Study on Enhancing E-satisfaction through Web Functionalities across the Customer Service Life Cycle in E-commerce Environment

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Abstract: This paper examines how combinations of Web functionalities impact the relative importance of the stages of the Customer Service Life Cycle (CSLC) in determining customer satisfaction. Results of regressions indicate that customers consider Web functionality support for the pre-purchase stages of the CSLC to be most important, with the requirements stage or acquisition stage consistently being first in importance. By considering the products sold online, organizations can invest their resources to build Web functionalities that incorporate values, culture, and processes to increase customer satisfaction with the Web site and influence firm performance.

Key words: Customer Service Life Cycle(CSLC); Web functionalities; E-satisfaction; E-commerce

1. Introduction

E-commerce conducted online through Web sites has over the past few years shown dramatic growth. However, questions arise as to whether customers are satisfied with specific sites or whether they jump from site to site for each purchase. Research (Saeed, Grover&Hwang, 2005) calls for more understanding of the importance of various Web features in creating customer satisfaction. Customer satisfaction with Web sites is important in gaining competitive advantage (Zhang & von Dran, 2001,2002).

Saeed, Hwang and Grover (2002,2003) defined Web functionality as specific Web features aimed at providing a compelling shopping experience and adding customer value with the goal of increasing firm performance. Mithas (2006, 2007) defined Web functionality as the usefulness of services provided, the convenience of services, and the extent to which a Web site enables customers to accomplish goals. Firms can use Web site functionality to address the various stages of the relationship with the customer, as defined by the Customer Service Life Cycle (CSLC). The four stages of CSLC include requirements, acquisition, ownership, and retirement. By meeting needs of the customer throughout the firm-customer relationship by integrating firm resources with Web functionality, firms can gain competitive advantage over competitors and leading to a sustained competitive advantage.

The objective of this research is to weigh various functionalities within each stage of CSLC to determine the importance of the functionalities, and importance of CSLC stages in predicting customer satisfaction. The results will guide firms in integrating their resources to optimize the use of Web site functionalities relative to the stages of CSLC.

2. Customer Service Life Cycle (CSLC)

The customer resource life cycle (CSLC) was presented as a framework for identifying internet service applications (Ives & Learmonth, 1990). This model focuses on a single relationship: supplier and customer. The original model consisted of four broad stages (requirements, acquisition, stewardship, and retirement) and illustrated the investment of time and effort by the customer. Ives and Learmonth (1990) stated that internet service can support these stages and offer differentiation via enhanced customer service or direct cost savings. Ives and Mason (1995) referred to this model as the Customer Service Life Cycle (CSLC) with the four stages of requirements, acquisition, ownership, and retirement.

The requirements stage of CSLC refers to the period during which the customer decides which product and/or service to order. Attributes like quantity, features, and/or price are considered. Acquisition is the stage that involves the actual ordering, paying for, and acquiring of the product and/or service. It also includes order tracking. Ownership is the third stage of CSLC. During this stage, the customer uses the product or the results of the service; monitors usage; and/or requires maintenance, upgrades, or training. The final stage of retirement involves the disposal, cancellation, return, trade, or selling of the product or service. In the online environment, each stage of CSLC involves interaction between the customer and the Web site and offers an opportunity for the firm to add value to the customer's online shopping experience.

3. Customer Service Life Cycle (CSLC) and Web Functionality

Saeed (2002, 2003) identified Web site features for each stage of CSLC. He identified 19 functionalities for the requirements stage, 13 for acquisition, and 12 for ownership; since the retirement stage was too young, no functionalities were associated with this stage until later research by Saeed (2005) identified ten functionalities and examined how the presence of Web functionality for each stage of CSLC

affected wealth creation.

The results show that the presence of functionalities for the requirements stage affected short term performance of a firm. This stage benefits from the experience and time devoted to its refinement. However, the presence of functionalities for the requirements stage did not affect long-term firm performance. The presence of functionalities for the acquisition stage had no effect on short or long-term firm performance. The presence of functionality for the ownership stage showed a positiverelationship with long-term firm performance suggesting that after-sales service is relate to long-term relationship with customers. The relationship between this stage and short-term performance, however, was not significant. There also was no relationship between the presence of functionality for the retirement stage and the performance of the firm. Firms that recognize that customer needs vary with each stage of the CSLC can optimize the support for each stage and integrate business processes and firm values. Saeed (2005) study shows that Web site functionality can be a factor in determining short- and long-term performance.

TABLE 1: SHORT-AND LONG-TERM EFFECT OF WEB FUNCTIONALITY BY CSLC STAGE

Presence of Web Functionality	Short-term Performance	Long-term Performance
Requirements Stage	Yes	No
Acquisition Stage	No	No
Ownership Stage	No	Yes
Retirement Stage	No	No

4. e-Satisfaction in THE E-COMMERCE environment

Customer satisfaction in the online environment (known as E-satisfaction) is a non-personal interaction driven by site characteristics and service features (Bansal, McDougall, 2004). Anderson and Srinivason (2003) define E-satisfaction as the "contentment of the customer with respect to his or her prior purchasing experience with a given electronic commerce firm". Szymanski and Hise (2000) explored four antecedents of E-satisfaction: convenience, merchandising, site design, and financial security. The results indicate that perceptions of convenience have the greatest impact on E-satisfaction followed by perceptions of site design and security. In their study of drivers of E-satisfaction, Bansal (2004) found that ease of use, useful information, and the relative value of a site were significantly related to E-satisfaction. Furthermore, they found that Web site satisfaction was significantly related to customer behavior such as customer referrals and retention, and frequency of visits to the site. Posselt and Gerstner (2005) examined the effect of pre-sale and post-sale satisfaction variables on repurchase intention and overall satisfaction ratings. They found that ease of finding a product, selection of products, clarity of information, and overall look and design of the site during the pre-sale period predicted repurchase intention. Posselt and Gerstner (2005) found that the coefficients for the variables for post-sale were larger than any of the coefficients for measuring pre-sale satisfaction. The above studies indicate that all four stages of the CSLC are important in determining E-satisfaction.

5. Method and data collection

In Phase 1, analysis involved the allocation of weights to determine the relative importance of the unique functionalities for each stage of CSLC as provided by Saeed (2005). In Phase 2, analysis involved regression and ANOVA.

1. Phase 1: Subjective Weights for Functionalities across the CSLC

Phase 1 investigated how important to the customer are specific Web functionalities within each stage of the CSLC. The participants for this research were 190 students enrolled in Hunan university. The sample was limited to students who had made at least three online purchases over the last twelve months. Saeed (2005) identified the Web functionalities for each stage of CSLC and identified 20 functionalities for the requirements stage, 15 for the acquisition stage, 13 for the ownership stage, and 10 for the retirement stage. Some of the functionalities were common amongst all stages of CSLC such as FAQ mechanism and e-mail mechanism. The elimination of common functionalities reduced discriminant validity issues. Therefore, this study focused on 13 unique functionalities for the requirements stage, 10 for the acquisition stage, 6 for the ownership stage, and 3 for the retirement stage.

TABLE 2: UNIQUE FUNCTIONALITIES.FOR EACH STAGE OF THE CSLC DERIVED, FROM SAEED(2005)

CSLC first stage: Require-ments	1.Simple search function; 2.Advanced search function with drop-down list boxes; 3. Advanced search features that turn incorrect queries into correct results; 4.Help features for undertaking search operations; 5.Personalized product recommendation function; 6.Mechanism for reviewing recommendations from other customers; 7.Mechanism for using product information published in paper- based media to search and locate products online; 8.Mechanism for receiving customized newsletter and e-mails; 9.Mechanism for searching product literature and product news; 10.Mechanism for saving a list of products for future purchase; 11.Mechanism for displaying various announcements for customers; 12.Mechanism for comparing products; 13.Mechanism for viewing products.
CSLC second stage: Acquisition	1.Mechanism for helping the customer understand the buying process of the product; 2.Mechanism through which a customer can order products online and pick them up from the nearest physical store; 3.Mechanism for locating a physical store; 4.Mechanism that helps the customer integrate the new purchases he or she intends to make with the purchases that he or she has already made from the online store; 5.Shopping-cart mechanism; 6.Mechanism for providing various financing options; 7.Mechanism that helps the customer apply for credit; 8.One-click mechanism; 9.Shipment tracking mechanism; 10.Mechanism for cancelling an order.
CSLC third stage: Ownership	1.Mechanism that allows the customer to return and exchange defective products; 2.Mechanism that allows customer to return or exchange to the physical store a product bought from the online store; 3.Mechanism that allows the customer to wrote up renews on the product and the purchase experience; 4.Mechanism for sending e-mails on product upgrades; 5.Mechanism for contacting company representatives for after-sales service; 6.Mechanism for accessing product literature on maintaining the product.
CSLC fourth stage: Retirement	1.Mechanism that allows customers to mew information on disposal options; 2.Mechanism for locating special deals for transfer, replacement, and disposal of the product; 3.Mechanism for calculating total cost of ownership of the product

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The functionalities were arranged highest to lowest within each stage to indicate the relative importance of the functionalities per stage. The highest, medial, and lowest weighted functionalities in each stage were used in Phase 2.

2. Phase 2: Determining the Importance of Stages of the CSLC and their Associated Web Functionalities

This study used a multi-criteria decision making method to capture the decision policies of the participants. This method presented the participant with a series of decision situations (scenarios) in which the values on the predictor variables (called cues) were varied. The decision maker reviewed the information presented and provided an overall rating that best summarized the participant's judgment on the scenario presented (Kline&Sulsky, 1995). This model can be stated as:

$$Y_j = \sum_{i=1}^{n} B_i X_{ij} \qquad where j = 1, 2, \ldots\ldots, n$$

Y_j are the judgments (decisions) made by the participant; X_{ij} are the cues (criteria) for each scenario, and B_i is the relative importance of each cue used in evaluating the decision. Also, i indicates the cue in a specific scenario; and j indicates the scenario. The decision was the extent to which the participant was satisfied with the combined set of functionalities presented across the four stages of CSLC. The cues i were the stages of the CSLC (requirements, acquisition, ownership, and retirement) and their specific functionalities. For each scenario j presented, the participant's "policy" for making a decision was captured: how much weight was placed on each cue in making the decision (Kline&Sulsky, 1995). The scenarios were created by listing all possible combinations of functionalities across the stages of CSLC. The decisions made on the duplicate scenarios were examined for consistency. Correlation coefficients (test-retest check) greater than 0.5 indicate consistency in decision-making. SPSS version 16 was used for running regressions and ANOVAs.

6. Result of Phase 1

The online survey was developed using Web functionalities unique to each stage of the CSLC as defined by Saeed (2005). To determine the weights of the Web functionalities, an overall average was computed for each functionality within each stage of the CSLC. The functionalities were sorted highest to lowest within each stage of CSLC to indicate the relative importance of the functionalities per stage. Table 3 shows how important the specific functionalities within each stage of the CSLC are to customers. Table 4 shows how important to customers are specific Web functionalities within each stage of CSLC.

TABLE 3: FUNCTIONALITIES BY CSLC STAGE AND ASSOCIATED WEIGHTS

Requirements		Acquisition		Ownership		Retirement	
No	Weight	No	Weight	No	Weight	No	Weight
1	*16.33	9	*16.29	1	*28.08	2	*44.32
13	15.04	5	14.78	2	24.45	3	*33.19
12	11.91	2	11.74	5	*16.71	1	*22.48
2	*8.79	10	11.48	3	12.90		
6	7.83	3	*11.00	6	10.30		
3	7.54	1	8.75	4	*7.67		
10	7.01	6	8.74				
5	5.72	8	7.56				
9	5.15	4	5.62				
4	4.52	7	*4.03				
7	4.04						
11	3.88						
8	*2.52						

* The highest, medial, and lowest weight for each stage respectively

TABLE 4:HIGHEST, MEDIAL, AND LOWEST WEIGHTED WEB FUNCTIONALITIES PER STAGE OF CSLC

Weight	Require -ments	Acquisi -tion	Ownership	Retirement
Highest	Simple search function	Shipment tracking mechanism	Mechanism that allows the customer to return and exchange defective products	Mechanism for locating special deals for transfer, replacement, And disposal of the product
Medial	Advanced search function with drop-down list boxes	Mechanism for locating a physical store	Mechanism for contacting company representatives for after-sales service	Mechanism for calculating total cost of ownership of the product
Lowest	Mechanism for receiving customized newsletter and e-mails	Mechanism that helps the Customer apply for credit	Mechanism for sending e-mails on product upgrades	Mechanism that allows customers to view information on disposal

7. Result of Phase 2

Using the highest, lowest, and medial weighted Web functionalities identified for each stage in Phase 1, 27 unique scenarios were designed for phase 2 survey The Web page had three links: Apparels, Personal Computers, and books. The 27 unique plus two duplicate scenarios were randomized within each of the three surveys. The independent variables were the cues (stages of CSLC and associated Web functionality) coded as 0, 1, and 2 for the low, median, and high weighted functionalities in each stage. A constraint of policy capturing is the removal of responses that show inconsistent decision making. Regressions on individual responses resulting in R^2 below 0.4 caused that participant's responses to be eliminated from further analysis. The R^2 had been set at 0.5 as a measure of consistent decision making.

Test-retest reliability on the two duplicate scenarios resulted in Pearson correlation coefficients of 0.487 and 0.696 with an average of 0.592 for the overall sample before eliminating participants with a $R^2 < 0.4$. After this elimination, the coefficients were 0.542 and 0.735 with an average of 0.639. Similar to $R^2 > 0.4$, Table 5 shows the Pearson correlation coefficients for each subsample.

TABLE 5 : PEARSON CORRELATION COEFFICIENTS FOR 3 PURCHASES

Subsample	Pearson coefficient of first duplicate	Pearson coefficient of second duplicate	Average
Overall (n=59)	0.542	0.735	0.639
Apparels (n=16)	0.650	0.916	0.783
Personal Computers (n=21)	0.388	0.719	0.554
Books (n=22)	0.659	0.647	0.653
Males (n=28)	0.684	0.782	0.733
Females (n=31)	0.428	0.669	0.549

To answer the question how the presence of specific Web functionalities affected the relative importance of the

individual stages of CSLC in determining customer satisfaction with a Web site, the stepwise regression was conducted on the 59 participants yielding adata set of 1593 records. This regression produced the following equation:

Satisfaction=2.919+0.535(Req)+0.515(Acq)+0.471(Own)
(0.075) (0.069) (0.058)

The above equation indicates that for the overall dataset, the requirements stage as represented by the three levels of Web functionality is most important followed by the acquisition stage and ownership stage in determining E-satisfaction. F (3,1592) =134.161, $p < 0.001$. The R^2 for the model was 0.202; the adjusted was 0.201. The retirement stage of the CSLC did not enter the stepwise regression.

To answer the question how the product being purchased affected the relative importance of the individual stages of CSLC and their specific Web functionalities in determining E-satisfaction, three regressions were conducted-one for each product. The first regression was conducted on the responses of 16 participants taking the apparels survey with subsample of 432 (16x27).

Satisfaction=2.863+0.566(Acq)+0.545(Req)+0.410(Own)
(0.095) (0.088) (0.050)

This equation indicates that when purchasing apparels, the acquisition stage with three levels of Web functionality is most important in determining E-satisfaction. The requirements stage and ownership stage are second and third in relative importance. F (3,431) = 43.255, $p < 0.001$. The R^2 for the model was 0.233; the adjusted R^2 was 0.227. The retirement stage of the CSLC did not enter the stepwise regression.

The second regression was conducted on the responses of 21 participants taking the personal Computers survey, a subsample of 567 (21x27) data records.

Satisfaction=2.869+0.603(Req)+0.495(Own)+0.476(Acq)
(0.097) (0.065) (0.060)

This equation indicates that when purchasing a personal computer, the requirements stage with its three levels of Web functionality is most important in determining E-satisfaction. The ownership stage and acquisition stage are second and third in relative importance. F (3,566)=53.764, $p < 0.001$. The R^2 for the model was 0.223; the adjusted R^2 was 0.219. The retirement stage of CSLC did not enter the stepwise regression.

The third regression was conducted on the responses of 22 participants taking the books survey, a subsample of 594(22x27)records.

Satisfaction=2.853+0.515(Acq)+0.476(Own)+0.462(Req)+0.174(Ret)
(0.063) (0.058) (0.051) (0.007)

This equation indicates that when purchasing a book, the acquisition stage with its three levels of Web functionality is most important in determining satisfaction with a Web site. The ownership stage, requirements stage, and retirement stage are second, third, and fourth, respectively in relative importance. F (4,593) = 31.958, $p < 0.001$. The R^2 for the model was 0.178; the adjusted R^2 was 0.173.

TABLE 6 : RELATIVE IMPORTANCE OF STAGES OF CSLC -REGRESSION RESULTS

Regression	CSLC stage 1	CSLC stage 2	CSLC stage 3	CSLC stage 4
Overall	Requirement	Acquisition	Ownership	
Apparals	Acquisition	Requirement	Ownership	
Personal Computes	Requirement	Ownership	Acquisition	
books	Acquisition	Ownership	Requirement	Retire-ment

TABLE 7: BETA MEANS FOR 3 PURCHASES

	Require -ments	Acquisi -tion	Owner -ship	Retire -ment
Overall	.30576	.32546	.27344	.06136
Apparals	.31275	.35350	.24644	-.01538
Personal computers	.36167	.29143	.30767	.05948
Books	.24732	.33755	.26041	.11895

8. CONCLUSION AND IMPLICATIONS

The results from this study indicate that the relative importance of the stages of CSLC and their associated Web functionalities differ based on the product being purchased.

In Phase 1, It appears that the less personalized the functionality was, the more important it was to the customer. This supports earlier findings that customer preference for personalization and customization may not be strong (Green&Pearson, 2006). The Web functionalities considered most important seemed: simple search for the requirements stage, a tracking mechanism for the acquisition stage, a method for exchanging defective product for the ownership stage, and options for disposal for the retirement stage.

In Phase 2, the overall regression results indicated that the requirements stage was most important followed by the acquisition and ownership stages. Overall, pre-purchase support was considered more important than post-purchase support. Unfortunately, knowing that primary importance is placed on the requirements stage is not beneficial to many organizations because customers can search for a product on one site and purchase it from another site. The requirements stage of the CSLC does not affect long-term firm performance. Organizations should carefully consider this risk associated with any investment in the Web functionality support for the requirements stage.

Products have varying characteristics, so research addressed how the product purchased would affect the relative importance of the stages of the CSLC with the specified Web functionalities. Organizations selling, for example, personal computers should consider investing their resources in building Web functionality to enhance the search capability and customer communication capability of their Web sites to support the requirements stage acknowledging that shoppers can purchase elsewhere. Next, these organizations should invest resources in supporting the ownership stage. On the other hand, organizations selling clothing likely do not need to provide superior support for the ownership stage. These organizations should, according to the results of this study, consider focusing on the Web functionality support for the acquisition stage and requirements stage. Organizations providing superior support for tracking merchandise, locating physical stores, or providing credit opportunities may build an advantage over other organizations.

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This study provide a practical way on determining how to invest organizational resources to provide Web functionality support for CSLC. Conscientiously investing in those resources could improve customer satisfaction with an organization's Web site and make a difference in an organization's performance.

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