Antecedents of Customer Satisfaction on the Internet: An Empirical Study of Online Shopping

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Abstract

With the ever increasing popularity of electronic commerce, the evaluation of antecedents and of customer satisfaction have become very important for the cyber shopping store (CSS) and for researchers. The various models of customer satisfaction that researchers have provided so far are mostly based on the traditional business channels and thus may not be appropriate for CSSs. This research has employed case and survey methods to study the antecedents of customer satisfaction. Though case methods a research model with hypotheses is developed. And through survey methods, the relationships between antecedents and satisfaction are further examined and analyzed. We find five antecedents of customer satisfaction to be more appropriate for online shopping on the Internet. Among them homepage presentation is a new and unique antecedent which has not existed in traditional marketing.

Keywords: Electronic commerce; Cyber shopping store (CSS); Customer satisfaction; Service quality

1. Introduction

The Internet population has been exploding. The World Wide Web (WWW) users have been multiplying so rapidly and have widely spread into all walks of life. The use of the Internet is no longer limited to those computer nerds who do it for fun or curiosity. It has opened up tremendous business opportunities for its users. “Electronic Commerce”, the term first used by Kalakota and Whinston [1], has become the most important trend for doing business in the 21\textsuperscript{st} century. Two prominent examples are the American Commercial Alliance in Silicon Valley and the Federal Government’s use of Internet for purchasing. In Japan, hundreds of million U.S. dollars have been invested in setting up networks for promoting electronic commerce. In Taiwan, the National Information Infrastructure (NII) project has been undertaken by the Commerce Department of the Ministry of Economic Affairs for similar pursuits. The Department has even set up the “Electronic Commerce Alliance” to strengthen the coordination among the manufacturers of the cyber shopping store (CSS).

This latest trend has received nearly unanimously affirmative response from the business world. The belief is that the scope of the market will be multiplied through this new form of contacting business. Electronic Commerce, according to Kalakota and Whinston [1], is composed of two parts: (1) between enterprises and customers, and (2) among enterprises. For the time being, most businesses which use CSSs to concentrate usage on the first part. Practically all Internet users are their potential customers. Whether or not they can convert their potential customers into real ones and retain them depends, to a very large extend, on the service they offer and the customer satisfaction consumers perceive [2,5]. Customer satisfaction of course is a critical issue in the success of any business system, traditional or CSS. Churchill and Surprenant, Tse and Wilton, and Oliver [2,3,5] have presented their ways of the modeling of customer satisfaction. Among them, one such study [5] proposed antecedents (expectations and disconfirmation) and consequences (e.g., intention to purchase) of customer satisfaction. However, these studies were based on traditional channels (e.g., retail stores). Whether or not these results are appropriate for the CSS of electronic commerce still remains to be seen.

This paper is intended to explore the antecedents of customer satisfaction and to examine the relationships between customer satisfaction and the antecedents of the CSS. Here we use two major methods: case and survey. Through the case method, we begin by attempting to apply the antecedents we have adopted from the existing literature [1-5] on customer satisfaction to the CSS during our interviews with them. Their responses to our questionnaire, their ideas as to what really matter to their customers and the
discussions between us give us valuable data from which our antecedents of customer satisfaction, through our analysis, are derived. A research model is thus established with a series of hypotheses. All of these antecedents, the research model and hypotheses are further examined and analyzed through our survey method.

The remainder of this paper is organized as follows. In section 2, the literature on electronic commerce and customer satisfaction is reviewed. In section 3, the research methodology is outlined. Section 4 covers the research model and some hypotheses. In section 5, a research design is developed for our survey. It is verified in our data analysis in section 6. This study is concluded with our findings and limitations as well as implications in section 7.

2. Literature Review

2.1. Electronic Commerce

Kalakota and Whinston [1] defined electronic commerce as one kind of modernized business methodology. It seeks to reduce the costs, to improve the products and service quality, and to increase transmitting speed. In addition, it divides the application of consumption guide into four parts: (1) entertainment, (2) financial service and information, (3) the necessary service (i.e., home shopping), and (4) education and training. Why does an enterprise go on the Internet? According to Dahl and Lesnick [6], there are four marketing reasons for businesses to go on the Internet: (1) attracting customers more easily, (2) improving customer service, (3) collecting the customers’ information and (4) reserving the competitive power.

What kinds of products and services should the CSS offer the ever increasing shoppers on the Internet? Books and CDs are the easiest products to make a transaction, easier than houses and automobiles as Kotha [23] found out in 1998. CSS, according to Burke [24] and Kotha [23], has the advantage of offering a great variety of goods and, at a lower price, which, as the case of Amazon show, is still an important factor. The system software that the CSS has been using, according to Batty and Lee [7], is inadequate in understanding and comparing products on the network. Therefore, they developed a prototype system based on object-oriented design methods. This system will enable the sellers to improve their product presentation and the customers to better understand the products. Most of the groupwares so far, in the opinion of Barue et al. [8], are not satisfactory. Therefore, it is necessary to try this application on the opening environment of the Internet or Intranet.

The quality of service rendered during the course of the whole transaction has significance influence on the customer satisfaction. There are two parts in the course of handling a transaction; inside of the CSS and outside of the CSS [9]. In the inside part, according to Hill [9], there are six processes: (1) communication, (2) helping, (3) product developing, (4) operational, (5) marketing and sales, and (6) helping customers. Different electronic communities may require different prototype systems to explain this concept. The outside part of handling a transaction involves mainly the supply chain management. The factors of the management include different types, functions and locations of the storage, the costs of supply chain management and the customers’ service [10]. There is a key element in such a management: the intermediary between the manufacturers and customers. Sarkar et al. [11] regarded the intermediary as valuable and suggested that cybermediaries such as searching service, shopping centers and publishers are a new type of intermediaries.

2.2. Customer Satisfaction

The concept of customer satisfaction occupies a central position in marketing thought and practice [2]. Satisfaction is important to the individual consumer because it reflects a positive outcome from the outlay of scarce resources and/or the fulfillment of unmet needs [12]. Hence, the researchers have focused on discussions of the determinants of customer satisfaction. Churchill and Surprenant [2] urged disconfirmation as an intervening variable affecting satisfaction and that the effect of disconfirmation is adequately captured by expectation and perceived performance. They used experimental procedures and processed two types of products: a durable and a nondurable good. The results suggested the effects are different for the two products. Rather, that satisfaction was determined solely by the performance of the durable good.

Tse and Wilton [3] followed the results proposed by Churchill and Surprenant, and investigated customer satisfaction formation. Results of a laboratory experiment suggested that perceived performance exerted direct significant influence on satisfaction in addition to those influences from expected performance and subjective disconfirmation. However, expectation and subjective disconfirmation seem to be the best conceptualization in capturing customer satisfaction formation. Besides this, there is a two-measure instrument of customer satisfaction [13]. They include the ratio and difference between perceptions and expectations. Cooper et al. [13] have adapted the SERVQUAL instrument designed by Parasuraman, Zeithaml and Berry [14] and compared these two instruments. The investigation found that the ‘ratio of perceptions’ and expectations resulted in a scale with
lower reliability, lower relative validity, and had dimensions that were more difficult to interpret than the scale developed using the ‘differences of perceptions’.

The research model presented by Parasuraman et al. [15,16] has been a popular way of measuring service quality. They chose four lines of business for research: bank, credit card company, securities company, and products maintenance company. In-depth interviews with employees of these companies and focus group interviews with their customers were conducted. This research found there are five gaps of service quality between customers’ expectation and actual performances, and suggested ten determinants of service quality. These determinants included reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customers, and tangibles. All are to be proved in further research. Moreover, Parasuraman et al. [14] presented their measurement scale of SERVQUAL, which include five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Further empirical research was also undertaken on other targets: telephone companies, insurance companies, and banks in order to confirm the reliability and validity of the model. Among the 22 questions only a few words needed to be modified. The revised questionnaire had high reliability and validity. SERVQUAL has also proved to be an effective and appropriate tool of measuring service quality in other domains such as information systems, where, as Pitt et al. [17] suggested, it is still appropriate.

From the perspective of antecedents and consequences of satisfaction, Oliver [5] proposed a model that expresses consumer satisfaction as a function of expectation and expectancy disconfirmation. Results have confirmed this concept. Moreover, satisfaction significantly affected customer’s attitude and their intention to purchase. Bearden and Teel [12] also studied the same issue. Data obtained from 375 members of a consumer panel in a two-phase study of consumer experiences with automobile repairs and services were used to examine the antecedents and consequences of consumer satisfaction. The results support previous findings that expectations and disconfirmation are appropriate determinants of satisfaction, and suggest that complaint activity may be included in satisfaction/dissatisfaction research. In order to investigate the moderating effects of customer satisfaction, Carsky [18] examined information, prior beliefs, experience and styling preferences for automobiles on consumer satisfaction and intention to repurchase. Data were obtained from experiment and the results indicated that information would moderate satisfaction, but not intention to repurchase.

3. Research Methodology

From the discussions of literatures above, we find that few researches have described and verified the relationships between customer satisfaction and its antecedents for CSSs. Transactions on the Internet are a new way for CSSs and customers. The methodology on this research consists of two major parts: case and survey method. Case method based on the literatures [19,20,21] begins with a pilot case and is followed by multiple cases. From this method a research model may be derived and some hypotheses proposed. Survey method is designed to verify the model as well as these hypotheses. The procedures will be explained in detail in the sections of research design and data analysis.

3.1. Case method

3.1.1. A pilot case

The researchers, using the theories of electronic commerce and marketing [1,2,4,5,16,17], have listed a pool of items on antecedents of customer satisfaction under online shopping environment. Sample items include “It is very important for security of transaction information between CSSs and customers,” and “CSSs have to provide after service for customers.” We have chosen a well-known CSS (case ‘A’) in Taiwan. This company has operated its business for two years and now has a standard demo store. The items sold include books, computer hardware, software, CDs, etc. From a survey [22] of customers’ preference on the Internet by the Information Industry Institute (III) in Taiwan, the results show these goods to be the major items of customers’ purchases. The researchers interviewed five staff members of this CSS. They include the general manager, marketing staffs and technicians. After discussions with these staffs, some additional items that affected customer satisfaction were identified. The items include “CSSs have to provide lower price than traditional channel for each good,” and “CSSs have to provide variety of goods in transaction.” At the end of interviews, a 12-item instrument was developed using a seven point Likert-type scale ranging from (1) “strongly disagree” to (7) “strongly agree.” These items were to be confirmed again by the staff.

3.1.2. Multiple cases

To make the results more generalizable, the researchers attempted to gather data from other CSSs. Four CSSs (Case ‘B’,‘C’,‘D’, and ‘E’), which operated similar business and sold similar goods with case ‘A’, were selected. 18 subjects were interviewed including vice general managers, deputy managers, marketing staffs, and technicians. Discussions with top
management and staffs produced good agreement that the 12-item instrument is acceptable. This instrument has a reliability (Cronbach’s alpha) of .82 and this score can be appropriate for further research.

4. Research Model and Hypotheses

Based on the results of a pilot case and multiple cases, the antecedents of customer satisfaction for CSSs induced five factors: (1) logistical support, (2) technological characteristics, (3) information characteristics, (4) homepage presentation, and (5) product characteristics. Logistical support contained quick response to customers’ needs, providing communication channels (i.e., e-mail or fax), quickly delivering goods for customers, and providing after service. Technological factors contained modern computer and network facilities and well-structured information systems. Information factors included reliable output information and secure transaction. Homepage presentation contained providing ease to use interface and detail information of goods. Product characteristics included variety of goods and lower prices for goods. Moreover, to measure customer satisfaction, the researchers applied the overall scale attributed to the marketing research [2,4]. This factor included confirmation of customers’ need and degree of satisfaction. From the descriptions above, this paper proposes a research model for customer satisfaction of CSSs (Figure 1).

Figure 1 indicates that logistical support, technological characteristics, information characteristics, homepage presentation, and product characteristics, are each held to influence customer satisfaction. Thus, the research model encompasses 5 hypotheses regarding antecedents of customer satisfaction. The following paragraphs state the induction from the pilot case and multiple cases for each of these hypotheses.

4.1. Logistical Support

Transactions take place electronically. Only when the merchandise is delivered, will the customer then have a chance to physically "touch it". Therefore, the distribution process is critical. So is the after-service.

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**Figure 1. A Research model for the Antecedents and Customer Satisfaction of CSS**
The high quality of both requires a very strong logistical support for CSSs. In all five cases, CSSs still used postal service for distribution. “C” and “D”, however, also offered retail stores as an alternative. In any event, prompt response is critical in the customers’ perception of the CSS. If the CSS can not respond quickly enough, “why bother?” the respondents say.

“A” company has a policy of replacing any defective book returned with a new or good one. “A”, “C”, “D”, and “E” all have one-year warranty for appliances and computer hardware. “D” and “E”, in addition, offer a seven-day money back guarantee for any merchandise they sold. In any event, they all emphasize the quality of after-service, which is facilitated by E-mail. Thus, the first hypothesis is as follows:

H1: The better the logistical support provided by the CSS, the higher the customer satisfaction is perceived.

4.2. Technological Characteristics

Enterprises in the past used stand-alone computers or mail order to serve customers. Limitations on space and time as well as closed systems for computer devices are inevitable. The CSS has none of those because it uses computer systems (e.g., PC or workstation), communication networks, and information systems, which are open to all users all the time. In all our five cases the management put much effort to improve the network architecture by increasing and updating to advanced hardware and software in order to better serving their customers. Thus, Hypothesis 2 is as follows:

H2: The better the technological characteristics are installed by the CSS, the higher the customer satisfaction becomes.

4.3. Information Characteristics

CSS transactions never take place on a face-to-face basis. Therefore, security is naturally a major concern for both businesses and customers. The management in all our five cases has realized this. In the cases of “A”, “B”, and “E”, the management uses postal remittance for payment. In “C” and “D”, they employ retail stores as an alternative if the customers do not wish to finalize the transaction through the CSS. Credit cards in most cases are widely used. Offering inaccurate information is a waste of resources. All the managers of CSSs know that and need to spend much effort on the accuracy and reliability of information. This gives rise to the following hypothesis:

H3: The more reliable information characteristics is offered by the CSS, the higher the customer satisfaction becomes.

4.4. Homepage Presentation

Both the traditional business system and the CSS emphasize the use of good texts, images and animation to communicate with their customers. The CSS can also easily provide customers with more information about the products. However, they need to assure the customers that the information they obtain is of high quality. In all our five cases, the top management recognizes the importance of the interface of communication with customers and wants to provide better design of interface for customers. All five cases make many efforts to coordinate and cooperate with other firms, to provide information along with the physical goods for service to their customers. Thus, the hypothesis is:

H4: The better the homepage presentation is provided by the CSS, the higher the customer satisfaction becomes.

4.5. Product Characteristics

The CSS does not have to possess the products to show them to the customers. What they display are just the images of the products, “virtual products”, and they can sell any of them even though they still possess none of them. Therefore, they can offer more diversified products and lower prices for goods. These virtual products appeal to the customers through their senses of sight and hearing. In every case, CSSs offer more diversification products to the customers. They offer merchandise of all kinds (appliances, hardware, software, and etc.). The more the customers get to select, the better the service they feel that they will have.

Low prices may often be perceived as an indication of low quality. However, our well-informed respondents think otherwise. For the specific products that customers need, CSSs, in every case except “C”, know that the prices that customers pay are lower than those charged at traditional stores. CSSs appreciate that and they appear to realize that lower prices can be one of the major advantages as a result of CSS efficiency. Thus, Hypothesis 5 is as follows:

H5: The more valuable the product characteristics that are provided by the CSS, the higher the customer satisfaction becomes.

5. Research Design

5.1. Sample and procedure

A comprehensive survey was distributed through
mail to each person who had purchased goods from those five CSSs and had agreed to participate in the study. Respondents were voluntary, and people were assured that their individual responses would be treated as confidential. Eighteen items of questionnaires (twelve items for antecedents, two items for evaluation of customer satisfaction, and four items for individual data) were sent to respondents. A total of 89 completed questionnaires (71 were men and 18 were women) from 120 respondents were returned to the researchers. The response rate was 74 percent. The average age is about twenty-five, and Table 1 shows the profile of the respondents.

<table>
<thead>
<tr>
<th>Table 1. Profile of Respondents</th>
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<tbody>
<tr>
<td>Gender:</td>
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<tr>
<td>Age:</td>
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<td>Education:</td>
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</table>

5.2. Operational measures of the study variables

From the research model of Figure 1, the researchers induce five factors as follows:

1. Logistical support: There were four indicators in this study. These indicators included: (1) quick response to customers’ needs, (2) providing communication channel for customers, (3) quick delivery of goods for customers, (4) providing after service.
2. Technological characteristics: Two indicators of technological characteristics were included in this study: (1) the importance of providing modern computer and network facilities, (2) well-structured information systems.
3. Information characteristics: It was measured by two-item scale. This scale included: (1) reliable output information, and (2) the importance of secure transaction.
4. Homepage presentation: Two indicators of homepage presentation were included in this study: (1) ease to use the interface, and (2) detailed information of goods for homepage presentation.
5. Product characteristics: This measure included: (1) variety of goods, and (2) lower prices for goods.

For the evaluation of customer satisfaction, there were two overall indicators: (1) confirmation of customers’ needs, and (2) high degree of satisfaction [2,4,5]. All items used a seven point Likert-type scale ranging from (1) “strongly disagree” to (7) “strongly agree.” Single item questions were used to ascertain respondents’ gender, age, education, and which goods the customers purchased. Gender of respondents was coded (1) for men and (2) for women. Age of respondents was coded by open question. Education consisted of three levels: (1) high school, (2) bachelor’s degree, and (3) graduate degree. The item of purchased goods was coded by open question.

6. Data Analysis

6.1. Factor Analysis

Using the sample of 89 responses, the data were examined using principal component analysis as the extraction method and varimax as a technique of rotation. If we did not specify the number of factors, four factors with eigen values greater than one emerged. However, the factors were interpreted as technological characteristics/homepage presentation, information characteristics, product characteristics, and logistical support. These labels were considered imprecise because one factor appeared to contain two different types of items (e.g., technological characteristics and homepage presentation items). To produce more precise and interpretable factors, the procedure was conducted specifying three, five, and six factors.

It was found that specifying five factors produced the most interpretable results. These factors were interpreted as logistical support, technological characteristics, information characteristics, homepage presentation, and product characteristics. This explained 75.0 percent of the variance. Table 2 depicts the loading of the 12 items on each factor (for factor loading greater than .50). Moreover, the 12-item instrument had a reliability of .82. The reliability (alpha) of each factor was: logistical support=.81; technological characteristics=.67; information characteristics=.72; homepage presentation=.64; and product characteristics=.55.
Table 2. Rotated Factor Matrix of 12-item Instrument

<table>
<thead>
<tr>
<th>Item code</th>
<th>Logistical Support</th>
<th>Technological Characteristics</th>
<th>Information Characteristics</th>
<th>Homepage Presentation</th>
<th>Product Characteristics</th>
</tr>
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<tbody>
<tr>
<td>L1</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>L2</td>
<td>.78140</td>
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<td>L3</td>
<td>.75720</td>
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<tr>
<td>L4</td>
<td>.72466</td>
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<td></td>
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<td>T1</td>
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<td></td>
<td></td>
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6.2 Analysis of Correlation

To explore the five hypotheses above, the analysis used a seven point Likert-type scale for measuring the relationships between the five factors and customer satisfaction. The respondents were asked about confirmation of customers’ need and degree of satisfaction. This instrument had a reliability (Cronbach alpha) of .86. The results, depicted in Table 3, support all hypotheses. These factors and customer satisfaction were significantly correlated. Especially, logistical support has the strongest effects on the consequence of customer satisfaction. All transactions on the CSS are electronic and virtual. Only customers when receive physical goods (i.e. scanner) quickly and securely, can they really perceive the services provided by CSSs.

Table 3. Correlation between Five Antecedents and Customer Satisfaction

<table>
<thead>
<tr>
<th>Customer Satisfaction</th>
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</thead>
<tbody>
<tr>
<td>Logistical Support</td>
<td>.29**</td>
</tr>
<tr>
<td>Technological Characteristics</td>
<td>.22’</td>
</tr>
<tr>
<td>Information Characteristics</td>
<td>.25’</td>
</tr>
<tr>
<td>Homepage Presentation</td>
<td>.22’</td>
</tr>
<tr>
<td>Product Characteristics</td>
<td>.23’</td>
</tr>
</tbody>
</table>

* Significant at p = .05
** Significant at p = .01

From Table 3, we find the logistical support seems to be the most important antecedent of the customer satisfaction for online shopping. It may be also a very important antecedent for traditional marketing, but it appears to be more so for electronic commerce. Technological, information, and product characteristics are just as important antecedents of customer satisfaction for CSSs and traditional channels as well. However, homepage presentation is a new and unique antecedent for electronic shopping. To a large extent it
replaces the personal contact of sales people and the catalogues in the traditional marketing.

7. Conclusion

Electronic commerce through CSS transactions is growing rapidly. Based on the experience of Internet growth in the recent years, the researchers expect to see a CSS explosion in the near future. Soon it will become a part of our life. Businesses and researchers as well can no longer afford to ignore it. The present research is one of a very few attempts to deal with the subject.

The discussion of customer satisfaction in the literature is based toward traditional channels, and there has been little research to explore and examine customer satisfaction and its antecedents for CSS on the Internet. This paper contributes to this area by building a research model of customer satisfaction for CSS and proposing five validated hypotheses. Moreover, a survey method was used to examine these hypotheses and found that the antecedents (i.e., logistical support, technological characteristics, information characteristics, homepage presentation, and product characteristics) and customer satisfaction are significantly correlated. We discover that homepage presentation as an antecedent of customer satisfaction is new and important for online shopping on the Internet. The other four antecedents are applicable for traditional marketing. However, logistical support appears to be the most significant antecedent for electronic commerce.

Since electronic commerce in Taiwan has operated for only about three to four years, it is still on the growing stage of product life cycle. It is difficult to conduct a sizeable scale of survey. Future researches may be conducted in two areas. First, the researchers need to include all lines of businesses (i.e., financial consultation, travel agent etc.) for generalizing of the research model on customer satisfaction. Second, samples of this study should be conducted on a larger scale and with a greater variety.

8. References