

Merged Structural Equation Model of Online Retailer's Customer Preference and Stickiness

Sri Hastuti Kurniawan

Wayne State University, 226 Knapp Building, 87 E. Ferry, Detroit, MI 48202, USA
af7804@wayne.edu

Abstract: Rapid explosion of the number of online retailers as well as online customers has been observed in these past few years. Comparable growth in sellers and buyers means that Internet retailers have to understand how to make customers prefer them to the competitors and make the customers loyal to their stores. Previous structural equation modeling study of customer preference and stickiness in online retail business revealed that some of the aspects that contributed to customer stickiness and customer preference were community involvement, convenience, site's appeal, entertainment aspect of online shopping and customer satisfaction and that these five factors contributed to customer preference and customer stickiness in similar fashion. The objective of this study was to investigate whether the two models could be merged. The analysis revealed that a merged model with customer stickiness as the indigenous construct could parsimoniously reproduce the pattern of covariation in the measurement model.

Introduction

As is the trend of Internet-fueled industries, these past few years have seen a rapid explosion of the online retail business, which includes an explosion in the sheer number of available products as well as the number of online stores. Internet retail sales are predicted to top \$36 billion in 1999 in the US alone, a 145 percent jump from 1998 (Responsive Database Services 1999). Comparable growth in Internet buyers and Internet sellers can only mean that the Internet stores will face stiff competition to attract new customers to visit, to make customers prefer their sites over the competitors' sites and to maintain customer loyalty.

Finding ways to make a customer choose its store over its competitors is definitely one of the business targets of any Internet store. However, in the long run, efforts to make the customers stick to the store also play a role in the success of online stores. One of the ways to attract customers is through an intricately designed Web site (Violino 1999). However, online sales follow the philosophy of its traditional forms of sales: "customer is the king". With various options available in the Internet and the ease of switching from one e-retailer to another, without customer-oriented philosophy, it is difficult for an Internet retailer to make its customers to keep coming back to their shops and purchasing their products. As Federal Express Corp. CIO Chris Hjelm said, "In the Internet and e-commerce driven world, the customer is given the increased power of choice. Global competitors appear every day, and companies that provide the best customer service reach and keep customers at the expense of their competition." (Sweat 1999).

Review of Literature and Development of Hypotheses

What aspects of customer behavior determine why a customer would stick to a particular Internet retailer site? While most previous studies have viewed the solution from the company's side such as faster server, improved security, more user-friendly interface, etc, some studies and researches observing customer's perception and opinions on this topic have been performed by various companies and institutions.

A complete and positive customer experience is thought to be the key factor to customer retention and loyalty (Pelton 1999). It was also suggested that customer experience shouldn't be viewed solely through the lens of information technology, but also through entertainment and community. The author described community as a sort of affiliation, that if we purchase one particular product, we are proudly a part of this 'elite' community of owners (e.g. Harley Davidson, Saturn, Mazda Miata, etc). The author described facilitating entertainment as making browsing process become a form of entertainment in itself for customers, comparable to window shopping in real life. More strongly, it was suggested that an e-retailer site that fails to carefully compose

customer experience will not effectively capture his/her interest, prolong visits or lead to purchases. This creates missed opportunities to increase customer contention and loyalty, and generate revenue (Eisen 1999).

One way to increase customer loyalty is to add features that let buyers personalize the site, automate product selection and comparison, and communicate instantly with a sales or service representative. E-commerce sites are also competing by developing community-building features, such as members-only sites that let people with similar interests communicate with each other (Blundon & Bonde 1998). A mechanism in traditional marketing used to assess and boost customer retention called “stickiness” in the e-commerce context was discussed by (Nemzow 1999). The author suggested that stickiness could be created through various ways ranging from brand awareness, frequent buyer program, to creating financial hurdle that discourages customers from switching to competitors.

To summarize, several aspects might affect customer stickiness of a particular online store, such as site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction, the entertainment the site provided and customer preference.

Previous data-driven analysis of structural equation modeling (Kurniawan 2000) revealed that site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction and the entertainment the site provided explained customer preference and customer stickiness in similar fashion. The objective of this study is to investigate whether these two models could be merged and if customer preference does contributes to customer stickiness as suggested by the literature.

Objectives and Summary of Hypotheses

The objective of this study is to test a model of customer stickiness in online retail business. To accomplish this objective a specific question was addressed:

What is the predictive relationship between customer stickiness and these six aspects: site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction, the entertainment aspect of the site, and customer preference?

Based on the result of the previous study (Kurniawan 2000) where site’s appeal, community involvement, convenience, customer satisfaction and entertainment explained customer preference and customer stickiness in similar fashion, it is hypothesized that the two mediated structural equation models revealed in previous study could be merged. The hypotheses are formulated as follow:

H1: The site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction, the entertainment aspect of the site, and customer preference are positively related to customer stickiness.

H2: Customer preference will mediate the relationship between customer stickiness and the site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction, the entertainment aspect of the site.

Methodology

Subjects and Data Source

The Graphic, Visualization, and Usability Center (GVU) at the Georgia Institute of Technology hosted in their Web site a series of questionnaires related to different aspects of computer use. One section of the questionnaire, called “Purchasing on the Internet” questionnaire fielded on October 10, 1998 through December 15, 1998 contained questions related to the different aspects that might affect customer attitude toward purchasing on the Internet. Five hundred randomly selected adult respondents (age 18 years and above) who purchased products or services through the Internet for personal use in the past three months before filling in the questionnaire and stated their annual incomes from 889 complete cases (100% non-missing data) were analyzed. The respondents ranged in age from around 18 to around 83 years (the age groups were re-coded using their medians), with an average age of 38 years (S.D. = 12.1 years). The sample was predominantly male (69%). The respondents have quite high education levels with only 10% have less than some college. The respondents also have quite high income (the income groups were also re-coded using their medians) with the average annual income of \$63K (S.D. = \$30K).

Measures

The instrument of the following measures is a 7-point discrete scale. The respondents were given a statement that they respond to by choosing from “Strongly disagree” to “Strongly Agree” about the customer’s experience with the Internet retailer they recently purchased from except for the Community Involvement construct where the respondents were given a statement that they respond to by choosing from “Extremely uncharacteristic of me” to “Extremely characteristic of me” relating to their attitude about interacting with the Internet retailer they recently purchased from as well as its customers.. The list of questions and their related constructs could be found in previous study (Kurniawan 2000). The summary of constructs is listed in (Tab. 1).

<i>Construct</i>	<i># items</i>	<i>Reliability (α)</i>	<i>Factor loadings</i>
Customer stickiness	8	0.863	0.49*** - 0.77***
Customer preference	12	0.942	0.63*** - 0.87***
Customer satisfaction	12	0.936	0.65*** - 0.85***
Entertainment	10	0.917	0.56*** - 0.87***
Community Involvement	9	0.872	0.52*** - 0.82***
Convenience	5	0.870	0.66*** - 0.86***
Site's appeal	5	0.884	0.63*** - 0.76***

Table 1: Summary of constructs, *** = $p < 0.001$

Analysis and Results

The purpose of this study was to test the possibility to merge two structural equation models of customer preference and customer stickiness. It was hypothesized that customer preference will mediate the relationship between customer stickiness and the site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer’s satisfaction, and the entertainment aspect of the site. Analysis focused on:

- (1) Examining the correlational relationships between the items and their underlying construct and correlational relationships among constructs.
- (2) Observing whether the site’s appeal, the community atmosphere the site created, the convenience the online store offered, customer satisfaction, the entertainment aspect of the site and customer preference explained customer stickiness.

Correlational Relationships

	customer satisfaction	entertainment	community involvement	site's appeal	convenience	customer preference	customer stickiness
customer satisfaction	1						
entertainment	0.14**	1					
community involvement	0.13*	0.34***	1				
site's appeal	0.50***	0.49***	0.28***	1			
convenience	0.78***	0.11*	0.05	0.43***	1		
customer preference	0.84***	0.21***	0.15**	0.5***	0.73***	1	
customer stickiness	0.28***	0.58***	0.23***	0.34***	0.17**	0.41***	1

Table 2: The correlations among constructs, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

Table values under the column *Factor loadings* in (Tab. 1) showed the correlations between the items with their respective underlying constructs. These values were obtained using Confirmatory Factor Analysis using Lisrel VIII software package (Jöreskog & Sörbom 1993). Moderate to high factor loadings (ranging between 0.49 to 0.87, $p < 0.001$) were observed in all items.

Table 2 contains the correlations among constructs. The constructs represent 53.8% of the total variance accounted for by the 61 variables that grouped into seven constructs which constitute the model. The range of the correlation coefficients is quite large, varying from 0.05 to 0.78. All of the correlations are significant at $p = 0.05$ except for the correlations between 'convenience' and 'community involvement'. The correlation among variables was also provided by Lisrel VIII software but was not included in this paper because of their values were not directly relevant to the investigated model.

Latent Relationships

In order to determine the causal relationship between entertainment, customer satisfaction, community atmosphere, convenience, the site's appeal, customer stickiness and customer preference, structural equation modeling was employed (Jöreskog & Sörbom 1993). Structural equation modeling allows one to create latent constructs comprised of several observed variables intended to assess a particular construct. The advantage here is that the relationship between these latent constructs is disattenuated for measurement error. This technique also allows the predictive relationship between all latent constructs to be examined simultaneously. All structural models were estimated using the LISREL VIII program (Jöreskog & Sörbom 1993). Models with Chi-square (χ^2) estimates less than two times the degrees of freedom (Akaike 1987), residual error less than .05 and overall fit indices above .90 were considered adequate fitting models.

Analysis began with the specification of a measurement model where the constructs are correlated to one another. The specified measurement model included some correlated measurement errors of variables that represent the same constructs. This measurement model had an adequate fit: $\chi^2(2288) = 4544.60$, residual error < 0.05 , most fit indices $> .90$. Next, a series of structural equation models was performed in order to determine the pattern of relationship between the latent constructs that would most parsimoniously reproduce the pattern of covariation in the measurement model.

The first structural model was the hypothesized model depicted in (Fig. 1). Although the fit of this model is adequate: $\chi^2(2303) = 4580.21$, it was significantly different from the initial measurement model: $\chi^2(\text{diff}(15)) = 35.61$. Therefore, more iteration is needed.

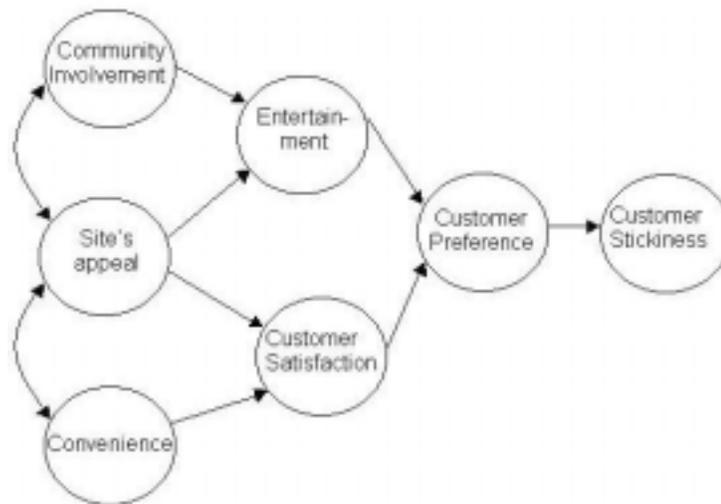


Figure 1: Hypothesized model of customer stickiness

Based on beta's modification indices, there is a significant relationship between entertainment and customer stickiness. Adding predictive relationship between these two constructs yields a new $\chi^2(2302) = 4570.89$ and a χ^2 difference with the measurement model: $\chi^2(\text{diff}(14)) = 26.29$. The last model has adequate fit, is not significantly different from the initial measurement model, and has no more significant beta modification indices. Therefore, this model is considered as the final model. The model is depicted in (Fig. 2).

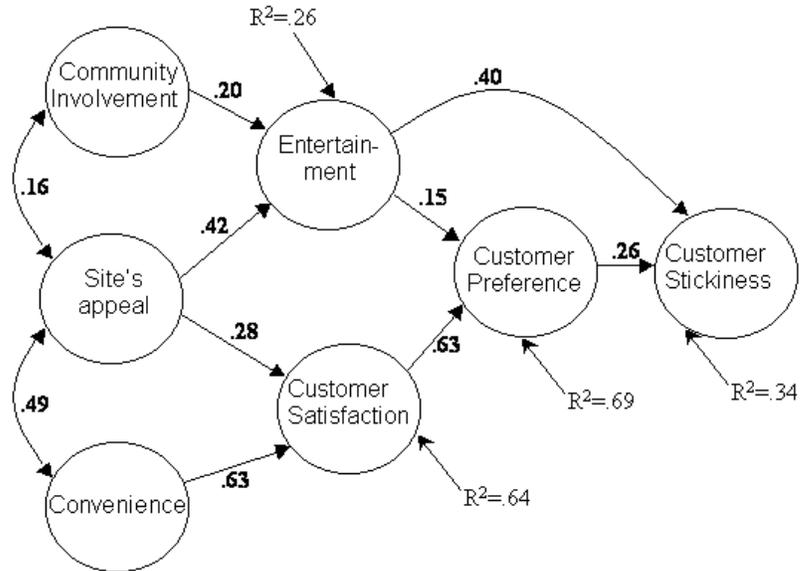


Figure 2: The final model of customer stickiness

Discussion

The current study attempted to examine a structural equation model of customer stickiness in e-retail business by examining the possibility to merge two previously tested structural equation models of customer preference and customer stickiness (Kurniawan 2000). The Confirmatory Factor Analysis of the observed variables produced factor loading values listed in (Tab. 1) showed that the variables load on relevant factors with medium to high loadings, indicating that those variables well represent the intended underlying constructs.

The pattern of correlational relationships as shown in (Tab. 2) is congruent with the literature and supports the first hypothesis (H1). That is, the site's appeal, the community atmosphere the site created, the convenience of shopping online, customer satisfaction, the entertainment aspect of the site and customer preference correlate positively with customer stickiness. It led to the conclusion that if the e-retailers facilitate these factors, customer stickiness would in turn be facilitated.

The final model showed that only customer satisfaction and entertainment predict customer preference in direct way. The effect of community involvement and site's appeal on customer preference and stickiness was mediated by entertainment while the effect of site's appeal and convenience was mediated by customer satisfaction (see Fig. 2). The implication of the results is intriguing. It suggests that although the customers recognized that shopping on the Web is convenient which brings satisfaction to them, some customers might not feel it entertaining. In similar fashion, the feeling of being part of the community affiliation of a certain Internet retail site might be entertaining to the customers, but it doesn't necessarily lead into customer satisfaction. As an illustration, being part of Apple® community because of owning one might be fun, but does not necessarily bring about satisfaction. The fact that the effect of site's appeal and convenience on customer preference is fully mediated by customer satisfaction means that although by looking at the bivariate correlation it seemed that site's appeal and convenience predicted customer preference, their effects are only indirect effects.

The variation of customer satisfaction was better explained by its predictors than those of the entertainment, showed by a much larger squared multiple correlation coefficients (R^2).

The other noticeable result was that site's appeal was correlated with both the community affiliation involvement and convenience. The fact suggested that by designing an appealing Web site, the customers would feel that their shopping experience on the Web is a convenient experience. A proper design of Web site would also boost the feelings of being part of the elite community of this particular product's users.

Turning to the second hypothesis of the study, the structural equation model does not fully support the hypothesis. Customer preference fully mediates the relationship between customer stickiness and the four constructs: the site's appeal, the community atmosphere the site created, the convenience of shopping online and customer satisfaction. However, there is direct relationship between customer stickiness and entertainment. The

result implied that customer stickiness could be facilitated by ensuring that the four constructs facilitate customer preference. However, it is not enough to ensure that entertainment facilitates customer preference to guarantee customer stickiness. Entertainment aspect of online shopping by itself is predictive of customer stickiness.

Conclusion, Limitations and Further Direction

The main aim of the study is to investigate the underlying constructs of customer's experience and find out the model of correlational relationships among different constructs of customer's experience. The outcome of the model is customer stickiness, as suggested by various literatures to be the outcomes desired by e-retailers. Two hypotheses were developed based on literature reviews. The study found that the first hypothesis was supported and the second one partly supported. The final model is depicted in (Fig. 2).

Due to the cross-sectional nature of this study, statements regarding causality among the hypothesized factors can not be made. Instead, the identified pattern of predictive relationships should be considered as a first step in determining the relationship between customer stickiness and various possible underlying constructs, as well as the interrelationships that exist among underlying constructs. The limitations of using a convenience sample should also be acknowledged. This data was analyzed with the data from GVU data that contain more long-term, sophisticated computer users than the general population (Hoffman, Kalsbeek & Novak 1996).

With the e-commerce, e-business and e-retail increasing at almost unimaginable speed, exploring the psychology of Web use in the area of e-retail would be the first step towards understanding what work and what doesn't in order to make the customer stick to a particular e-retailer. The growing complexity of e-commerce technologies coupled with rapidly rising customer sophistication, makes focusing on user even more important. The next step would be to create a way to make certain that this knowledge could be realized and applied to the design of the Web site as well as the process of e-retailing. Further studies in the area of Web design usability and retail process evaluation from user's perspective would be fruitful for both the customers and the e-retailers.

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