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# The Impact of Web Assurance Seals on Consumer Trust

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## INTRODUCTION

Electronic commerce (e-commerce) is growing rapidly despite the overall dismal economy in recent years (U.S. Census Bureau 2004). However, e-commerce still has some important hurdles to overcome in order to approach its full potential due to its higher perceived risks than traditional channels of distribution (Van Den Poel and Leunis 1999; Bhimani 1996; Ford and Baum 1997; Griffin, Ladd, and Whitehead 1997). Risks associated with e-commerce lead to serious trust concerns in electronic markets (Hoffman, Novak, and Peralta 1999; Ba, Whinston, and Zhang 2000). A survey conducted by Consumer WebWatch in 2002 provided statistical support for the concerns: only 29% of those surveyed said they generally trusted e-commerce sites, whereas about 64% said they did not (Consumer WebWatch 2002).

Many sources advise online shoppers to do business with e-vendors that they know well (e.g. the first Internet tip offered by the Internet Fraud Watch is to "know who you're dealing with."<sup>1</sup>). Therefore, one of the most critical goals small companies must achieve in order to succeed in electronic markets is to effectively and efficiently induce consumers' trust (Stewart 2003).

One institutional cue that helps induce consumers' initial trust is to display Web assurance seals on the e-vendors' web sites that signal an e-vendor's trustworthiness (Wang, Beatty, and Foxx, 2004). These seals are provided by independent third parties. When clicked, a seal would provide detailed disclosures explaining the principles/criteria ensured by the seal issuer.

There are some recent researches on Web assurance seals (e.g., Noteberg, Christaane, and Wallage 2003; Kovar, Burke, and Kovar 2000; Odom, Kumar, and Saunders 2002; Kimery and McCord 2002; Cook and Luo 2003; Wang, Beatty, and Foxx 2004). However, understanding of the seals is still limited. Besides, little research has been done to explore the effectiveness of different seal functions on consumers' trust toward the e-vendors who display the seals.

Most of the third-party Web assurance seals are to serve one or more of the three basic functions: (a) assuring transactional security, (b) ensuring consumers' privacy, and (c) ensuring an e-vendor's business transaction integrity (Kimery and McCord 2002). This research will examine the impact of the preceding seal functions on consumers' trust toward an e-vendor that displays the seal(s). Hypothetical seals are used rather than real ones to isolate the effect of seal functions from the reputation of the seal providers. This proposed functional approach represents an initial step toward the understanding of the various main and interaction effects of the multi-dimensionality of seals.

The remainder of the paper is organized as follows. First, we review the existing literature related to trust and Web assurance seals. Then, the conceptual framework is presented and research methodology is described. We conclude with the discussion of our findings and suggestions for future research.

## LITERATURE REVIEW

Trust is recognized as a key factor to facilitate online transactions (e.g., Jarvenpaa, Tractinsky, and Vitale 2000; Gefen 2002; Stewart 2003; Gefen, Karahanna, and Straub 2003). Jarvenpaa, Tractinsky, and Vitale (2000) find a store's trustworthiness impacts consumers' perceptions of risk as well as their attitude toward and willingness to purchase from the store. Gefen (2002) proposes that both familiarity with and trust in an online retailer influence a consumer's intention to purchase from that retailer. Stewart (2003), in exploring how trust is transferred across hypertext links and from physical to virtual stores, suggests that consumers' willingness to buy from an online store is an outcome of both trust in that store and perceived Internet-related risk. Gefen, Karahanna, and Straub (2003) find that both consumers' trust toward an e-vendor and their assessment of the information technology play important roles in determining consumers' online purchase intention.

Concentrating on Web assurance seals, prior research, though limited in number, has generated some insights, but with diverse findings. Kovar, Burke, and Kovar (2000) empirically test the effect of one type of Web assurance seal, WebTrust. They find out that subjects who pay more attention to the seal disclosures at the retailer's web site, or who have been exposed to WebTrust advertising, have higher online transaction expectations and a stronger willingness to buy than their counterparts. Pennington, Wilcox, and Grover (2003) explore the possible impact of trust assurance seals on system trust in B2C transactions, but they find no significant impact. Similarly, findings from Kimery and McCord (2002) and Wang, Beatty, and Foxx (2004) do not reveal any significant relationship between Web assurance seals and consumers' trust. Most of the studies use an online survey quasi-experiment, not a lab-controlled experiment. This limitation might weaken the validity and reliability of the findings of the preceding studies.

This research classifies Web assurance seals into three types based on their functions: privacy assurance, security assurance, and transaction-integrity assurance seals. We use 2x2x2 full factorial design and a lab-controlled experiment to explore the main and interaction effects of different functions of the seals on consumers' trust toward an e-vendor. A web site of an e-vendor was established specifically for this research.

## CONCEPTUAL FRAMEWORK

Due to the lack of trust, consumers are reluctant to engage in an online transaction, let alone long-term relationships. Things are tougher for small, less established e-vendors, as size and reputation are two important antecedents to trust in a buyer-seller relationship either online or offline (Doney and Cannon 1997; Jarvenpaa, Tractinsky, and Vitale 2000).

Based on previous studies, the major concerns that consumers have toward online transactions include (1) the issues of privacy and security of the information (Miyazaki and Fernandez 2001), and (2) the issue of

transaction integrity, which reflects consumers' concern over an e-vendor's motivation and ability to handle order fulfillment (Noteberg, Christaane, and Wallage 2003; Kimery and McCord 2002). In practice, most Web assurance seals aim at addressing one or more of the above issues.

As discussed earlier, we categorize the various Web assurance seals according to the functionalities they serve. They can serve one or more of the follow three functions: privacy assurance, security assurance, and transaction-integrity assurance.

- **Privacy assurance.** A privacy assurance seal requires an e-vendor who displays such a seal discloses and complies with its online privacy practices. Personally identifiable information obtained as a result of electronic commerce is usually protected and handled as promised. TRUSTe serves an example for this category.
- **Security assurance.** Security assurance is to ensure the security of data transmitted over the Internet and stored within a vendor's e-commerce system. Usually some specific technologies and security procedures are employed to enable secure online ordering, payment handling, and secure storing of the confidential information. WebTrust security seal provides a good example of this service.
- **Transaction-integrity assurance.** A transaction-integrity seal requires an e-vendor comply with business practices disclosed in terms of complete and accurate transactions. In addition, the e-vendor is required to commit to high levels of ethical business practices and customer satisfaction. WebTrust and BBBOnline Reliability fall into this category.

These three functions served by various Web assurance seals address the perceived risks associated with online shopping. These seal functions are expected to relieve consumers' anxiety over online shopping and increase their trust toward the e-vendors that display the seal. Therefore we propose the following hypotheses:

**Hypothesis 1:** A seal promoting privacy will significantly increase consumers' trust toward the online store that displays the seal.

**Hypothesis 2:** A seal promoting security will significantly increase consumers' trust toward the online store that displays the seal.

**Hypothesis 3:** A seal promoting transaction-integrity will significantly increase consumers' trust toward the online store that displays the seal.

Meanwhile, some Internet vendors do display a Web assurance seal providing more than one function. For example, www.ubid.com displays AOL Certified Merchant seal that provides both privacy and transaction-integrity functions. When a Web assurance seal guarantees more than one function, we are not sure whether different functions would strengthen or weaken one another with regard to their impact on consumers' trust toward the e-vendor. This area has not yet been explored.

**Hypothesis 4:** A seal promoting both privacy and security will significantly increase consumers' trust toward the online store than a seal that promotes only one of the two functions.

**Hypothesis 5:** A seal promoting both privacy and transaction-integrity will significantly increase consumers' trust toward the online store than a seal that promotes only one of the two functions.

**Hypothesis 6:** A seal promoting both security and transaction-integrity will significantly increase consumers' trust toward the online store than a seal that promotes only one of the two functions.

**Hypothesis 7:** A seal promoting all three functions—privacy, security, and transaction-integrity will significantly increase consumers' trust toward the online store than a seal that promotes any two of the functions combined.

## METHODOLOGY

### Procedures

A 2x2x2 full factorial design was used in this research. A web site (www.goldsail.net) of a hypothetical online store was established to

implement the experiment. This online store carried various products such as textbooks, computers, and apparel. To simulate a real online shopping experience, such information as store history, customer service, return policy, contact information, and product descriptions were presented in the format of a real online store.

Thirty undergraduate students from a university in the U.S. were recruited on a voluntary basis for the pretest. According to the feedback from the pretest, modifications were made to the experiment web site and the questionnaires.

The experiments were conducted in other two institutions. Subjects were recruited on a voluntary basis. The full factorial design led to eight different versions of the web sites. All versions of the web sites were identical except for the trust-seals. In our control group, subjects were exposed to the e-vendor without a trust-seal. In all other seven groups, a seal was presented on the top of the web site with the same appearance yet different contents when clicked. A seal could be of one, two, or three functions. Subjects were assigned on a random basis to the eight different versions of the web site.

The first group visited the e-vendor with no seal. The second, third, and fourth groups visited the e-vendor with the seal promoting privacy, security, and transaction-integrity respectively. The fifth, sixth, and seventh groups visited the e-vendor with the seal promoting two functions: privacy and security, privacy and transaction-integrity, and security and transaction-integrity respectively. The eighth group visited the e-vendor with the seal that promoted all three functions.

Before the experiment started, we opened the web sites of each version on the computers. Then we asked the subjects to enter the computer lab and take a seat (without any allocation). The principle investigator (PI) opened the web site and showed it on the projector. Subjects were first given 10 minutes to explore the web site and to read through the related information (such as company description, customer services policy, contact information, and product description) about this e-vendor. For the seven groups that visited the e-vendor with a seal, the PI then asked them to visit the seal and read the description of the seal. After this, questionnaire was distributed to the subjects regarding their trust and purchase intention from the store. Later, another questionnaire was distributed asking for subjects' demographic information and personal Internet and online shopping experience. The experiment with the control group was run in a different time as subjects in this group visited the store with no seal.

We measure the perceived trust toward the e-vendor by 5 items on a 7-point likert scale, adapted from Doney and Cannon (1997) and Pennington, Wilcox, and Grover (2003). Cronbach alpha for this scale is .91.

## ANALYSIS AND RESULTS

The first three hypotheses are tested by independent sample t-tests, which compare the means of the construct of trust between the control group and group 2, 3, and 4 (with a seal assuring privacy, security, and transaction-integrity respectively). The results (Table 1) show that the differences between the control group and each of the above experiment groups are significant ( $p < .01$ ). Thus, hypotheses 1, 2, and 3 are strongly supported. Therefore, consumers' trust toward an e-vendor increases when the e-vendor displays a seal, whether the seal addresses the privacy, security, or transaction-integrity issue.

The results of the full factorial design are used to test hypotheses 4 through 7. The ANOVA results indicate that there is no three-way interaction but two significant two-way interactions: privacy by security ( $p = .01$ ) and privacy by transaction-integrity ( $p = .03$ ). A closer look at the privacy by security interaction discloses that the effect of the security function of a seal on consumers' trust varies with the presence or absence of the privacy function of a seal. When the privacy function is not present, the security assurance greatly increases consumers' trust in an online vendor. Trust measure improves from 4.43 to 5.28 on a 7-point scale (difference = .85). However, when the privacy function is present, the security assurance cannot significantly improve consumers' trust in the online vendor. Trust measure changes from 5.15

Table 1. Impact of Web Assurance Seals on Consumers' Trust (t-test results)

Seal Function	# of subjects	Mean	Std. Deviation	t	Sig.
Control Group No Seal	26	3.93	1.45		
Privacy	22	5.11	1.16	3.124	0.003
Security	22	5.02	1.21	2.851	0.007
Integrity	20	5.07	1.13	2.990	0.005

to 4.99 (difference = -.16). Interaction of privacy by transaction-integrity shows similar pattern. The interaction effect of privacy and security is presented in Figure 1, and the interaction effect of privacy and transaction-integrity is presented in Figure 2. Meanwhile, interaction of security by transaction-integrity is not significant ( $p = .298$ ).

With regard to the main effects, transaction-integrity is significant ( $p = .03$ ), security is marginally significant ( $p = .095$ ), and privacy is not significant ( $p > .1$ ). The non-significance of the main effect with regard to privacy could be impacted by the interaction of privacy by security and privacy by transaction-integrity. Hypotheses 4 through 7 are not supported.

## CONCLUSION, LIMITATION, AND FUTURE RESEARCH

This study provides insights to e-vendors who intend to employ or who have employed Web assurance seals. Our empirical results indicate that Web assurance seals are generally effective to signal the trustworthiness of an e-vendor who displays the seal(s). Various seal functions (privacy, security, and transaction-integrity assurance) are effective in promoting consumers' trust toward an e-vendor that displays a seal. To those e-vendors who want to comply to more than one criteria/principles assured by third independent trusted parties, our study suggest that the effects of privacy assurance and security assurance weakens one another, as does privacy assurance and transaction-integrity assurance. These findings may guide e-vendors on employing Web assurance seals.

As the study on trust assurance seals is still immature, more future studies can be done. In the current research, the trusted third-party is a hypothetical one. Subjects are informed that it is a trusted authority associated with Consumer Reports. In reality, different trust assurance seals are backed up by different organizations, and some are more reputable than others. Future research could explore the effect of third-party reputations on consumers' confidence toward the e-vendors who display the seal. Second, the experiment is implemented in a computer lab and subjects are asked to click on the seal and read its disclosure. In reality, many consumers may not pay attention to the seal (e.g. Kovar, Burke, and Kovar 2000). How consumers' involvement and their characteristics moderate the impact of trust assurance seals on consumers' trust and purchase intent toward the store is another area that needs further exploration. Third, in the current study, all the seven experiment groups are exposed to a single seal, which is placed at the same place

Table 2. Summary Table for 2x2x2 ANOVA Analysis of Variance (Dependent variable: Trust)

Source	Sum of Squares	df	Mean Square	F	Sig.
Intercept	4542.403	1	4542.403	3030.915	.000
Privacy	1.508	1	1.508	1.006	.317
Security	4.217	1	4.217	2.814	.095
Integrity	8.229	1	8.229	5.491	.020
Privacy by Security	10.109	1	10.109	6.745	.010
Privacy by Integrity	7.135	1	7.135	4.761	.030
Security by Integrity	1.632	1	1.632	1.089	.298
Privacy by Security by Integrity	.828	1	.828	.552	.458

of the web sites. The study of the seal itself (e.g. the place it is displayed on the online web site, its name, design, number of seals presented) is another future research direction.

## REFERENCES

- Ba, S., A. B. Whinston, and H. Zhang, "The dynamics of the electronic market: an evolutionary game approach," *Information Systems Frontiers*, 2000, 2(1), pp. 31-40.
- Bhimani, A., "Securing the Commercial Internet," *Communications of the ACM*, 1996, 39(June), pp. 29-31.
- Cook, David P. and Wenhong Luo, "The Role of Third-Party Seals in Building Trust Online," *E-Service Journal*, 2003, pp. 71-84.
- Consumer WebWatch 2002, "A Matter of Trust: What Users Want From Web Sites," Retrieved July 25, 2004, from <http://www.consumerwebwatch.org/news/report1.pdf>.
- Doney, Patricia M and Joseph P. Cannon, "An Examination of the Nature of trust in Buyer-Seller Relationships," *Journal of Marketing*, 1997, 61(April), pp. 35-51.
- Ford, W., and M. S. Baum, *Secure Electronic Commerce*, Prentice Hall, NJ, 1997.
- Gefen, D., "Customer loyalty in e-commerce," *Journal of the Association for Information Systems*, 2002, 3, pp. 27-51.
- Gefen, David, Elena Karahanna, and Detmar W. Straub, "Trust and TAM in Online Shopping: An Integrated Model," *MIS Quarterly*, 2003, 27(1), pp. 51-90.
- Griffin, K., P. Ladd, and R. Whitehead, "Internet commerce: security is still a concern," *The Review of Accounting Information Systems*, 1997, 2(1), pp. 67-71.
- Hoffman, D. L., T. P. Novak and M. Peralta, "Building Consumer Trust Online," *Communication of the ACM*, 1999, 42(4), pp. 80-85.
- Internet Fraud Watch 2003, "Fraud Trends: January-December 2003," Retrieved July 26, 2004, from <http://www.fraud.org/2003/internetcams.pdf>
- Jarvenpaa, S. L., N. Tractinsky, and M. Vitale, "Consumer trust in an Internet store," *Info. Tech. and Mgt*, 2000, 1(1-2), pp. 45-71.
- Kimery, K. M. and M. McCord, "Third Party Assurances: The Road to Trust in Online Retailing," Proceedings of the 35<sup>th</sup> Hawaii International Conference on System Sciences, 2002.
- Kovar, S. E., K. G. Burke, and B. R. Kovar, "Consumer responses to the CPA WEBTRUST assurance," *J. of Infor. Systems*, 2000, 14(1), pp. 17-35.
- Miyazaki, Anthony D. and Ana Fernandez, "Consumer Perception of Privacy and Security Risks for Online Shopping," *The Journal of Consumer Affairs*, 2001, 35(1), pp. 27-44.
- Noteberg, Anna, Ellen Christiaanse and Philip Wallage, "Consumer Trust in Electronic Channels: The Impact of Electronic Commerce Assurance on Consumers' Purchasing Likelihood and Risk Perceptions," *e-Service Journal*, 2003, 2(2), pp.46-67.
- Odom, M. D., A. Kumar and L. Saunders, "Web Assurance Seals: How and Why They Influence Consumers' Decisions," *Journal of Information Systems*, 2002, 16(2), pp. 231-250.
- Pennington, Robin, H. Dixon Wilcox, and Varun Grover, "The Role of System Trust in Business-to-Consumer Transactions," *Journal of Management Information system*, 2003, 20 (3), pp. 197-226.
- Stewart, K. J., "Trust Transfer on the World Wide Web," *Organization Science*, 2003, 14(1), pp. 5-17.
- U.S. Census Bureau 2004, "United States Department of Commerce News." Retrieved July 25, 2004, from <http://www.census.gov/mrts/www/current.html>.
- Van den Poel and Joseph Leunis, "Consumer Acceptance of the Internet as a Channel of Distribution," *Journal of Business Research*, 1999, 45, pp. 249-256.
- Wang, Cajun, Sharon E. Beatty and William Foxx, "Signaling the Trustworthiness of Small Online Retailers," *Journal of Interactive Marketing*, 2004, 18(1), pp. 53-69.

## ENDNOTES

- <sup>1</sup> Directly quoted from "Internet Fraud Tips from the National Consumers League's Internet Fraud Watch": <http://www.fraud.org/tips/internet/general.htm> (last accessed November 20, 2003).

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