

## Measuring Trustworthiness toward Online Shopping Websites: An Empirical Study

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### Abstract

*This present study seeks to determine how customers assess trustworthiness when they shop in online. The study is based on primary data. For gathering primary data for the study, survey method has been used and a semi-structured questionnaire has been developed to investigate the online shoppers' perception of trust. The sample comprising of two hundred and thirty three respondents have been interviewed about how they would describe trustworthiness toward online shopping websites. In the first part of the questionnaire (Q1 to Q11) based on the respondents' experience in online shopping, shopping frequency and their own judgments about how they can assess the trustworthiness of a website when they use for online shopping. In the second part of the questionnaire, the respondents are requested to indicate their opinions on the "strongly agree" to "strongly disagree" scale with a list of twenty three adjectives while evaluating the specific sites. Two factors such as "Credibility" and "Looks unique" have also been identified and analyzed in the study. Higher trust toward an online shopping website will generate more favorable attitudes of the consumers about online shopping, products and the companies, and increase the purchase on a regular basis. Therefore, online marketers should minimize the risks perceived by potential shoppers so that shoppers can interact correctly with the system without interruption and can be satisfied.*

**Key Words:** Trustworthiness, Online shopping, Website, Credibility, Looks unique.

### Introduction

The year 1998 saw a breakthrough of online commerce buying by modem (Chen and Well, 1999). Online shopping website may gradually become substitute for conventional retailing channels, such as mail, phone-order stores, catalogs and sales forces (Yoo and Donthu, 2001). As online use grows, the number of people shopping at virtual malls is also increasing rapidly. Several observers predict that online commerce might replace the traditional pattern of shopping in the near future (Nam et al., 2002). However, as the importance of, and competition among online shopping websites increase, the quality of the websites will become crucial for survival and success. As online shopping gradually moves from a novelty to a routine way of shopping, the quality of online shopping websites will play a significant role in differentiating websites. Online shopping website must be of high quality to attract more browsers and shoppers than competing

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low quality websites because quality builds sustainable competitive assets (Yoo and Donthu, 2001). Online channel is a very new and unknown way of doing shopping; it makes the foundation of “trust” even more difficult and critical because the trust affects lots of essentials to online transactions, such as privacy and security. Online commerce success largely depends on gaining and maintaining the trust and confidence of online shoppers. It is necessary to understand how risk and trust affect the purchasing decisions made on the online. Risk can be defined as the individual’s perception of likelihood of loss associated with purchasing the product offered (Kahneman and Tversky, 1979). This study seeks to determine how customers assess trustworthiness when they use online shopping websites. In this point of view, making the online shopping site a place where all kinds of online shoppers can safely and easily find out products and services information and make final purchase decision. This study also investigate how, whether, and which elements of websites interface design can help, influence and contribute or affect to building trustworthiness with online shoppers in online commerce.

### **Definition and Classification of Online Shopping Sites**

Online websites can be classified into the following six retail models:

- i) **Manufacturer sites:** Manufacturer sites in which manufacturers directly sell their products to customers via online, skipping wholesalers and retailers, such as: Sony.Com, Compac.com, Hoover.com etc.
- ii) **Off-line sites:** Offline retailer sites in which physical stores make their retail products available on the online, such as Bestbuy.com, Walmart.com, Officedepot.com etc.
- iii) **Catalog hybrid sites:** Catalog hybrid sites that put their printed catalog on the online, such as Fingerhut.com, Columbiahouse.com, Christianbook.com etc.
- iv) **Pure.com:** Pure.com retail sites that buy products from manufacturers at wholesale and sell them online at retail without owning physical and public stores, such as Amazan.com, etoys.com, buy.com etc.
- v) **Mall sites:** Mall sites that develop a location on the online and make money by charging retailers fees, such as shopping yahoo.com, MySimon.com etc.
- vi) **Brokerage site:** Brokerage sites that unite buyers and sellers on the online and charge a portion of transaction for the service, such as eBay.com, Ameritrade.com, PriceLine.com etc.

### **Literature Review**

Fogg et al. (2001) have compiled overall design implications, each of which will help boost online shopping website trustworthiness—make shopping website easy to use, appearance matter, make sure everything works, convey the real world aspect of the organization, include makes of expertise, tailor the user experience, avoid overly commercial elements on a website etc.

Swan, Bowers and Richardson (1999) mentioned most online shoppers need to initiate their trust prior to purchase, it is reasonable to conceptualize the cue-based trust at the first: some cue-based trust feature—describe the company’s achievements, address trustworthiness concerns up front,

communicate the online merchant's value, contractual terms, provide means of contact, provide feedback about the order, provide an effective after sale services etc.

Stanford Guidelines for online trustworthiness make it easy to verify the accuracy of the information, show that there is a real organization behind website, honest and trustworthy people stand behind the website, design website looks professional, update online website's content often, avoid errors of all types, disclose cost and policies relevant to online shoppers, comments from satisfied customers etc.

Stanford Persuasive Technology Lab (2002) has investigated what makes web sites credible today: The website has proven useful before, lists the organization's physical address, give a contact phone number, contact e-mail address, believable links to the website, state its privacy policy, link to outside materials and sources, the website is recommended by the news media, a friend recommended the website, the website lists well-known corporate customers, the website is by an organization that is well respected, the website has been updated, the website looks professionally designed, the website is arranged in a way that makes sense to you, design is appropriate in its subject matter, provide printer friendly pages, live chat with a company representative, designed for online commerce transactions, requires register, has a commercial purpose, hosted by third party, links to a site thinks is trustworthy, the website is difficult to navigate etc.

Wolfe (1998) identified basic criteria to evaluate the online shopping websites: If online shoppers don't know who is writing the information, online shoppers can't trust the online shopping websites. Website should clearly disclose their purpose and mission, completeness of the information presented; easy to use the website etc. these are the basic criteria to evaluate online shopping websites.

Quelch and Klein (1996) identified the conditions on a website that will decrease its trustworthiness and should therefore be avoided: an unclear message, website that is overloaded with products and services. So online buyers are confused, no guarantees, no contract information, not returning calls, e-mail or letters, unappealing appearance etc. losing trusts quickly.

### **Objectives of the Study**

The specific objectives of the study are as follows:

- i. To explain the interface design issue of trustworthiness that is related to the design of the website.
- ii. To seek to determine how customers assess trustworthiness when shopping online.
- iii. To find out how the online shopping website can be safe and easy and provides products and services information to make final purchase decisions for online shoppers.
- iv. To focus on what online shoppers do and what online shoppers should do for safely online shopping.

- v. To investigate how, whether and which elements of website's interface design can help and influence on building trustworthiness for online shoppers.
- vi. To find out the different aspects of trust and various trusts building measures for the development of customer relationships and retaining profitable online shoppers on the online.

### Research Methodology

The study is based on primary data. The sample size has been determined for collecting primary data using convenience sampling technique. The primary data and information have been collected by using survey method through a set of semi-structured questionnaire including the five point Likert scale containing 5=strongly agree, 4=agree, 3= Indifferent, 2=disagree, 1=strongly disagree from selected two hundred and thirty three graduate students of the different disciplines of the Graduate School of Economics, Osaka University, Japan. The respondents are mainly online users as well as online shoppers visiting different websites. The sample for the study represents a significant proportion of the online population. Many researchers have conducted research physically. In those cases their sample sizes were from one hundred to three hundreds. For example, Chen and Wells (1999) have selected one hundred and twenty students as a sample. An actual survey probably would have a sample size of one hundred to four hundred respondents (Aaker, Kumar and Day, 1997). For the study, one hundred three online shopping websites have been selected in a convenient manner from two sources:

- i. Online shopping website URL Sources Book and
- ii. Friends recommending the number of online shopping websites which liked the most to shop or surf to get a clear picture of the trustworthiness of that site or sites.

Moreover, to measure the trustworthiness toward the online shopping websites, the respondents have answered in the questionnaire after visiting that pre-selected online shopping websites. However, twenty three adjectives have been used in the questionnaire to enable the respondents to measure the appearances of websites for the purpose of the study. Statistical software "MINI TAB" has been used for analyzing the data in this study.

### Findings and Analysis of Data

For the purpose of the study, the authors of the study pre-tested the questionnaire and prepared a complete questionnaire. The first part of the questionnaire was designed through eleven questions to collect and evaluate the previous online shopping experience, frequency of online shopping, becoming not a victim of the online fraud, to see if online shopper can judge the trustworthiness of a shopping site or not by seeing it at a glance etc.

**Table-1: Proportion of experienced and non-experienced respondents**

Having experience or not	Respondents number	Percentage
Have experience	82	35.19%
Have not experience	151	64.81%

Source: Computed from primary survey

The Table-1 shows that 64.81% respondents have no previous online shopping experience. On the other hand, 35.19% respondents have previous online shopping experience among them. Among these eleven questions, Q 5 focuses on the trustworthiness of an online shopping website.

**Table-2: A site's trustworthiness is by seeing it at one glance**

Judge Capacity	Respondents number	Percentage
Can not judge	181	77.68%
Can judge	52	22.32%

Source: Computed from primary survey

Here, Table-2 shows that 77.68% respondents can not judge trustworthiness of an online shopping website by seeing it at a glance but 22.32% respondents can judge this. Again, the in the questionnaire was designed through six expressions that were asked to the respondents.

In the second part of the questionnaire, the respondents are requested to indicate their opinions on the "strongly agree" to "strongly disagree" scale with a list of twenty three adjectives while evaluating the specific sites. Two factors such as "Credibility" and "Looks unique" have been identified also to get the findings.

#### **a. Correlation assessment through Pearson Correlation Coefficient among the Six Expressions**

The purpose at this stage is to assess correlation among the six expressions. As a result, the Pearson correlation coefficient has been used to measure the degree of relationships.

**Table-3: Correlation matrix among the six expressions**

	Q 6	Q 7	Q 8	Q 9	Q 10
Q 7	0.243				
Q 8	0.340	0.263			
Q 9	0.443	0.163	0.293		
Q 10	0.270	0.238	0.265	0.407	
Q 11	0.468	0.317	0.228	0.321	0.236

Source: Computed from primary survey

The correlation matrix in the Table-3 shows that these correlations are all positive and low. It indicates the presence of multidimensional of data.

#### **b. Principal Component analysis**

To further test the multidimensionality, the principal component method has also been used to analyze the data. Principal component analysis is used to help to understand data structure. The following table-4 presents the Eigen analysis of the Correlation Matrix:

**Table-4: Eigen analysis of the correlation matrix**

	PC1	PC2	PC3	PC4	PC5	PC6
Eigen value	2.517	0.895	0.829	0.749	0.538	0.472
Proportion	0.420	0.149	0.138	0.125	0.090	0.079
Cumulative	0.420	0.569	0.707	0.832	0.921	1

Source: Computed from primary survey

Here, Table-4 shows that the first principal component has variance (Eigen value) 2.517 and accounts for 42% of the total variance. The second principal component has variance (Eigen value) 0.895 and accounts for 14.9% of the total variance. The third principal component has variance (Eigen value) 0.829 and accounts for 13.8% of the total variance. The fourth principal component has variance (Eigen value) 0.749 and accounts for 12.5% of the total variance. The fifth principal component has variance (Eigen value) 0.538 and accounts for 9% of the total variance. The sixth principal component has variance (Eigen value) 0.472 and accounts for 7.9% of the total variance. Together, the first two principal components represented 56.9%. The remaining principal components account for a small proportion of the variability. Lastly we calculated the coefficient alfa is 0.61 approximately. These findings together indicate that these six expressions are multi-evaluative dimensions to measure the trustworthiness toward the online shopping websites.

**Table-5: Result of Principal component analysis (Q 6 to Q 11)**

Variables	PC1	PC2	PC3	PC4	PC5	PC6
Q 6	-0.467	-0.033	- 0.437	0.200	- 0.130	0.7 29
Q 7	-0.337	0.711	0.370	- 0.283	- 0.403	0.0 43
Q 8	-0.380	0.047	0.409	0.783	0.208	- 0.1 74
Q 9	-0.440	-0.497	- 0.095	- 0.076	- 0.589	- 0.4 45
Q 10	-0.386	-0.393	0.480	- 0.478	0.430	0.2 30
Q 11	-0.425	0.301	- 0.516	- 0.183	0.495	- 0.4 30

Source: Computed from primary survey

Here, Table-5 shows that these findings together indicate that these six expressions are multi-evaluative dimensions to measure the trustworthiness toward the online shopping websites.

**c. Adjective analysis:** The study pre-tested the adjectives and finally developed a consensus with twenty-three adjectives that describe the online shopping websites trustworthiness using five point Likert scale.

**Table-6: Result of correlation analysis of twenty three adjectives****First part:**

	<b>Trustworthiness</b>	<b>Credible</b>	<b>Persuasive</b>	<b>Protective</b>	<b>Relevant</b>
Credible	0.668				
persuasive	0.593	0.461			
Protective	0.492	0.430	0.466		
Relevant	0.525	0.617	0.544	0.401	
Secure	0.639	0.589	0.338	0.426	0.374
Informative	0.450	0.364	0.446	0.203	0.413
Interest	0.275	0.146	0.352	0.136	0.268
Knowledge	0.210	0.345	0.380	0.197	0.368
Neat & clean	0.188	0.187	0.305	0.242	0.256
Appealing	0.365	0.341	0.443	0.229	0.362
Attractive	0.361	0.273	0.452	0.113	0.420
Cheerful	0.094	-0.016	0.200	0.071	0.211
Convincing	0.543	0.544	0.741	0.496	0.574
Fair	0.447	0.341	0.364	0.412	0.454
Friendly	0.174	0.032	0.112	0.073	0.199
Lively	0.323	0.205	0.294	0.184	0.274
Organize	0.568	0.475	0.468	0.380	0.492
Easy to see	0.301	0.292	0.313	0.227	0.352
Honest	0.572	0.539	0.480	0.443	0.520
Pleasing	0.229	0.025	0.180	0.217	0.114
Realistic	0.396	0.465	0.380	0.252	0.285
Looks unique	0.374	0.218	0.305	0.140	0.288

**Second part:**

	<b>Secure</b>	<b>Informative</b>	<b>Interest</b>	<b>Knowledge</b>	<b>Neat and clean</b>
Secure					
Informative	0.344				
Interest	0.139	0.592			
Knowledge	0.090	0.336	0.415		
Neat & clean	0.179	0.103	0.093	0.073	
Appealing	0.274	0.421	0.494	0.312	0.245
Attractive	0.242	0.512	0.643	0.305	0.160
Cheerful	0.020	0.278	0.560	0.143	0.013
Convincing	0.312	0.355	0.301	0.395	0.373
Fair	0.298	0.257	0.192	0.253	0.189
Friendly	0.194	0.272	0.428	0.013	0.038
Lively	0.180	0.335	0.481	0.174	0.023
Organize	0.342	0.436	0.222	0.299	0.229
Easy to see	0.250	0.266	0.408	0.318	0.319
Honest	0.405	0.223	0.074	0.294	0.214
Pleasing	0.106	0.429	0.577	0.192	-0.051
Realistic	0.341	0.153	-0.006	0.253	0.220
Looks unique	0.104	0.386	0.524	0.232	-0.017

**Third part:**

	<b>Appealing</b>	<b>Attractive</b>	<b>Cheerful</b>	<b>Convincing</b>	<b>Fair</b>
Appealing					
Attractive	0.612				
Cheerful	0.534	0.596			
Convincing	0.485	0.350	0.263		
Fair	0.118	0.140	-0.070	0.382	
Friendly	0.402	0.455	0.652	0.094	0.001
Lively	0.445	0.506	0.661	0.249	0.077
Organize	0.313	0.273	0.010	0.378	0.382
Easy to see	0.349	0.430	0.237	0.316	0.096
Honest	0.305	0.146	-0.027	0.455	0.532
Pleasing	0.414	0.535	0.619	0.124	0.079
Realistic	0.190	0.072	-0.123	0.386	0.427
Looks unique	0.452	0.488	0.464	0.311	0.068

**Fourth part:**

	<b>Friendly</b>	<b>Lively</b>	<b>Organize</b>	<b>Easy to search</b>	<b>Honest</b>
Friendly					
Lively	0.683				
Organize	0.028	0.282			
Easy to see	0.057	0.264	0.365		
Honest	-0.028	0.022	0.350	0.337	
Pleasing	0.599	0.575	0.117	0.300	0.065
Realistic	-0.127	-0.015	0.409	0.188	0.430
Looks unique	0.368	0.475	0.150	0.349	0.227

**Fifth part:**

	<b>Pleasing</b>	<b>Realistic</b>
Realistic	-0.087	
Looks unique	0.594	0.150

Source: Computed from primary survey

#### d. Principal Component Analysis of Twenty Three adjectives

Principal component analysis of the scores of these twenty three adjectives are given below in Table-7 (from first part to third part):

**Table-7: Result of principal component analysis of twenty three adjectives**

**First part:**

	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
Eigen value	7.967	3.728	1.305	1.125	0.935	0.904	0.857	0.763
Proportion	0.346	0.162	0.057	0.049	0.041	0.039	0.037	0.033
Cumulative	0.346	0.508	0.565	0.614	0.655	0.694	0.731	0.765

**Second part:**

	PC9	PC10	PC11	PC12	PC13	PC14	PC15	PC16
Eigen value	0.707	0.677	0.614	0.500	0.464	0.388	0.343	0.329
Proportion	0.031	0.029	0.027	0.022	0.020	0.017	0.015	0.014
Cumulative	0.795	0.825	0.851	0.873	0.893	0.910	0.925	0.939

**Third part:**

	PC17	PC18	PC19	PC20	PC21	PC22	PC23
Eigen value	0.282	0.241	0.224	0.209	0.171	0.141	0.126
Proportion	0.012	0.010	0.010	0.009	0.007	0.006	0.005
Cumulative	0.952	0.962	0.972	0.981	0.988	0.995	1.000

Source: Computed from primary survey

Here, Table-7 shows that the first principal component has Eigen value 7.967 and accounts for 34.6% of the total variance. The second principal component has Eigen value 3.728 and accounts for 16.2% of the total variance. The third principal component has Eigen value 1.305 and accounts for 5.7% of the total variance. The fourth principal component has Eigen value 1.125 and accounts for 4.9% of the total variance. Together the first two principal components represent 50.8% of the total variability. Thus most of the data structure can be captured in two underlying dimensions. The remaining principal components each account for a small proportion of the variability and are probably unimportant.

**e. Factor Analysis:** Factor analysis like principal components analysis has been used to summarize the data structure in a few dimensions of the data. The goal of factor analysis is to find out a small number of factors that explains most of the data variability. The result 34.6%, 16.2%, 5.7%, 4.9%, 4.1%, 3.9% from principal component analysis has indicated the first, second, third, fourth, fifth and sixth respectively. There is a drop in variance explained in the third factor. So the third factor can be dropped. Therefore, this study has identified the following two factors.



## Conclusion

The study has examined how the respondents can judge the trust carrying attributes when shopping from a particular online shopping website. The study has found out the trust related dimensions which boost up the trustworthiness toward the online shopping websites. Various literatures have acknowledged that trust is one of the important factors for success of online shopping. Lack of trust is a significant problem in online commerce. Surveys of online user attitudes have consistently revealed that lack of trust is a key impediment to shoppers making transactions on the online. Numerous research articles have identified a large number of issues of performance, usability, security, and privacy etc. that have a considerable impact on online shoppers' perceptions regarding trust. The study has also found out multidimensional data by assessing correlation and principal component analysis. The factor analysis of the survey data has confirmed that those two factors- "Credibility" and "Looks unique" affect online shoppers' perception of trust in online shopping system. Higher online shoppers' trust toward an online shopping website will generate more favorable attitudes towards shopping at that online shopping website. Favorable attitude towards an online store will also help to increase the online shoppers' willingness to purchase from that online website. Online merchants should decrease the risk perceived by potential shoppers by allowing them to make sure that they will be able to interact correctly with the system and will be satisfied.

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### **Appendix-1**

**Questionnaire for the study titled 'Measuring Trustworthiness toward Online Shopping Websites:  
An Empirical Study'**

*[Information given will be strictly confidential and will only be used for academic purpose. Your cooperation in providing information will be highly appreciated.]*

**Please put a tick and fill in where applicable**

- |   |     |    |
|---|-----|----|
| Q1. Have you ever shopped on online?  | Yes | No |
| Q2. If yes, how many times within one month/ six months/ one year?                  |     |    |
| Q3. What kind of products do you purchase usually? Book/Computer/Software/Cosmetics |     |    |
| Q4. Have you ever been deceived by online shopping?                                 | Yes | No |
| Q5. Can you infer a site's trustworthiness by seeing it at a glance?                | Yes | No |
| Q6. Do you feel comfortable in searching websites?                                  | Yes | No |
| Q7. Are you satisfied with services provided by websites?                           | Yes | No |
| Q8. Can websites make it easy to communicate?                                       | Yes | No |
| Q9. Do you get available up-to date information?                                    | Yes | No |
| Q10. Can you encryption of consumer information?                                    | Yes | No |
| Q11. Do you go back at the same website in future again?                            | Yes | No |

### Appendix-2

**Please circle the number on the scale which best matches your opinion and experience.**

Adjectives	Strongly Disagree (1)	Disagree (2)	Indifferent (3)	Agree (4)	Strongly Agree (5)
Credible	1	2	3	4	5
persuasive	1	2	3	4	5
Protective	1	2	3	4	5
Relevant	1	2	3	4	5
Secure	1	2	3	4	5
Informative	1	2	3	4	5
Interest	1	2	3	4	5
Knowledge	1	2	3	4	5
Neat & clean	1	2	3	4	5
Appealing	1	2	3	4	5
Attractive	1	2	3	4	5
Cheerful	1	2	3	4	5
Convincing	1	2	3	4	5
Fair	1	2	3	4	5
Friendly	1	2	3	4	5
Lively	1	2	3	4	5
Organize	1	2	3	4	5
Easy to see	1	2	3	4	5
Honest	1	2	3	4	5
Pleasing	1	2	3	4	5
Realistic	1	2	3	4	5
Trustworthiness	1	2	3	4	5
Looks unique	1	2	3	4	5