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Trust in Internet Shopping: A Proposed Model and Measurement Instrument

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Abstract

Despite the phenomenal growth of Internet users in recent years, the penetration rate of Internet shopping is still very low and one of most often cited reasons is the lack of consumers' trust [e.g. Hoffman et al., 1999]. Although trust is an important concept in Internet shopping, there is a paucity of theory-guided empirical research in this area. In this paper, a theoretical model is proposed for investigating the nature of trust in the specific context of Internet shopping. In this model, consumers' trust in Internet shopping is affected by two groups of antecedent factors, namely, "trustworthiness of Internet vendors" and "external environment". In addition, the effects of these factors on trust are moderated by the consumers' propensity to trust. Trust, in turn, reduces consumers' perceived risk in Internet shopping. As a step towards the rigorous testing of the model, a 30-item measurement instrument has been developed with its reliability and validity empirically tested. This research contributes to the development of trust theory in e-commerce and provides a validated instrument for the measurement of various important trust related constructs.

1. Introduction

The growth of the Internet and its user base in recent years has been truly phenomenal. In the USA alone, the projected number of Internet users by the year 2000 reaches 55 million¹ and the annual growth rate remains high. Enormous potential therefore exists for the use of the Internet for the purchase of goods and services ("Internet Shopping"). However, this potential remains largely untapped as recent market surveys have confirmed that many Internet users are still reluctant to make purchases on the Internet. One of the most often cited reasons for consumers not purchasing from Internet shops is the *lack of trust*, which stops or discourages consumers from entering into exchange relationships with Internet

shops. Despite the importance of trust in consumer-based electronic commerce, little theory-guided empirical research has been undertaken to understand the nature of trust, its antecedents and consequences in the specific context of Internet shopping. The few research papers available [e.g. Jarvenpaa et. al., 1999] tend to focus on very small models, ignoring many potentially important constructs (e.g. trust propensity, privacy and security) suggested by the rich but distant literature on trust. Thus, more research is called for. In addition, the study of e-commerce trust has been hampered by a lack of validated measurement instrument in the literature. As a step towards bridging this gap, this paper proposes a research model of trust in Internet shopping and presents the development of an empirically validated measurement instrument for testing the trust model.

2. Trust

The notion of trust has been examined under various contexts over the years, e.g. in bargaining [Schurr & Ozanne, 1985], industrial buyer-seller relationships [Doney & Cannon 1997], distribution channels [Dwyer, Schurr & Oh, 1987], partner cooperation in strategic alliances [Das, 1998] and the use of market research [Moorman et al, 1993]. Different theoretical perspectives have been used in these studies, which may be aggregated into three categories [Lewicki & Bunker, 1995]:

- ◆ The views of personality theorists, conceptualizing trust as a belief, expectancy, or feeling which is deeply rooted in the personality and has its origins in the individual's early psychological development.
- ◆ The views of sociologists and economists, conceptualizing trust as a phenomenon within and between institutions, and as the trust individuals put in those institutions.
- ◆ The views of the social psychologists, characterizing trust in terms of the expectation and willingness of the trusting party engaging in a transaction, the risks associated with and acting on such expectations, and the contextual factors that serve to either enhance or inhibit the development and maintenance of that trust.

¹ According to AC Nielsen's 1999 NetWatch Internet Survey,
<http://acnielsen.com/download/pdf/info/netwatch.pdf>

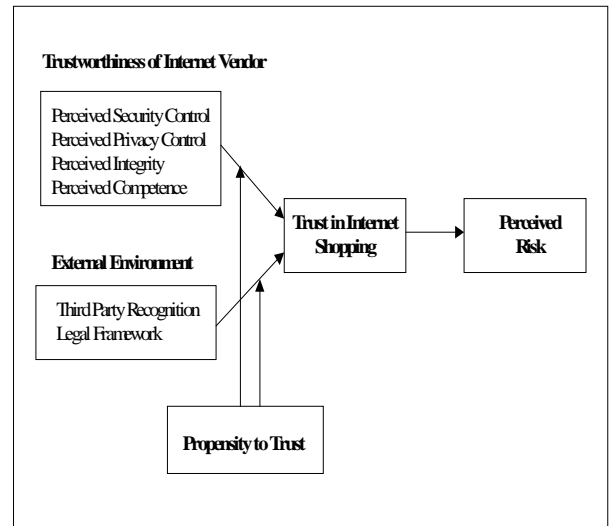
Although the social-psychological perspective appears to be most relevant in the understanding of consumer trust in Internet shopping as this perspective focuses on transactions, the other perspectives also contribute to our understanding of trust in this context in their unique ways. For example, it would be insufficient to consider consumers' trust in Internet shopping without examining the trust propensity (which is a personality trait) of the consumers concerned.

The distant literature on trust across a wide variety of disciplines provides a useful basis on which to investigate consumer trust, its antecedents and consequences in the context of Internet shopping. However, most of the literature still suffers from the problems identified by Mayer and Davis (1995). Confusions between trust and its antecedents still abound. For example, in Kini & Choobineh (1999) the definition of trust included the sources of trust itself. In addition, most of the literature does not contain empirical supporting evidence. In the context of consumer trust in Internet shopping, theory-guided empirical study is rare. This severe lack of theory-guided empirical studies is critically impeding our understanding of consumers' trust in Internet shopping.

3. Research Model and Propositions

This research synthesizes the distant literature on trust in order to develop an integral research model of consumer trust in Internet shopping (CTIS). According to Hardin (1992), trust is a three-party relation involving properties of a trustor, attributes of a trustee, and a specific context which trust is conferred. As depicted in Figure 1, trust in Internet shopping is affected by the trustworthiness of an Internet vendor and relevant external environmental factors impacting on Internet shopping transactions. These antecedent factors are moderated by an Internet shopper's propensity to trust. Limerick and Cunnington (1993) also argued that trust can reduce uncertainty about the future and is a necessity for a continuing relationship with participants who have opportunistic behavior. The essence of risk is uncertainty about the future. Thus, the formation of trust, in turn, reduces consumers' perceived risk of Internet shopping.

Figure 1: A Conceptual Model of Trust in Internet Shopping.



3.1 Trustworthiness of Internet Vendor

The perceived trustworthiness of a party is often suggested as an important antecedent of trust. There is a long line of research examining the influence of perceived trustworthiness on the building of trust. Mayer et al. (1995) found that three factors - ability, integrity, and benevolence - are consistently related to trust in most previous studies. Hence, these factors are included in our model. In addition, in the specific context of this study, two new factors are added to the model to reflect the specific nature of Internet shopping. These two factors are Perceived Security Control (PSC) and Perceived Privacy Control (PPC).

PSC and PPC are critical characteristics of Internet shopping transactions affecting the development of Internet users' trust in Internet shopping. Previous studies find that these two factors are the major concerns of Internet users. In particular, privacy is the number one consumer issue facing the Internet [Bensassi, 1999; Hoffman et al., 1999; Wang et al., 1998].

Perceived Security Control (PSC)

In this study, perceived security control refers to the Internet users' perception on the Internet vendors' ability in fulfilling security requirements, such as authentication, integrity, encryption, and non-repudiation. Therefore, the proposition is:

Proposition 1: The perceived security control of an Internet vendor is positively related to CTIS.

Perceived Privacy Control (PPC)

In this study, perceived privacy control is conceived as the Internet users' perception on the ability of Internet vendors in protecting consumers' personal information

collected from its electronic transactions from unauthorized use or disclosure. Therefore, the proposition is:

Proposition 2: The perceived privacy control of an Internet vendor is positively related to CTIS.

Perceived Integrity (PI)

In this study, perceived integrity refers to the perception of Internet users on the honesty of Internet vendors. For instance, whether it has consistent actions, whether its actions are congruent with its own words, and whether its transactions with its consumers are fair. Therefore, the proposition is:

Proposition 3: The perceived integrity of an Internet vendor is positively related to CTIS.

Perceived Competence (PC)

Perceived competency, in this study, is defined as the Internet users' perception on the skills, abilities, and expertise of Internet vendors. Therefore, the proposition is:

Proposition 4: The perceived competence of an Internet vendor is positively related to CTIS.

3.2 External Environment

According to Lewicki and Bunker (1996), trust is context specific. In the faceless world of electronic commerce, third party recognition and a legal framework are two key environmental and contextual factors affecting the formation of consumers' trust. Benassi (1999) argued that third party recognition, such as TRUSTe, can help building consumers' trust on the Internet and in turn, accelerate the growth of the Internet. GVU 7th WWW User Survey ² also discovered that a majority of Internet users asked for more new laws to protect their privacy online.

Third Party Recognition (TPR)

In this study, third party recognition refers to the assurance of the trustworthiness of Internet vendors by third party recognition bodies. Thus, the proposition is:

Proposition 5: The perceived effectiveness of the third party recognition is positively associated with CTIS.

Legal Framework (LF)

In this study, legal framework refers to the law and code of practice established to protect Internet shoppers during electronic transactions. Thus, the proposition is:

Proposition 6: The perceived effectiveness of the legal framework is positively associated with CTIS.

² GVU 7th WWW User Survey (1997)
http://www.gvu.gatech.edu/user_surveys/

3.3 Propensity to Trust (PTT)

Propensity to trust is a stable within-party factor that affects the likelihood the party will trust. People with different cultural backgrounds, personality types, and developmental experiences vary in their propensity to trust [Hofstede, 1980]. This propensity to trust is viewed as a personality trait that leads to generalized expectations about the trustworthiness of others. Mayer et al (1995) have further suggested that trust propensity moderates the effects of the trust antecedents on the formation of trust. In determining whether to trust, consumers look for cues (e.g. trustworthiness) and the effect of trust propensity is to magnify or reduce the signals provided by these cues. Thus, the propositions for this moderating effect are:

Proposition 7: Propensity to Trust moderates the relationship between the perceived security control of an Internet vendor and CTIS.

Proposition 8: Propensity to Trust moderates the relationship between the perceived privacy control of an Internet vendor and CTIS.

Proposition 9: Propensity to Trust moderates the relationship between the perceived integrity of an Internet vendor and CTIS.

Proposition 10: Propensity to Trust moderates the relationship between the perceived competence of an Internet vendor and CTIS.

Proposition 11: Propensity to Trust moderates the relationship between the perceived effectiveness of the third party recognition and CTIS.

Proposition 12: Propensity to Trust moderates the relationship between the perceived effectiveness of the legal framework and CTIS.

3.4 Consequence of Trust: Perceived Risk (PR)

Perceived risk is very powerful in explaining consumers' behavior since consumers tend more often to avoid mistakes than to maximize utility in purchasing [Mitchell 1998]. In particular, perceived risk is obviously higher in Internet shopping than in the traditional mode of shopping. Peter and Ryan (1976) argued that perceived risk generally consists of two components, one related to an uncertainty or probability of loss notion and the other related to a consequence or the importance of the notion of loss. In this study, perceived risk refers to the Internet users' perception on the possibility of yielding unexpected outcomes with undesirable consequences. Many prior studies [Dion et al., 1995; Doney and Cannon, 1997; Morgan and Hunt, 1994] have discovered a strong relation between risk and the concept of trust. As suggested by Selnes (1998), perceived risk in a buyer-seller relationship is reduced by trust. Therefore, the proposition is:

Proposition 13: CTIS is negatively associated with perceived risk in Internet shopping.

4 Instrument Development

As there are so few theory-guided empirical studies on trust in Internet shopping, and available ones (e.g. Jarvenpaa et. al., 1999) are mostly unsuitable for this study because of different definitions of constructs, a large part of the measurement instrument in this study had to be developed from scratch, rather than be borrowed from the past literature. The process of developing a measurement instrument of the research model is based on Moore and Benbasat's (1991) approach. As claimed by some IS scholars [e.g. Bailey & Pearson 1983; Ives et al. 1983; Doll & Torzadeh 1988; and Davis 1989], there is a need to develop measurement instruments with a high degree of reliability and validity, that can serve as a prerequisite to cumulate knowledge in the IS discipline. The process of instrument development suggested by Moore and Benbasat (1991) consists of three stages: (1) Item creation, (2) scale development, and (3) instrument testing.

4.1 Stage 1: Item Creation

As discussed before, existing research on this topic is still very limited and validated measurement instruments are unavailable. Therefore, only five items are borrowed from the existing literature with slight modifications to fit the specific context of Internet shopping. The remaining 36 items are generated through focused interviews involving six subject experts and a number of potential Internet shoppers. All these items are shown in Appendix 1. As claimed by Moore and Benbasat (1991), the initial content validity of the items generated in this process can be ensured.

4.2 Stage 2: Scale Development

The process in this stage is slightly different from that in Moore and Benbasat's (1991) work. The process was simplified and only one sorting round with the labels and definitions of constructs given. Four judges from the Department of Information Systems of a local University business school were asked to categorize the 41 items into 11 constructs, so that the items of the same construct have similar meaning to each other, and dissimilar meaning to items of different constructs. Examination of the results of categorization showed a very high degree of agreement among judges. The average value of the degree of agreement, Kappa coefficient, was 0.96, while the overall placement ratio of items within target constructs was 95.73% (See Appendix 2). The result suggested a high degree of convergent and discriminant validity of the measurement instrument. Thus, a 41-item measurement instrument of trust model was developed using a seven-point Likert-type scale, from 1=strongly disagree to 7=strongly agree.

4.3 Stage 3: Instrument Testing

a. Pilot Test

The next stage of the development process is to perform a pilot test of the 41-item measurement instrument. Because this was an initial test, the sample size was kept quite small. Questionnaires were distributed to 40 research students and academic staff in the Faculty of Business of a local University. The aim of this test was to examine the initial reliability of the measuring items. The assessment was based on Cronbach's ALPHA and Nunnally (1967) argued that it can provide a good estimate of reliability in most situations. In the early stages of research on hypothesized measures of a construct, a modest level of reliability is acceptable [Nunnally 1967]. Therefore, the minimum level of reliability was set around 0.70 in this study.

The inter-item correlation and the effects of deleting items on ALPHA were used to determine the candidate items for further studies. As a result, five items were dropped and the number of measuring items became 36. These remaining items are listed on Appendix 1 and the Cronbach's ALPHA of the measurement instrument is shown in Table 1.

| | Pilot Test | (n=40) | Field Test | (n=405) |
|----------------------|------------|--------|------------|---------|
| Construct | Items | ALPHA | Items | ALPHA |
| PSC | 3 | 0.681 | 2 | 0.794 |
| PPC | 3 | 0.814 | 3 | 0.810 |
| PI | 3 | 0.725 | 2 | 0.764 |
| PC | 3 | 0.903 | 3 | 0.846 |
| PTT | | | | |
| personality | 4 | 0.934 | 4 | 0.881 |
| cultural environment | 3 | 0.738 | 2 | 0.833 |
| experience | 3 | 0.887 | 3 | 0.880 |
| TPR | 3 | 0.854 | 3 | 0.795 |
| LF | 3 | 0.853 | 2 | 0.882 |
| CTIS | 4 | 0.697 | 3 | 0.860 |
| PR | 4 | 0.823 | 3 | 0.864 |

Table 1: Cronbach's ALPHA of the measurement instrument

b. Field Test

In the field test, modified self-administrated questionnaires were distributed to the Management Information Systems (MIS) students from the Faculty of Business in a local university. As this is an exploratory study of trust in Internet shopping, convenience sampling approach was employed. Using this approach, information can be obtained quickly and inexpensively. A total of 405 pieces of usable questionnaire was collected and psychometric properties, such as reliability (Cronbach's ALPHA) and validity (Exploratory Factor Analysis), of the measurement instrument were examined.

Similar to the pilot test, six items were removed on the basis of inter-item correlation and the effects of deleting items on ALPHA. The remaining 30 items were then subjected to the exploratory factor analysis (EFA). Equamax rotation was applied on the 30 items and the results indicated a eleven-construct solution with a total of 68.81% variance explained in the data set. All items loaded on the “target” construct, with the lowest loading being 0.523, which regards as fair [Comrey 1973]. The Cronbach’s ALPHA of the measurement instrument is also shown in Table 1 and the factor loadings of these items are listed in Appendix 3.

5. Conclusions

Drawing from findings of recent electronic commerce research and integrating trust theories from the fields of marketing, psychology and sociology, this study proposes a conceptual model for the investigation of trust, its antecedents and consequences in the context of Internet shopping. Also, a 30-item measurement instrument with high reliability and validity for the trust model was developed using the confirmatory factor analysis (CFA) approach.

This proposed research model can improve our understanding of trust and electronic commerce, and add to the existing literature significantly. Now the research model is developed and the measurement instrument has been validated, the stage is set for the empirical testing of the theoretical model. The results of such testing will help to clarify and enrich the relevant theories and extend their boundaries. In addition, the results can inform the management of Internet shops how they can manipulate trust antecedents to increase consumers’ trust and hence improve the chances of consumer purchasing from their Internet shops. Finally, the validated research instrument can add to the repository of rigorous research instruments for IS survey researchers to use, thus helping to develop a cumulated tradition for research in the IS discipline.

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Appendix 1 Measurement Instrument

| Construct | Item | Sources |
|-----------------------------------|---|----------------------|
| Perceived Security Control | | |
| a1a | Internet vendors implement security measures to protect Internet shoppers. | New item |
| a1b* | Internet vendors have the ability to verify Internet shoppers' identity for security purpose. | New item |
| a1c | Internet vendors usually ensure that transactional information is protected from accidentally altered or destroyed during transmission on the Internet. | New item |
| a1d** | I feel secure about the electronic payment system of Internet vendors. | New item |
| Perceived Privacy Control | | |
| a2a* | Internet vendors will sell my personal information to the third parties without my permission. | New item |
| a2b | Internet vendors concern about consumers' privacy. | New item |
| a2c | Internet vendors will not divulge consumers' personal data to other parties. | New item |
| a2d | I feel safe about the privacy control of Internet vendors. | New item |
| Perceived Integrity | | |
| a3a** | Internet vendors will not charge Internet shoppers more for Internet shopping. | New item |
| a3b | Internet vendors are honest to their consumers. | Moorman et. al. 1993 |
| a3c | Internet vendors act sincerely in dealing with customers. | Moorman et. al. 1993 |
| a3d* | I will not be overcharged by Internet vendors during sales transactions. | New item |
| Perceived Competence | | |
| a4a | Internet vendors have the ability to handle sales transactions on the Internet. | New item |
| a4b | Internet vendors have sufficient expertise and resources to do business on the Internet. | New item |
| a4c | Internet vendors have adequate knowledge to manage their business on the Internet. | New item |
| a4d* | Most Internet vendors have a good reputation. | Doney & Cannon 1997 |
| Personality | | |
| b1a | It is easy for me to trust a person/thing. | New item |
| b1b | My tendency to trust a person/thing is high. | New item |
| b1c | I tend to trust a person/thing, even though I have little knowledge of it. | New item |
| b1d | Trusting someone or something is not difficult. | New item |
| Cultural Environment | | |
| b2a | A high degree of trust exists in my family. | New item |
| b2b* | People of my community trust each other. | New item |
| b2c | I am living in a high trust society. | New item |
| b2d** | My friends are generally trustworthy. | New item |
| Experience | | |
| b3a | Using the Internet has been a good experience to me personally. | New item |
| b3b | I have positive experiences of using the Internet. | New item |
| b3c | I have good experiences of using the Internet. | New item |
| Third Party Recognition | | |
| c1a | There are many reputable third party certification bodies available for assuring the trustworthiness of Internet vendors. | New item |
| c1b | I think third party recognition bodies are doing a good job. | New item |
| c1c | Existing third party recognition bodies are adequate for the protection of Internet shoppers' interest. | New item |
| Legal Framework | | |
| c2a** | The existing business code of conduct is sufficient for the protection of Internet shoppers' interest. | New item |
| c2b | The existing law is adequate for the protection of Internet shoppers' interest. | New item |
| c2c | The existing legal framework is good enough to protect Internet shoppers. | New item |
| Trust in Internet Shopping | | |
| d1a | Internet shopping is unreliable. | New item |
| d1b | Internet shopping cannot be trusted, there are just too many uncertainties. | New item |
| d1c | In general, I cannot rely on Internet vendors to keep the promises that they make. | Chow & Holden 1997 |
| d1d** | Anyone trusting Internet shopping is asking for trouble. | Chow & Holden 1997 |
| Perceived Risk | | |
| d2a | Internet shopping is risky. | New item |
| d2b | Shopping on the Internet entails uncertainty or vulnerability. | New item |
| d2c** | There are negative outcomes on Internet shopping. | New item |
| d2d | I find it dangerous to shop on the Internet. | New item |

* item removed after pilot test, ** item removed after field test

Appendix 2

| | | Degree of Agreement |
|-------------|-------------|---------------------|
| Interviewer | Interviewer | Kappa |
| 1 | 2 | 0.97 |
| 1 | 3 | 0.95 |
| 1 | 4 | 0.97 |
| 2 | 3 | 0.97 |
| 2 | 4 | 0.95 |
| 3 | 4 | 0.95 |

Table of Degree of Agreement – Kappa Coefficient

| ACTUAL CATEGORIES | | | | | | | | | | | | | TOTAL | TOTAL % |
|----------------------|-----|-----|----|----|-----------|----|----|-----|--------------------|----|--------|-------|---------|---------|
| TARGET CATEGORY | PSC | PPC | PI | PC | PER | CE | LF | TPR | PR | EX | T | TOTAL | TOTAL % | |
| PSC | 16 | | | | | | | | | | | 16 | 100.00 | |
| PPC | | 16 | | | | | | | | | | 16 | 100.00 | |
| PI | 2 | | 13 | | | | 1 | | | | | 16 | 81.25 | |
| PC | | | | 16 | | | | | | | | 16 | 100.00 | |
| PER | | | | | 16 | | | | | | | 16 | 100.00 | |
| CE | | | | | | 16 | | | | | | 16 | 100.00 | |
| LF | | 2 | 2 | | | | 8 | | | | | 12 | 66.67 | |
| TPR | | | | | | | | 12 | | | | 12 | 100.00 | |
| PR | | | | | | | | | 16 | | | 16 | 100.00 | |
| EX | | | | | | | | | | 12 | | 12 | 100.00 | |
| T | | | | | | | | | | | 16 | 16 | 100.00 | |
| Total Placement: 164 | | | | | Hits: 157 | | | | Overall Hit Ratio: | | 95.73% | | | |

Table of Item Placement Ratio

Keys:

PSC = Perceived Security Control

PPC = Perceived Privacy Control

PI = Perceived Integrity

PC = Perceived Competence

PER = Personality

CE = Cultural Environment

LF = Legal Framework

TPR = Third Party Recognition

PR = Perceived Risk

EX = Experience

T = Trust

Appendix 3 Factor Loading of the Measurement Instrument

| Measuring Items | Factor Loading |
|-----------------------------------|----------------|
| Perceived Security Control | |
| a1a | 0.749 |
| a1c | 0.769 |
| Perceived Privacy Control | |
| a2b | 0.572 |
| a2c | 0.671 |
| a2d | 0.651 |
| Perceived Integrity | |
| a3b | 0.555 |
| a3c | 0.796 |
| Perceived Competence | |
| a4a | 0.523 |
| a4b | 0.760 |
| a4c | 0.816 |
| Personality | |
| b1a | 0.794 |
| b1b | 0.784 |
| b1c | 0.756 |
| b1d | 0.717 |
| Cultural Environment | |
| b2a | 0.893 |
| b2c | 0.761 |
| Experience | |
| b3a | 0.762 |
| b3b | 0.920 |
| b3c | 0.823 |
| Third Party Recognition | |
| c1a | 0.588 |
| c1b | 0.755 |
| c1c | 0.669 |
| Legal Framework | |
| c2b | 0.822 |
| c2c | 0.863 |
| Trust | |
| d1a | 0.715 |
| d1b | 0.776 |
| d1c | 0.604 |
| Perceived Risk | |
| d2a | -0.818 |
| d2b | -0.637 |
| d2d | -0.616 |