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# CUSTOMER ONLINE EVALUATION IN THE AGENT-BASED E-COMMERCE SYSTEM: CONTENT ANALYSIS

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## Abstract

*This paper was to study customer online evaluations on the agent-based E-commerce Web site. Content analysis was used to exam online text comments made by customers on a software agent Web site which links to multiple Internet stores. Through the investigation, key determinants affecting customer satisfaction were identified. The correlation between each factor and each customer's overall star satisfaction rating was measured. The study revealed that there were more positive reviews than negative reviews in 106 customer online evaluations. The primary determinant in positive reviews was to receive the merchandise as ordered on time. The primary determinant in negative reviews was customer support services. Eight out of nine identified factors, were significantly correlated to customers' overall star ratings. Some implications as well as future research directions were provided.*

**Keyword:** E-commerce design, Software agent, Internet shopping, Customer behavior, Software use

## Introduction

A common belief is that the Internet technology will provide customers access to more information about various products and vendors. However, the amount of information available on the Internet is enormous. Consequently, it may be difficult for customers to find relevant information (Pedersen, 2001). The recent, rapid development of agent-based E-commerce web sites has offered the online customer a great shopping environment. These agent web sites provide online customers a great variety of products with comparative prices on a product from each of the Internet stores. More important, the agent-based E-commerce Web site is able to offer a very efficient way to collect and publish consumers' feedback. The comments from an Internet store's previous customers could be a valuable asset to other oncoming customers. The purpose is to establish the trust between online customers and those newly emerged online stores, to make their choice and let them feel comfortable to conduct online-shopping. Customers' lack of inherent trust in "strangers" on the Web is logical and to be expected. If any company wants to do business, it had to prove its trustworthiness by satisfying customers for many years as it grew. Businesses on the Web site must find ways to overcome this well-founded tradition of the distrusting strangers (Schneider, 2001). Not only do the oncoming online customers care about the price of the product, but also more importantly they want to do business with an online store they trust so that they will receive the product as ordered on time.

Bringing customers back is a key to success for online businesses. A very low rate of revisiting customers actually contributed to many dotcom failures. A tremendous amount of research has been devoted to finding out how to attract customers to an E-commerce web site, e.g. banner advertisements, referral programs, etc. A one-time customer is proved to be too costly for a merchant to attract. It is just about time to see how to make online customers keep coming back. This paper can certainly help find out what satisfied online customers value.

The purpose of this paper was to study customer online post-shopping text comments and overall online evaluations on an agent Web site with multiple Internet stores. The study analyzes and categorizes these comments, identifies key determinants of customer Internet store post-shopping evaluation, and investigates how these key determinants affect their overall evaluation. The result of the research will help an individual online store to understand customer's purchase behavior and to improve service quality and customer retention. Further more, it will provide valuable suggestions for the design and implementation of online evaluation on agent-oriented E-commerce Web environment. The identified key determinants will be especially helpful to the design of online evaluation questionnaires.

The following research questions were asked in this study:

1. Are most online customers satisfied with shopping on the software agent web site?
2. What are the key determinants that affect Internet store post-shopping evaluation?
3. What are the primary determinants of positive online customer evaluation?
4. What are the primary determinants of negative online customer evaluation?
5. How are these determinants correlated to overall Internet store post-shopping evaluation?

## Conceptual Background

Software agent is not a new concept, but it has not grown until the past decade when the Internet technology created a perfect environment for E-commerce, with its roots in problem solving and knowledge representation (Wang, 2001). From user's point of view, an agent at least reduces complexity and increases efficiency, and the delegation of functions supports user mobility (Liu, 2001). An agent is also seen as its user's personal digital assistant, which provides personalized assistance in a specialized task (Maes, 1994). The request sends from your personal Web agent out on the Internet to search for the best price. Such an agent, aimed with all the critical specifications you supply, would first locate e-commerce sites that sell what you want. Then the agent would collect information about the price and characteristics of the equipment that the site sells from comparable selling agents that work on behalf of the commerce site (Schneider, 2001).

Researchers in the marketing have studied consumer buying patterns and trends for years. Post-purchase behavior is generally recognized as one of the important factors in consumer buying decisions process. During the purchase phase, the consumer will ask, "will I like this", or "is this a good deal". After the purchase, these questions become "do I like this" or "did I get a good deal". During the post purchase phase, consumer experience some level of satisfaction or dissatisfaction (Spreng, etc. 1996). According to La Barbera and Mazursky (1983), satisfaction is a function of the extent to which the customer's perception of the product's performance meets her expectation. When product performance meets her expectation, she will be satisfied with the purchase and more likely to purchase the product again. It is very important to satisfy consumer by enhancing store's relationship with them. A satisfied customer will tell three people about their experience, but a dissatisfied customer will complain to thirty people. The level of perceived satisfaction and dissatisfaction is presumed to have influence on the consumer's attitude, intention and complaint behavior (Bearden and Teel, 1983). Taylor (1974) also indicated that consumers tend to regard information obtained by "word of mouth" as more objective and possibly more accurate. Therefore, consumer comments can be a powerful influence on the purchase decision of others (McGaughey and Mason, 1998).

Like traditional stores, online stores also need to build strong relationship with their customers. With the use of Internet technology, software agent web sites actually have more advantages and potential than traditional stores. To help customers establish trust to an Internet store, the agent web site displays multiple customer online post-shopping evaluations on each linked Internet store. The agent web site provides customers an opportunity to choose the Internet store they think they will trust and feel comfortable with to conduct their online shopping.

## Methodology

To analyze online customer evaluation and identify key determinants of overall rating, content analysis was used in this study. According to (Krippendorff, 1980), the term content analysis is about 70 years old. Researchers have used this approach to the analysis of documents and texts that seeks to quantify content in terms of predetermined categories and in a systematic and replicable manner. To categorize customers' comments, it is suggested to use previous created categories as often as possible if they fit the framework of the study (Easwar, 1993). However, since this approach to analyzing customers' online comments has not been done before, new categories for this purpose were developed.

### ***Instrument Development***

A pretest was conducted prior to this study to develop key determinants (categories) for content analysis. This was completed using data from five online stores in a popular agent Web site. This agent Web site provides customers with comparative prices for a product from multiple online stores. It invites customers to write an evaluation for each online store that they have purchase experience with. Each customer evaluation has two parts: comments and overall evaluation rating. The comments are in text format with a limitation of 500 characters. Overall comments are displayed by giving the number of stars. The number of stars is on a scale of 1 to 5, with 1 star being the worst and 5 stars being the best.

The unit of analysis is word and theme. The word is the smallest element or unit used in content analysis. Its use generally results in a frequency distribution of specified words or terms. The theme is a more useful unit to count. In its simplest form, a theme is a simple sentence. The theme is used as unit of analysis if the specified word is not found. The combination of both word and theme is used as a content unit. A checklist was created from the analysis of the five online stores' customer comments during the pretest. The checklist consists of 9 distinctive items. Online shoppers have mentioned at least one of these 9 items in their online comments. There are listed as follows:

1. General feeling on the web site design
2. Competitive price of the product
3. Merchandise availability
4. Merchandise condition
5. On-time delivery
6. Merchandise return policy
7. Customer service availability
8. E-mail confirmation on customer order
9. Promotion activities

### ***Data Collection***

From the same software agent Web site, a sample pool of 419 online stores was identified. Each of them has various numbers of comments ranging up to 364. Stores with less than 30 customer comments were eliminated from the study. The final data set consists of 106 customer comments from 53 Internet-based stores.

### ***Data Analysis***

The data analysis in each review was based on the data recorded on the checklist. The results of data analysis were reported separately and in tabulated forms. Table 1 presents a frequency distribution of 106 overall star ratings classified by customers' post-shopping satisfaction level. This exhibit lists the frequency of occurrence of each classification of wage rate. The total number of reviews given was 106. The percent of the total has been computed by dividing the number in each level by the total number of overall star ratings.

Table 2 shows the correlation between each of the nine factors and overrating in all customer reviews. The nonparametric Spearman correlation was used to test the association between the overall rating of satisfaction and the nine determinants. Figure 1 shows a frequency of distribution of the number of times each factors has occurred in sixty-two positive reviews and in forty-four negative reviews. Relative frequency is computed as the number of occurrences of each factor divided by 62 positive reviews and that divided by in forty-four negative reviews.

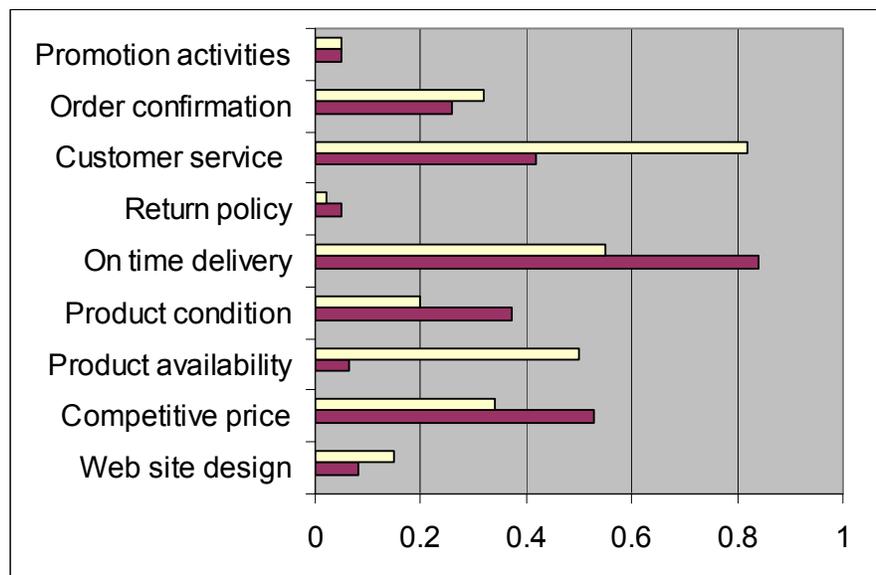
**Table 1. Overall Rating Classified by Satisfaction Level**

| Level of Satisfaction (Overall Rating) | Number of Overall Rates at Satisfaction Level | Percent of Total |
|--|---|------------------|
| Very satisfied                         | 53  | 50.0             |
| Somewhat satisfied                     | 9   | 8.5              |
| Neutral                                | 0   | 0.0              |
| Somewhat dissatisfied                  | 3   | 2.8              |
| Very dissatisfied                      | 41  | 38.7             |
| Total Reviews                          | 106   | 100.0            |

**Table 2. Correlation Between Each Factor and Overall Satisfaction Rating**

| Identified Determinants  | Occurrences in Total Reviews | Percent of Total N - 106 | Correlation Coefficient |
|--------------------------|------------------------------|--------------------------|-------------------------|
| Web site design          | 12                           | .11                      | .657*                   |
| Competitive price        | 49                           | .46                      | .887**                  |
| Merchandise availability | 26                           | .26                      | .737**                  |
| Merchandise condition    | 32                           | .30                      | .798**                  |
| On-time delivery         | 76                           | .71                      | .881**                  |
| Return policy            | 4                            | .04                      | 1.00**                  |
| Alive Customer service   | 62                           | .59                      | .895**                  |
| Order confirmation       | 30                           | .28                      | .538**                  |
| Promotion activities     | 5                            | .05                      | .612                    |

\* $p < .05$     \*\* $p < .01$



Relative Frequency of Occurrences of Factors  
 Occurrence of factors in negative reviews  
 Occurrence of factors in positive reviews

**Figure 1. Occurrences of Factors in Both Positive and Negative Reviews**

## **Conclusion**

1. There were more positive than negative overall ratings indicating most customers were satisfied with the Internet stores listed on the agent Web site. 58.5% of the total reviews were either very satisfied or somewhat satisfied. 41.5% of the total were either very dissatisfied or somewhat dissatisfied. There was no presentation of neutral evaluation. The customers who remained neutral might not be motivated to rate the online store.
2. Nine factors were identified in the customer text comments. There was a difference between the primary determinants of positive reviews and that of negative reviews. Figure 1 visually illustrates the comparison of the frequency occurrences of each of the factors in both positive reviews and negative reviews. The satisfied customers showed their primary concern was to receive products as ordered on time with a competitive price without any hidden charge, then customer support. Whereas the primary concern of unsatisfied customers was customer service via phone or e-mail, availability of merchandise in stock and delivery of merchandise as ordered on time. This reflects that most dissatisfied customers might be irritated by either unfriendly or insufficient customer services. They did not receive the merchandise as ordered on time since the delay might be caused by unavailability of the merchandise.
3. The nonparametric Spearman coefficients indicate the correlation between each determinant to overall satisfaction rating. Except promotional activities, all of the eight determinants are significantly ( $p < 0.05$ ) related to satisfaction rating. The results of correlation analysis also indicated on-time delivery (Spearman correlation = .273,  $p < 0.01$ ) and customer service (Spearman correlation = .663,  $p < 0.01$ ) are significantly correlated to overall satisfaction. The primary determinant in negative reviews was customer service, which was presented in 36 out of 44 reviews. However, correlation analysis results indicated that only price competitive (Spearman correlation = .683,  $p < 0.01$ ) is significant related to overall satisfaction ratings.

## **Implications**

Research reveals that software agents will become extremely important in the electronic commerce field. Online Internet store online evaluation is so young that it has been much used on many agent-based E-commerce sites yet. It is one of the strategies to build the trust between online customers and “stranger” Internet store. It does have great potential to bring more customers to Internet stores. The result of this study will have impacts on improvement of the customer service quality of Internet Stores as well as the design of new questionnaires for agent-based E-commerce Web sites.

### ***Improvement of the Customer Service Quality of Internet Stores***

1. Well-trained live customer service people are vital to the existence of Internet-based store. They are there to solve the problem of miscommunication between the web site and online shopper.
2. It is important for an Internet-based store to keep its promised competitive price on the web site to its customers. In the negative reviews customers pointed out the customer service of some Internet stores don't recognize their prices on their web site, or try to sell accessories with extra prices, or charge extra for insurance, service or shipping fees. This really turns away customers.
3. The availability of merchandise should be displayed on the store's web site. Many complaints from the customers indicated that their orders were not received after the charge had been placed on their credit card account for a long time. The cause of the delay might be because of poor inventory management by the store.

### ***Impact on Design of Agent-Based E-Commerce Web Sites***

The research results are also valuable for the design of new questionnaires for agent-based E-commerce Web sites. The eight significant determinants can be used in the online evaluation questionnaire to measure online customer post-shopping satisfaction. The questionnaire survey will save customers time and will possibly generate more comprehensive customer feedbacks through it may take more storage space than text comments.

## Limitations, Assumptions and Recommendations

The concentration of this study was to evaluate customer online comments on internet-based stores accessed by agent-based E-commerce Web sites, but not online stores of traditional department stores and discount stores. The posted reviews represented those Internet-based store shoppers who had intention to show and share their opinion on the Internet store they have used. Further research needs to be done on the portion of customers who did not choose to express or share their post-shopping satisfaction.

Certain assumptions were basic to the investigation of the post-shopping customer comments. Of primary importance was supposition that the post-shopping customer comments serve as a basic reference for other online customers.

Another assumption is that what was presented in the online comments does not always indicate what was presented from another customer's feedback for the same online store even if the online comments were from the customer's own experience. This was because in the real world there was the possibility that each customer did his/her own individual shopping for certain items during certain period of time in certain setting. Therefore, it was assumed that the results of the study were related to a certain customer post-shopping comments.

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