceived playfulness has a non-significant effect on consumers' willingness to do Internet shopping. In my opinion, this factor will enhance consumers' loyalty to Internet vendor website after actual purchase, not directly affect on intention to do Internet shopping. This result could be explained by the findings (Wolfinbarger & Gilly, 2001) --- Online shopping is more likely to be goal--focused rather than experiential (for fun).

6) Information quality does not directly influence on consumers' willingness to do Internet shopping, but it indirectly affect on consumers' willingness to do Internet shopping through perceived usefulness ($b = 0.219$, $p < 0.005$).

7) Perceived privacy has a non-significant effect on consumers' willingness to do Internet shopping. It has a non-significant effect on trust in Internet shopping, too. This result is consistent with the findings by Pavlou (2001). Regression analysis in the presence of other antecedents of trust counteracts the effect of perceived privacy. Privacy may be regarded as a determinant of perceived security rather than as a purely direct antecedent of consumers' willingness to do Internet shopping.

8) Service quality has a non-significant direct contribution to consumers' willingness to do Internet shopping. But it has a significant indirect effect on consumers' willingness to do Internet shopping through trust in Internet shopping ($b = 0.230$, $p < 0.001$).

Based on the empirical study concerning service quality dimensions in the context of electronic commerce, Yang and Jun (2002) found that Internet purchaser and non-purchaser had different perception of service quality dimensions. Especially when examining the relative importance of each dimension affecting overall service quality assessment, the 'reliability' factor was found to be most important dimension for Internet purchaser while Internet non-purchaser consider 'security' as their most critical concern. As most of measurement items for service quality in this study belong to 'reliability' attribute and Majority of respondents have no actual online shopping experience (non-purchaser). These attributes could be good reasons to explain why service quality showed non-significant direct effect on consumers' willingness to do Internet shopping in this research. This suggests that future study should consider 'security' dimension in measuring service quality.

Future Research Considerations

A number of related interesting issues appeared during this research that should be considered for future research. Some additional or mediating factors need to be identified. These factors may include perceived risks, shopping experience and company reputation. Reduced risk associated with buying from an Internet store would likely increase the likeness a consumer purchase from that store (Jarvenpaa et al, 2000). Experiences with friends and colleagues encourage consumer to show interest in shopping online and to consider experimenting with making some purchases (Brown & Sellen, 2002). Company reputation has been regarded as another important factor to make consumers transact online (Doney and Cannon, 1997).

As a major issue in electronic commerce, more efforts should be focused on understanding antecedents of trust.

A more practical research will be needed to establish the relationship between consumers' actual purchase and consumers' intention to buy online.

Limitations

The use of self-report scales to measure research variables suggests the possibility of a common method of bias for some of the results because of people's ability to make accurate self-reports and not willingness to make totally accurate reports (Whitley, 1996).

University students' higher education and expertise in electronic commerce compared to general population may limit results. To achieve the required degree of generalizability, research must also be carried out in truly diverse consumer population.

According to the research on trust in Internet shopping (Borchers, 2001), studying Far Eastern participant yielded much weaker results in his research. This may be due to subtle misunderstandings of the instruments by far east participant whose native language is not English. In my study, It's estimated that nearly 1/3 respondents are immigrants from Asia. The results in this research may be weaker than expected.

In addition, Measurement items for the variables exhibited reasonable but not very highly satisfactory reliability.

Conclusion

This study uses empirical researches to investigate factors essential to consumers' willingness to do Internet shopping and validate theoretical relationship. From the findings of study, trust in Internet shopping, perceived ease of use, perceived usefulness, perceived playfulness, perceived security, perceived privacy, information quality and service quality are positively and significantly related to consumers' willingness to do Internet shopping. All factors except perceived privacy and perceived playfulness are useful in predicting and understanding consumers' willingness to do Internet shopping. Multiple regression analysis shows that Trust in Internet shopping, perceived usefulness and perceived security significantly and directly influences on consumers' willingness to do Internet shopping.

Through path analysis, interrelationships between independent variables were examined. Perceived security and service quality indirectly affect consumers' willingness to do Internet shopping through trust in Internet shopping. Perceived ease of use and information quality indirectly affects consumers' willingness to do Internet shopping through perceived usefulness.

Understanding the antecedents essential to consumers' intention to use Internet shopping can lead to more effective and meaningful scheme that help companies to remain competitive.

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Appendix A

Survey Questionnaire

Instruction letter to the questionnaire

Dear Madam / Sir:

The purpose of this questionnaire is to explore the factors that affect on consumer's willingness to do Internet shopping. The questionnaire is aimed at individual consumers.

I have carefully prepared a short questionnaire that will take approximately 15 minutes to complete. Your response is anonymous and will be used for this study only. All the information will be kept confidential.

Your participation in this survey is very important to this study, please answer all questions and return it to me.

If you have any questions regarding this questionnaire, please feel free to contact me by phone, or through email at the following address:

Tel: 514-9350888
Email: jingoushu@yahoo.com

Thank you in advance for your precious cooperation.

Jing-Ou Shu
M. Sc. (Administration) Student
John Molson School of Business
Concordia University

General information to the questionnaire

Age:

Below 20 ___ 20-30 ___ 31-40 ___ Above 40 ___

Gender:

Male ___ Female ___

Level of study:

Undergraduate ___ Graduate diploma ___ Master ___ Ph.D. ___

Status:

Full time ___ Part time ___

Area of Study:

Commerce & Administration ___ Arts & Science ___
Engineering & Computer Science ___ Fine Arts ___
Other (specify) _____

Experience working with the Internet:

1 – 6 months ___ 7 – 12 months ___ > 1 year ___

Using the following scale, please answer questions by circling the number that best represents your opinion.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Consumer's willingness to do Internet Shopping

1.	Given the opportunity, I intend to use the Internet for shopping.	1	2	3	4	5
2.	Given the opportunity, I predict that I would use the Internet for shopping in the future.	1	2	3	4	5
3.	I will strongly recommend others to use the Internet for shopping.	1	2	3	4	5
4.	I intend to completely switch over to use the Internet for shopping.	1	2	3	4	5
5.	I intend to increase my use of the Internet for shopping in the future.	1	2	3	4	5

Trust in Internet shopping

1.	Internet shopping is trustworthy and reliable.	1	2	3	4	5
2.	Internet vendors are known as ones that keep promises and commitments.	1	2	3	4	5
3.	I trust Internet vendors keep my best interests in mind.	1	2	3	4	5
4.	Internet shopping can not be trusted, there are just too many uncertainties.	1	2	3	4	5
5.	Many things may wrong with my transactions with Internet vendors.	1	2	3	4	5

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Perceived ease of use

1.	It will be impossible to use Internet shopping without others' help.	1	2	3	4	5
2.	It is difficult to learn how to use Internet shopping.	1	2	3	4	5
3.	It takes too long a time to learn to use Internet shopping.	1	2	3	4	5
4.	It is easy to remember how to use Internet shopping.	1	2	3	4	5
5.	Using Internet shopping requires a lot of mental effort.	1	2	3	4	5
6.	My interaction with Internet shopping is clear and understandable.	1	2	3	4	5
7.	It is easy for me to become skilful at using Internet shopping.	1	2	3	4	5
8.	Overall, I find shopping over the Internet easy to use.	1	2	3	4	5

Perceived usefulness

1.	Using Internet shopping supports the main part of my shopping.	1	2	3	4	5
2.	Using Internet shopping enables me to accomplish the shopping more quickly.	1	2	3	4	5
3.	I think using Internet shopping creates value to me.	1	2	3	4	5

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

4. The content on the Internet shopping website is useful to me.	1	2	3	4	5
5. Overall, I find Internet shopping useful.	1	2	3	4	5

Perceived playfulness

1. Internet shopping web sites give fun to me for shopping.	1	2	3	4	5
2. Internet shopping web sites stimulate my curiosity.	1	2	3	4	5
3. Internet shopping web sites lead to my exploration.	1	2	3	4	5
4. Internet shopping gives enjoyment to me for shopping.	1	2	3	4	5
5. Internet shopping motivates consumers to feel participation.	1	2	3	4	5
6. Internet shopping web sites use the charming features to attract consumers.	1	2	3	4	5
7. Internet shopping web sites promote customer concentration.	1	2	3	4	5

Perceived security

1. I am confident that the information I provide during my transaction will not reach inappropriate parties.	1	2	3	4	5
2. I believe inappropriate parties can not deliberately observe the information I provide during my transaction.	1	2	3	4	5

Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5

3.	In my opinion, inappropriate parties will not collect and store the information I provide during my transaction.	1	2	3	4	5
4.	Overall, I have confidence in the security of my transaction with Internet vendors.	1	2	3	4	5
5.	Internet vendors usually ensure that transactional information is protected from being accidentally altered and destroyed during transmission on the Internet.	1	2	3	4	5

Perceived privacy

1.	I am confident that Internet vendors do not disclose consumer private information to unauthorized parties.	1	2	3	4	5
2.	I believe Internet vendors will not share my private information without my consent in the future.	1	2	3	4	5
3.	I have control over how the private information I provide will be subsequently used by Internet vendors.	1	2	3	4	5
4.	I feel safe about the privacy control of Internet vendors.	1	2	3	4	5
5.	Internet vendors concern about consumers' privacy.	1	2	3	4	5

Information quality

1.	I think information on Internet vendors' web sites is accurate.	1	2	3	4	5

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

2.	I think information on Internet vendors' web sites is complete.	1	2	3	4	5
3.	I think information on Internet vendors' web sites is relevant.	1	2	3	4	5
4.	I think information on Internet vendors' web sites is timeliness	1	2	3	4	5
5.	Internet shopping web sites provide customized information presentation.	1	2	3	4	5
6.	Internet vendors provide complete description of products / services.	1	2	3	4	5

Service quality

1.	Internet vendors respond to customers' requirement quickly.	1	2	3	4	5
2.	Internet vendors assure to solve customers' problems.	1	2	3	4	5
3.	Internet vendors provide follow-up service to customers.	1	2	3	4	5
4.	Internet vendors handle returns and refunds efficiently.	1	2	3	4	5
5.	Customers can place, alter, and cancel orders easily on the Internet.	1	2	3	4	5
6.	There are varieties of products and services available for consumers to choose.	1	2	3	4	5