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## **A DEMAND-SIDE EVALUATION OF WEB ASSURANCE SERVICES: AN EMPIRICAL STUDY ON AICPA/CICA WEBTRUST SERVICE**

Jiin-Feng Chen, National Chengchi University, Taiwan, jfchen@nccu.edu.tw  
Piin-Jier Wang, National Chengchi University, Taiwan, 94353025@nccu.edu.tw

### **ABSTRACT**

WebTrust service uses an approach similar to financial statements attestation to provide assurance services to web hosts. Prior research generally supports CPAs' qualifications and abilities in offering such services, but rarely explains the limited success of this endeavor. Based on a conceptual model, this study evaluates the demand side of web assurance services. Research questionnaires were used to gather information from consumers and business firms in Taiwan via the Internet. Our results show that consumers have fundamental understanding of web assurance seals and recognize the importance of web assurance services. However, only a portion of consumers are willing to pay additional costs for the assurance provided by web seals. In addition, CPAs have advantages in credibility and objectivity over other web assurance providers, and are more suitable in providing privacy assurance. An expectation gap exists, however, between consumers and web assurance providers. When offering such services, a provider may face the potential risk of lawsuit and should address the issue properly. The above results have implications for the WebTrust service providers in realigning their strategies in the web assurance market.

*Keyword:* WebTrust, web assurance services, web assurance seals

### **INTRODUCTION**

The WebTrust service was created through a joint effort between the American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA) in 1998. WebTrust uses an approach similar to the attestation of financial statements and provides assurance services to Web hosts. Utilizing the CPAs' reputations and independence and more complete coverage of its assurance services, WebTrust aims to establish its presence in the Web assurance market.

Prior research had concentrated mostly on the supply side of WebTrust service. Their results generally support the CPAs' qualifications and abilities in offering these services. It does not, however, help to explain the AICPA/CICA limited success with WebTrust. The purpose of this study, therefore, is to evaluate the demand side of web assurance services and to provide evidence on the feasibility of WebTrust service. The rest of this paper is organized as follows. Section II briefly reviews the literature on electronic commerce risk and web assurance services. Section III discusses the research design and methods for data collection and analysis. Section IV presents the empirical results. The final section provides conclusions of this study.

### **LITERATURE REVIEW**

With the rise of electronic commerce (EC), more businesses and consumers are using the Internet as one of their major transaction platforms. Consumers generally have, however, concerns over a number of EC issues, for example, integrity of business practices of web hosts, protection of consumer privacy, and protection of transaction data. [6] The above concern mostly results from the information asymmetry between the seller and the buyer due to their lack of knowledge with each other. One solution to this problem is the use of third-party assurance, such as a web seal, by Web hosts to signal the quality of their products and/or services to consumers. [4] [5]

Prior studies show mixed results on the effect of web seals as signaling tools. Miyazaki and Krishnamurthy [2] indicated that a third-party assurance seal did affect a consumer's trust and willingness in providing personal information to a web host. Kimery and McCord [1] found, however, that consumers were not familiar with three major web seals and the effect of these seals on consumer behavior was limited. That is, it would be difficult for consumers to appreciate the value of a web seal before they understand the purpose and functioning of web assurance services.

As a newcomer to the web assurance market, AICPA and CICA developed the WebTrust service in 1998. Their main strategy was to provide a fuller scope of services with coverage over three aspects of EC: business practice, transaction integrity and information protection. Two additional dimensions, i.e., legal environment and WebTrust seal management, were added later to account for the globalization of EC. The niche of WebTrust was to utilize CPAs' reputation for independence, objectivity and professionalism in providing assurance services.

The WebTrust service, however, did not meet the expectations of AICPA and CICA. Only a limited number of Web hosts are using the WebTrust seal. The main reasons for this lack of success include: (1) insufficient understanding of WebTrust by consumers and businesses due to ineffective marketing efforts, (2) expensive cost for obtaining and renewal of the WebTrust seal, and (3) stringent WebTrust service standards. By mid-2003, WebTrust was merged with another seal, SysTrust, into Trust services. [3] Past research focuses mainly on the supply side of web assurance services and may not provide a complete account for the above development. It is, therefore, worth studying the demand side of web assurance services to gain additional insights into the working of this market.

### **RESEARCH METHODS**

### Research Design

In providing web assurance services, WebTrust covers a wider spectrum of areas than other web seal providers, including security, availability, transaction integrity, confidentiality, and privacy. The value of WebTrust, however, depends on consumers' recognition and acceptance of web assurance services. Table 1 presents a matrix for the interaction of consumers' acceptance, WebTrust seal, and other web seals.

In scenario A, WebTrust and other web seals are in a competitive market for web assurance services. WebTrust must differentiate itself from other competitors to gain consumers' acceptance. If WebTrust provides new services not offered by others, as in scenarios B and C, then its major challenge would be to gain consumers' acceptance of such offerings. Scenario D indicates that WebTrust and other web seals do not provide the web assurance services valued by consumers. An expectation gap may result from such mismatch.

TABLE 1: Research Design

		Consumers' emphasis on specific web services			
		By WebTrust seal	By other web seals	Yes	No
Specific types of web services provided?	Yes	Yes		A	
		No		B	C
	No	No		D	

### Data Collection and Analysis

Research questionnaires were used to collect data from the potential users (consumers and business firms) of web assurance services via the Internet. This study used a demand-side model of web assurance services, as depicted in Figure 1, to develop the structure of and specific questions in the questionnaires.

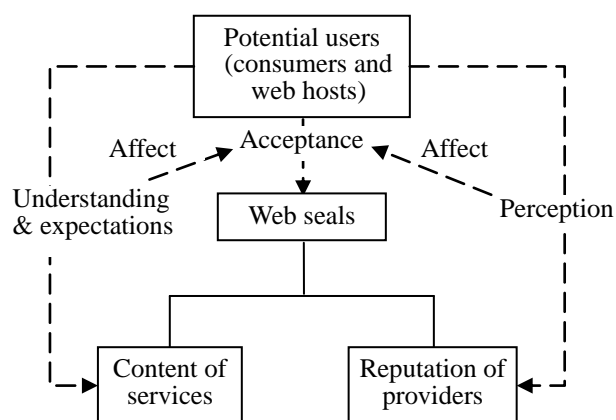


FIGURE 1: The Demand-side of Web Assurance Services

In the above model, any potential user's acceptance of a specific web seals depends on his/her perception of the provider's reputation as well as his/her understanding and expectations of the content of web assurance services. Therefore, the research questionnaires were divided into three sections. For consumers, the first section includes questions to determine the subject's knowledge and perception of web seals. Secondly, the subject is asked to evaluate the importance of five aspects of web assurance services to his/her Internet transactions and/or activities. He/she also indicated his/her willingness to pay for the above services and in what amount (in terms of percentage of the price of product/service attained). In the third section, the subject indicates his/her approval rating (on a 5-point Likert scale) of the chosen web seal regarding the provider's competitiveness in five dimensions. The subject was also asked to provide the following information for further analysis: age, gender, occupation, household income per month, hours spent on the Internet per week, and experience in Internet shopping.

The questionnaire for business firms was similar to the one for consumers with the following changes. Three irrelevant questions were removed from the first section. The second section asks the subject firm, instead, to evaluate consumers' emphasis on the five aspects of web assurance services as well as consumers' willingness to pay for such services. The third section includes an extra question on the subject firm's perception of CPAs' advantages over other web seal providers in offering different aspects of web assurance services. The subject firm also indicated its industry classification on the questionnaire.

In this study, the Cronbach  $\alpha$  and pre-tests were used to check the reliability and validity of research questionnaires. The statistical methods for our empirical data analysis include descriptive statistics, t-test, and ANOVA.

## EMPIRICAL RRESULTS

### *Validity and Reliability of Research Questionnaires*

To enhance the validity of research questionnaires, a number of graduate students with majors in Accounting and Management Information Systems were asked to pretest the questionnaires. Their suggestions were used to modify the questionnaires. For the questions with the Likert scale, their Cronbach  $\alpha$  values are between 0.714 and 0.932. Its acceptable value is generally 0.70 in social science. Therefore, the questionnaires are, in general, reliable.

### *Subject Profiles*

The research questionnaire for consumers was posted on the Internet to solicit responses from Internet users. To encourage responses, the respondent received a lottery number for gifts to be drawn at the end of whole survey. A total of 206 valid responses were collected. Table 2 summarizes the profiles of subjects.

TABLE 2: Subject Profiles

<b>Panel A: Age</b>					
< 18	19-24	25-30	31-40	>40	Total
15	70	62	40	16	203
7.4%	34.5%	30.5%	19.7%	7.9%	100%
<b>Panel B: Gender</b>					
Male		Female		Total	
99	48.5%	105	51.5%	204	100%
<b>Panel C: Occupation</b>					
Students	Self-employed	Business	Workers	Others	Total
81	37	30	23	35	206
39.3%	18%	14.6%	11.2%	17.4%	100%
<b>Panel D: Monthly income</b>					
< NT\$30,000	NT\$30,000 ~ NT\$49,999	NT\$50,000 ~ NT\$100,000	> NT\$100,000	Total	
102	61	26	14	203	
50.2%	30%	26%	6.95%	100%	
<b>Panel E: Weekly hours spent on the Internet</b>					
< 1 hr.	1-5 hrs.	6-10 hrs.	11-15 hrs.	>16 hrs.	Total
23	36	46	27	71	203
11.3%	17.7%	22.7%	13.3%	35%	100%
<b>Panel G: Experience in Internet shopping</b>					
Yes		No		Total	
181	89.2%	22	10.8%	203	100%

Table 2 shows that 65% of the subjects are between the ages of 19 to 30. It is consistent with the general findings that most Internet users are of younger generation. Most of them are students and, therefore, have low monthly income. There is no difference in gender. About a half of the subjects spend more than 10 hours per week on Internet and 89% of all subjects have experiences in Internet shopping. Therefore, the subjects, as a whole, have good understanding of EC and should be able to comprehend the questionnaire.

### *Knowledge and Perception of Web Seals*

The value of a web seal depends on users' knowledge and acceptance of its functions. If consumers are not aware of web seals or do not appreciate the assurances provided by them, then the market for web assurance services is limited. The first section of our questionnaire was, therefore, used to determine the subject's knowledge and perception of web seals. Over 70% of the subjects have correct ideas about the purpose, function and certification process of a web seal. They have more trust on a web host with proper seals. However, about a half of subjects do not know whether a web host has to pay for a web seal and 19% of them believe that the service is free.

### *Value of Web Assurance Services and Cost Consideration*

To succeed in the web assurance market, a web seal provider must consider users' perception of the seal's value and cost. Oversupply of services tends to increase the cost to a level that deters potential users. The second section of questionnaire aimed to determine the subject's valuation of five aspects of web assurance services, i.e. security, availability, integrity, confidentiality, and privacy. The average scores and t-test for these items are shown in Table 3.

**TABLE 3: Valuation of Web Assurance Services**

Item	N	Mean	Rank	Standard deviation	t-value
Security	199	4.20	2	0.89	18.88*
Availability	199	4.08	5	0.74	20.93*
Integrity	203	4.19	3	0.72	23.68*
Confidentiality	203	4.13	4	0.96	16.80*
Privacy	203	4.23	1	0.82	21.38*

\* p-value < 0.01.

For all the items in Table 3, their mean scores are above 4 (on a 5-point Likert scale). It shows that the subjects recognize the importance of these services. The item, “privacy”, receives the highest rank, followed by “security” and “integrity”. In addition, the subjects were asked to indicate the additional cost that they would pay for products or services offered by the web store assured with a web seal(s). Table 4 presents the results.

**TABLE 4: Cost Consideration for Web Seals**

<b>Panel A: Would be willing to pay extra for products or services offered by assured web stores?</b>						
Yes		No		Total		
97	49.2%	100	50.8%	197	100%	
<b>Panel B: Additional cost to pay in percentage of the price of a product or service?</b>						
< 5%		6-10%		> 11%		Total
82	84.5%	13	13.4%	2	2.1%	97 100%

As shown in Table 4, when there is an extra cost to consumers for web assurance, only about a half of the subjects would be willing to pay. And most of them prefer the additional cost to be less than 5% of the price of a product of service. As a result, web hosts may find difficult to transfer the cost of obtaining web assurance services to consumers. Since WebTrust provides a broader range of services with frequent renew, it usually costs higher than competitors. Therefore, the above results may, to some extent, help explain the limited success of WebTrust. To overcome the status quo of WebTrust service, AICPA and CICA may consider the realignment of their strategies toward the web assurance market, for example, by dividing WebTrust service to smaller parts, engaging more marketing efforts, and forming alliances with other web assurance providers.

#### *CPAs' Competitiveness in Providing Web Assurance Services*

To evaluate CPAs' competitiveness in providing web assurance services, the research questionnaire provides two local web seals, namely HiTrust and TWCA, with the WebTrust seal to the subjects. Each subject was asked to evaluate only one of the seal providers in regard to its credibility, objectivity, experience, professional skills, and EC knowledge (i.e., the qualification factors). Table 5 presents the overall ratings of these three providers.

**TABLE 5: Overall Ratings for Three Web Seal Providers**

<b>Panel A: Descriptive statistics</b>					
	Seal			Total	
	HiTrust	TWCA	WebTrust		
No. of obs.	63	59	63	185	
Mean	3.76	3.69	3.83	3.85	
Std. dev.	0.53	0.49	0.49	0.75	
<b>Panel B: ANOVA</b>					
Source	SS	DF	MS	F-value	p-value
Within- group	0.473	2	0.236	0.804	0.449
Between-group	53.472	182	0.294		
Total	53.945	184			

Based the results from ANOVA in Table 5, there was no significant difference in the overall ratings among the seal providers ( $p=0.449$ ). The average overall ratings range from 3.69 to 3.83 (close to the level of “agree”). In addition, each subject indicated whether the seal provider is suitable for providing web assurance services in security, availability, integrity, confidentiality, and privacy. WebTrust significantly outscores the other two providers in the approval rating for “privacy” and is more competitive in “credibility” and “objectivity”.

#### *Expectation Gap*

To determine whether there is any expectation gap between WebTrust service providers (i.e., CPAs) and consumers, our questionnaire asked the subjects to express their perception of the interrelationship among web seals, product quality, and the

financial health of web hosts. The subjects, in general, believe that a web seal provide guarantee to product quality as well as the financial health of a web host, with approval ratings of 3.92 and 3.28. In reality, most web assurance services do not cover these two aspects of web hosts. It implies that consumers may overly expect the coverage of web assurance services without obtaining sufficient information from the web seal providers. The existence of such an expectation gap may represent a significant challenge to the providers in offering their services.

### **Responses from Business Firms**

A total of 21 business firms replied to our research questionnaire (a response rate of 21%). The knowledge and perception of business firms on the importance of web assurance services is, in general, similar to those of consumers. Business firms believe, however, that CPAs are suitable in providing all aspects of web assurance services and have competitive advantage in the qualification factors for such services.

### **CONCLUSION**

Security, privacy and trust are among the important cornerstones for EC. Numerous web assurance providers offer certification of web hosts regarding their security and integrity. AICPA/CICA jointly launched the WebTrust service as a strategic tool to explore this new market with limited success. This paper empirically explores the demand side of web assurance market using the WebTrust service as an example. Our results show that consumers have fundamental understanding of web assurance seals and recognize the importance of web assurance services. However, only a portion of consumers are willing to pay additional costs for the assurance provided by web seals. In addition, CPAs have advantages in credibility and objectivity over two other web seal providers, and are more suitable in providing privacy assurance. There are expectation gaps, however, between consumers and web assurance providers. When offering such services, a provider may face the potential risk of lawsuit and should address the issue properly. The above results have implications for the WebTrust service providers in realigning their strategies in the web assurance market.

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