

A Study on Security, Interaction and Navigation Functionality for Customer Trust on Line

- focus on internet bookshops -

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Abstract

In recent years, electronic commerce has provided another access for consumers to purchase products. Shopping on line provides much information and less searching cost for customers, but some researches have pointed out that there are difficulties for companies to do business on web. For lack of trust, many people not prefer purchasing through virtual channels. Based on the literature review, this study aims at empirically testing the impact of website design on individual trust in internet firms. From statistic analysis, we will conclude that security, interaction, and navigation functionality will affect on-line trust. The result of this study may provide some managerial implications, especially for firms which want to enter on-line businesses.

Keyword : Security, Interaction, Navigation Functionality, On-line Trust

1. INTRODUCTION

E-commerce is growing at an exponential rate(Gefen, 2000). Because of tremendous performance of e-commerce, more and more companies are willing to adopt this new marketing method, and to join the group of electronic commerce.

In Korea, about 15 million people have visited internet shops at least once, and among internet shops, book is the second most purchased items(NIDA, 2003). This can show the importance of internet bookshops among a variety of internet shops.

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Because the attractiveness of e-commerce and the popularity of internet bookshops among internet shops, more and more firms join in to compete in order to gain profit. According to NIDA(2003), in 2001, there are 1168 internet bookshops in Korea, 2193 in 2002, and the number comes to 2870 in 2003. At the same time, the sale increases rapidly, take "yes24" for instance, its mean sales of internet bookshop per day has reached 75 million KRW this year and have almost increased 10 times comparing to last August. We can say that the competition between internet bookshops will be more fierce. Because the discount rate of books sold in internet will not vary a lot(even though the fixed price system for books hasn't been introduced in Korea), in this case, website mechanisms and trust in the web shops will play an important role in order to gain profit. This is the main reason why we choose internet bookshops as our research target.

Through extensive literature review, we can see that previous researches don't have a common view about the trust antecedents. Some point out only one variable such as familiarity but some researches have not only one antecedent. Among all of the antecedents, what are the factors which can be controlled by firms is the main point in this study. In this research, we try to condense the factors in previous researches into a few constructs and by understanding the antecedents, firms can gain much trust and make successful on-line business.

2. LITERATURE REVIEW

There are many factors to determine the successfulness for an on-line business, such as trust, price, and deliver on time, but it is to say that trust is certainly the most important factor of all(Doney & Cannon, 1997). In the world of business, trust is the key to successful transactions and long-term relationships(Corritore et al., 2003). Compared with traditional channels, on-line purchase involves higher degree of uncertainty and risk(Grabner & Kaluscha, 2003). Generally speaking, when purchasing through internet shops, customer are not able to check the products' quality nor can they guarantee the safety of their personal information such as credit card information.

There are many discussion for the antecedents of on-line trust, and we are able to categorize the antecedents into different sections, because the participants involved in on-line transactions can generally be divided into two--buyers and sellers, we can divide the antecedents according to the characteristics of those two parties. Besides, environmental factors could also influence trust. Therefore we

categorize the antecedents of on-line trust into three: environmental factors, individual factors and enterprise factors. We will use enterprise factors in our research, because it is the only one category which can be controlled by company itself. Among all the enterprise factors, we used the factors related with website design and refine it into three constructs, which are security, interaction, and navigation functionality.

As we can see from the Table 2.3, almost all of the trust antecedents under the researches related to enterprises can be reconciled within these three constructs. The factors which are classified under "others" mostly are not related to our main focus on website design, for example, personal variables.

Table 2.3 Refining the Trust Antecedents from Enterprise Factors

Research	Security	Interaction	Navigation Functionality	Others
Koufaris &HamtonSosa, 2002			perceived usefulness, perceived ease of use	
Lee et al., 2000		communication shared value	comprehensive information	
McKnight et al., 2002	structural assurance of the web		perceived site quality	
Pavlou, 2001	privacy			
Morgant, 1994		communication		shared value,
Yoon, 2002	transaction security		navigation functionality	personal variables, website properties
Lee &Turban, 2001	effectiveness of security infrastructure, and third party certification		technical competence	

3. RESEARCH DESIGN AND METHODOLOGY

According to the research objectives and literature review, we propose the research framework as Figure 3.1.

3.1 Research Hypothesis

3.1.1 Security

When talking about how to build on-line trust, security has been an important factor. Researchers have concluded that security is an important factor in establishing on-line trust(Yoon, 2002; Lee & Turban, 2001). The so-called security includes protection of personal information, confidential transaction information, and third-party certification(Urban et al., 2000; Yoon, 2002). The more safety secured by websites, the more possibility for customers to trust web shops, to provide

personal information, even to purchase on-line. For the above reasons, we propose:

H1. Security has a positive effect on on-line trust.

H1 (a): The transaction security has a positive effect on on-line trust.

H1 (b): Personal security has a positive effect on on-line trust.

H1 (c): Third-party certification security has a positive effect on on-line trust.

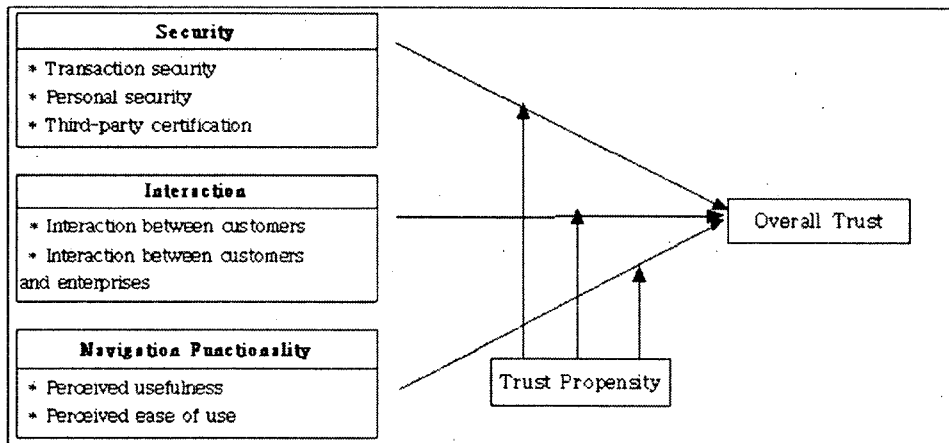


Figure 3.1 Research Framework

3.1.2 Interaction

Communicate or transfer information through internet media can allow users to present their thoughts or feelings with company or other users, in order to get more familiar with each other and earn feedback. The meaning of interactive can include three arrangement of ideas(Deighton, 1996): the ability to address an individual; the ability to gather and remember the response of that individual, and the ability to address once more in a way that takes into account his or her unique response. Thus, we propose that

H2. Interaction has a positive effect on on-line trust

H2 (a): Interaction between customers has a positive effect on on-line trust

H2 (b): Interaction between customers and enterprises has a positive effect on on-line trust

3.1.3 Navigation Functionality

Under the construct of navigation functionality, we proposed two variables: perceived usefulness and perceived ease of use; the idea of the two variables was adapted from the Technology Acceptance Model(TAM). According to Theory of

Reasoned Action proposed by Fishbien & Ajzen in 1975, individual's behavior will be affected by the attitude toward the behavior itself. we propose that customers' perception on websites navigation functionality may affect on-line trust.

H3. Website's navigation functionality has a positive effect on on-line trust

H3 (a): Perceived usefulness of websites has a positive effect on on-line trust.

H3 (b): Perceived ease of use of websites has a positive effect on on-line trust.

3.1.4 Trust Propensity

Trust propensity is proposed to be a stable with-in party factor that will affect the likelihood the party will trust(Mayer et al., 1995). Trust propensity can be refer as a personal trait that moderates the effect of trust antecedents on the formation of on-line trust(Lee & Turban, 2001). Therefore, we propose that

H4. Trust propensity moderates the relationship between website design factors and individual trust in internet bookshops

H4 (a): Trust propensity moderates the relationship between security and individual trust in internet bookshops

H4 (b): Trust propensity moderates the relationship between interaction and individual trust in internet bookshops

H4 (c): Trust propensity moderates the relationship between navigation functionality and individual trust in internet bookshops

3.2 Operational Measures

There are five variables in this research: security, interaction, and navigation functionality, are so-called independent variables; on-line trust is what we put as dependent variable; and trust propensity is the moderator.

By using other research's questionnaires(Lee & Turban, 2001; Yoon, 2002; Suh & Han, 2002; Bhatta cherjee, 2002) as references and based on the objectives of our research, we stated the definition, content of item, and measurement; all of the item measure will be using Likert 7-point scale. Research variables were gathered through questionnaires. A total of 283 questionnaires were collected through E-mail and interview, and 268 questionnaires are usable, representing 94.6% of the total.

4. RESEARCH RESULTS AND ANALYSIS

4.1 Reliability Analysis

To test the reliability of the items asked in the research questionnaire, we used reliability analysis to ensure that the questions we designed for our questionnaire are highly representative of each variable. The value of Cronbach's α is used to measure the reliability of the questions in the five measures. Items with Cronbach's α below 0.5 will be deleted. Throughout the test we find out that all of the Cronbach's α are greater than 0.728, meaning the measures have high reliability. The result of the test is shown in Table 4.1.

Table 4.1 Reliability Test

Constructs	Factors	Items	Cronbach's α
Security	Transaction security	4	.887
	Personal security	5	.901
	Third-party certification	3	.834
Interaction	Interaction between customers	4	.833
	Interaction between customers and enterprises	3	.728
Navigation Functionality	Perceived usefulness	4	.925
	Perceived ease of use	3	.924
On-line Trust		4	.891
Trust propensity		4	.864

4.2 Regression Analysis for On-line Trust

Linear regression was used to examine the relationships between independent variables and dependent variable. We used multi-regression analysis for testing H1, H2, and H3. At significant level 0.05, hypotheses H1(a), H1(b), H1(c), H2(a), H2(b), H3(a), H3(b)(H1, H2 and H3) are all supported under the research model.

Table 4.2 Regression Analysis for Testing H1~H3

Constructs	Factors	β estimate	t value	R ²	Adj-R ²	F value
Security	Transaction security	.472	8.574***	.440	.433	69.092***
	Personal security	.131	2.393*			
	Third-party certification	.194	3.646***			
Interaction	Interaction between customers	.123	2.119*	.365	.361	76.311***
	Interaction between customers and enterprises	.529	9.101***			
Navigation Functionality	Perceived usefulness	.545	7.728***	.449	.445	108.046***
	Perceived ease of use	.154	2.185*			

Dependent variable: on-line trust ***p<.001, **p<.01, *p<.05

As shown in Table 4.2, that internet bookshops with better transaction security, personal security, third-party certification, interaction between customers, interaction between customers and enterprises, perceived usefulness, and perceived ease of use will lead to a higher customers' trust in them.

The R^2 value for the three constructs, namely security, interaction, and navigation functionality, are .440, .365, .449, meaning that the explanation ability is good for our dependent variable, on-line trust.

4.3 Stepwise Regression

Throughout stepwise regression we can find out the explanatory of the seven factors for our dependent variable(on-line trust). In order to see of all seven factors, how well is the explanatory ability for our dependent variable.

After analyzing, we abandon two of the variables, due to the F value, which are higher than 0.5 significance(interaction between customers and perceived ease of use). Our result of stepwise regression is at the Table 4.3.

Table 4.3 Stepwise Regression Analysis

Variables	On-line Trust				
	Model 1	Model 2	Model 3	Model 4	Model 5
	β	β	β	β	β
Independent variable					
Perceived usefulness	.663***	.462***	.331***	.335***	.343***
Transaction security		.371***	.331***	.276***	.239***
Interaction between customers and enterprises			.262***	.227***	.211***
Third party certification				.154***	.130**
Personal security					.103*
R^2	.439	.536	.580	.599	.606
Adjusted R^2	.437	.533	.576	.593	.599
ΔR^2	.439	.097	.044	.018	.007
F	208.359***	153.362***	121.720***	98.090***	80.615***
ΔF	208.359***	55.597***	27.623***	11.993***	4.898*

Dependent variable: on-line trust ***p<.001, **p<.01, *p<.05

From Table 4.3, we can see that perceived usefulness is the factor with the highest R^2 (.439). We may say that perceived usefulness has the highest ability to interpret on-line trust, which can explain at a .439 level. Continue adding transaction security can increase the R^2 value to .536. Interaction between customers and enterprises, third party certification, and personal security can increase the R^2 value by .044, .018, and .007 individually. Among all the five

factors, the most important one for on-line trust is perceived usefulness(=.343 in Model 5); the second will be transaction security(=.239); the following one is interaction between customers and enterprises(=.211). All five factors have the ability to explain the model for on-line trust at the R^2 value of .606.

4.4 Moderator Effect by Trust Propensity

This part is for testing hypothesis H4 as well as H4 (a)~H4 (c).

We evaluated whether trust propensity will moderates the relationship between website design factors and individual trust in internet bookshops by using multiple regression and adding the interactive item between independent variable and moderator.

Table 4.4 Moderating Effect of Trust propensity on Security and On-line Trust

Variables	On-line Trust		
	Model 1	Model 2	Model 3
	β	β	β
Independent variable			
Security	.627***	.624***	.412*
Trust propensity		.010	-.243
Security* Trust propensity			.367
R^2	.393	.393	.396
Adjusted R^2	.390	.388	.389
ΔR^2	.393	.000	.003
F	171.862***	85.641***	57.708**
ΔF	171.862***	040*	1.512

Dependent variable: on-line trust *** $p < .001$, ** $p < .01$, * $p < .05$

As the results shown in the Table 4.4, we can see that trust propensity will not moderate the relationship between security, and on-line trust. Later, we can find out that trust propensity will not moderate the relationship between interaction, navigation functionality and on-line trust either. Therefore, we conclude that hypothesis H4 has not being supported.

The result shows that individual trust propensity may not affect the relationship between the perceived function of the internet bookshops and customers' trust on it. That is to say relation of the objective part of the website design and internet trust will not change because of different trust propensity.

5. CONCLUSION AND DISCUSSION

5.1 Research Conclusion

The results for the hypotheses tested are follows:

① Security has positive effect on on-line trust: this result is consistent with previous researches that security is an important factor in establishing on-line trust(Yoon, 2002; Lee & Turban, 2001).

② Interaction has a positive effect on on-line trust: this result is consistent with the inference of "the better the interaction feeling for customers, the more familiarity for the internet bookshops", so that the interaction can lower customers' perceived risk and increase trust.

③ Website's navigation functionality has a positive effect on on-line trust: according to our research result, we know that the more usefulness of the web shop and the more easy to use of the website, the more will customers trust on it. Our research result on navigation functionality is also consistent with what we mentioned before, the transaction experience between buyers and salesperson will also affect buyers' trust on salesperson. The trust on sales person will eventually turn out to be the trust on firms(Doney and Cannon, 1997).

④ Trust propensity will not moderates the relationship between website design factors and individual trust in internet bookshops: throughout empirical research, we conclude that trust propensity will not moderate the relationship between website design factors and individual trust in internet bookshops.

5.2 Contribution

Although internet is a new channel for business emerging in recent years, it still lacks of an integrated model for discussion. At first, many researches when discussing about on-line trust only regard security as the influence factor. In this research, we proposed the theoretical contribution from integrating security, interaction and navigation functionality in presenting website design factors, which can be refer as the factors that enterprises can control. Among all factors used in this research, we find out that the perceived usefulness is the most important one for establishing on-line trust instead of transaction security. Trust propensity is not having the moderating effect on the formation of on-line trust in our research.

Based on the research conclusion, we proposed a few points for internet bookshops to consider for gaining customers' trust.

① To increase security mechanism: we suggest that companies should work hard to provide a safety purchasing system and to make sure that customers personal information won't be easily accessed by hackers. Also, try to gain as much security certification and place in on website can make customers have more trust in the web shops.

② To enhance interaction system: the more the company gets to understand their customers and has better interaction with them, the more the customers will trust in the company. To send birthday presents or cards, to response customers' complaints, and to publish e-papers are useful techniques. Besides, to provide a place for customers to discuss their opinions can also enhance the trust in internet bookshops.

③ To have a more powerful website for navigating: we suggest that companies should work on to provide a more easy to use and not too complicated navigating function. Also, companies should investigate about what kind of information or functions will make customers feel more useful.

5.3 Further Research Suggestions

To apply this research model to customers from different cultures, because people from different background might have different insights about what are the important factors to establish on-line trust. Research for other products with different characteristics may have different outcomes. We suggest that future research could test this research model on different products or different kinds of internet shops to gain robustness of this model in evaluating the antecedents of on-line trust.

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Personal Data

37. Gender Male Female
38. Age 11-20 21-30 31-40 41-50 51-60 above 61
39. Education. primary school junior high school high school college/university
 master Ph D.
40. Disposable income(monthly)
- below USD 500 UDS 501~1000 USD 1001~1500
- USD 1501~2000 USD 2001~3000 above USD 3001
41. Job Answer: _____
42. How long have you been using Internet?
- less than 6 months 6 months~2 years 2~3 years
- 3~4 years 4~5 years more than 5 years
43. How do you connect to the Internet?
- modem DSL Cable Modem ISDN
- in school in company in coffee shop others
44. How many times have you purchased from on-line bookshops?
- once 2~10 times 11~20 times more than 21 times
45. Email _____

저 자 소 개

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