AN INTEGRATIVE APPROACH TO UNDERSTANDING CUSTOMER SATISFACTION WITH E-SERVICE OF ONLINE STORES

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ABSTRACT

The proliferation of e-business has intensified competition for online customer satisfaction. Previous research has primarily offered a single view of customer satisfaction from marketing or technical perspective. Although each view has helped improve our understanding of online customer satisfaction, a framework to integrate these viewpoints is missing from the current literature. The service science theory examines customer satisfaction with online services from multiple perspectives. An integrative view of customer satisfaction with e-service is possible with the interdisciplinary lens of service science theory. This study conducted a survey with 377 customers of four online stores. Marketing and technical constructs consisting of twelve key variables were incorporated into a regression analysis to understand the effect of each variable on the dependent variable of customer satisfaction. The analysis results show that although these constructs do have a significant influence on customer satisfaction, not all the variables of each construct have the same effect. Thus it is important to take an integrative approach in examining online customer satisfaction. The findings of this research offer such a view of increasing online customer satisfaction by improving key marketing and technical factors.

Keywords: e-Service quality; Perceived risks; Perceived convenience; Customer satisfaction

1. Introduction

The global competition for e-business is growing in intensity and eroding profit margins so an e-business needs to learn how to differentiate itself from its rivals if it is going to create and sustain competitive advantages. E-service quality has become an important differentiator for e-business success because it is the extent to which an e-business service provider effectively and efficiently manages customer interactions and meets their expectations [Madu and Madu, 2002]. However, measuring e-service quality is a challenge to thee-business because it involves a wide range of attributes including reliability, access, responsiveness, empathy, assurance, ease of navigation, etc. [Kim, Kim, and Lennon, 2006]. The successful delivery of these important features can ultimately lead to customer satisfaction. Therefore, although the methods to effectively measure e-service quality vary with products increasing customer satisfaction is an important goal towards achieving e-business success.

Previous research has proposed many avenues to learn how customer satisfaction can be more effectively improved. One way is to foster a consumer's perceived trustworthiness of Web merchants [Belanger, Hiller and Smith, 2002; Keeny, 1999]. Website design can also influence the perceptions of customers about e-service quality [Liang and Lai, 2002]. Search engine optimization is another quality critical to the increase of customer satisfaction [Otim and Grover, 2006].The cultivation of a shopping environment favoring the convenience element is conducive

to the acquisition of new customers [Torkzadeh and Dhillon, 2002]. Still other avenues focus on improving system and information quality [Hung, Chen, Hung, and Ho, 2013; Chen and Holsapple, 2013; DeLone and McLean, 2003], as well as by avoiding information asymmetry [Pavlou, Liang, and Xue, 2007]. Although there is abundant research examining the growing complexity of customer satisfaction with online services, most of it has adopted a simplified view of examining the effect of individual factors on customer satisfaction, such as risks, shopping experience, service quality, trust, website design and product characteristics. An integrative framework to examine e-business operations from multiple perspectives is missing from the previous study. Such a framework can enable a clearer understanding of the big picture of e-service quality [Collier and Bienstock, 2006]. In order to provide an integrative view of e-business success, this study adopts service science theories [Maglio et al., 2006] to examine e-service quality from consumer, business and technical perspectives. Individual customer's satisfaction with online stores is used as a surrogate measure.

Service science theories assert that the interdisciplinary approach of examining both technical and non-technical factors is effective in understanding the complexity of Internet services [Cardoso, Voigt, and Winkler, 2009]. Online stores are striving to increase customer satisfaction with their services but the presence of technical factors (e.g. website design) alone does not render customer satisfaction [Kaynama and Black, 2000]. Consumer and business factors also need to be considered [Zeithaml, Parasuraman, and Malhotra, 2002]. In the Business to Consumer (B2C) environment, a customer's perceived online shopping attitude, perceived risks, innovativeness, impulse purchasing and perceived convenience are important consumer characteristics [Donthu and Gilliand, 1996]. An increasing number of stores are capitalizing on social media to engage customers and increase their satisfaction via word-of-mouth communication [Zhang and Daugherty, 2009]. The marketing factor of word-of-mouth communication is growing in importance for B2C business. Technical factors, including information, system, and the service quality of online store sites, are fundamental to the successful delivery of e-services. As comparison shopping becomes the norm, customers are purchasing at both the target store and competitors', therefore, it is important to assess the possible effect of these three determinants. This study investigates the potential influence of these consumer, business, and technical factors on customer satisfaction. The findings provide a balanced, integrative view of online customer satisfaction with the e-service quality of online stores.

2. Theoretical foundation

2.1. Dynamics of e-Service Quality in B2C Business

Intangible assets (e.g. order tracking, product information, product price comparison, and customer rating) are primarily involved in the process of delivering B2C products. These assets are complementary services to help customers complete the ordering process. Services have four distinct attributes: intangibility, inseparability, heterogeneity and perish ability [Kotler, 1988]. A customer cannot physically sense and touch goods sold in the electronic marketplace. Many digital products (e.g. music and movie downloading) reserve the inseparability feature because the process of delivering and consuming goods occurs at the same time. The heterogeneity feature is salient in e-business (e.g. e-Bay and e-Trade) because price fluctuations depend on when, where and who orders the products or services. E-business is perishable because each transaction terminates with the successful delivery of the online order. A deeper understanding of e-service quality requires that a theory be adopted to assess the service nature of e-business. The service science theory has the strength of examining a wide variety of service industries with respect to service quality [Nyeck et al. 2002]. This study adopts this theory to examine antecedents of customer satisfaction, an important indicator of e-service quality.

Service quality is the confirmation or disconfirmation experience between customer expectations and the actual services received [Zeithaml, Parasuraman, and Malhotra, 2002]. The higher the disconfirmation gap, the poorer the customer's perceived service-quality level. Narrowing the confirmation gap can help improve the perceived service quality. Improving the confirmation experience with the reliability, assurance, responsiveness, empathy and tangibility of traditional service can lead to enhanced customer satisfaction [Parasuraman, Zeithaml, and Berry, 1988] but e-service delivery is a dynamic process so measuring it requires an integrative approach.

The current e-business research primarily focuses on either marketing or technical factors and their potential effect on customer satisfaction. Studying their joint effect on customer satisfaction is rarely seen in the current literature. In recognizing the research gap, this study proposes that customer satisfaction as an important element of e-service quality is investigated from the marketing and technical perspectives because of the complexity of the online retailing business. As competition in e-business intensifies, word-of-mouth communication is proving to be an effective marketing strategy to increase customer satisfaction [Maznah, 2009]. The proliferation of social media further calls for the attention of online stores in regard to the word-of-mouth marketing strategy. An important attribute of e-service quality in the e-retailing industry is this mushrooming marketing strategy [Goodman, 2009]. Personalized customer services are another important attribute of e-service quality for the success of online stores

[Klie, 2011]. Reputable stores, such as Amazon.com and CitiBank, gain competitiveness via personalized customer services. Understanding customer characteristics (e.g. online shopping attitude, perceived convenience, perceived risks, customer innovativeness, and impulse purchase) can help them enhance the quality of their personalized services.

The DeLone and McLean Information Systems Success theory has been widely adopted by prior studies to examine and measure e-business success [DeLone and McLean 2004; Molla and Licker, 2001]. This theory asserts that information system success needs to consider three important e-service qualities: information, system, and service [DeLone and McLean, 2003]. These attributes affect not only the subsequent use or intention to use, but also user satisfaction. Hence, these three elements are indispensible for an online store to deliver a word-of-mouth marketing strategy and personalized customer services. The burgeoning of comparison shopping is putting online customers in the driver's seat enabling them to navigate between their target online store and competitive stores. An investigation of customer satisfaction with e-service needs to consider not only the e-service quality of the target website, but also of its competitive websites. In the following sections, we will closely examine the potential influence of these marketing and technical factors on customer satisfaction.

2.2. The Effect of Marketing Factors on Customer Satisfaction

E-business success depends on customer satisfaction [Devaraj, Fan, and Kohli, 2002].If customers are happy with their purchase, there will be commitment, loyalty, cross-selling and up-selling opportunities. Many e-businesses (e.g. Amazon, Netflix, Dell and Apple) have become leaders in their areas because their customers have such satisfying shopping experiences. However, not all customers are alike. Customer segmentation is the business practice of grouping customers based on their specific characteristics or behavior, including age, gender, spending habits, religion, and life style. Five customer characteristics are pertinent to the enhancement of customer satisfaction in the B2C context: online shopping attitude, perceived risks, perceived innovativeness, impulse purchasing, perceived convenience, and word-of-mouth marketing.

2.2.1. Online Shopping Attitude

Consumers' attitudes toward online shopping play an important role in the increase of customer satisfaction [Roman, 2010]. User attitudes toward computer systems are highly associated with user satisfaction [Lucas, 1978]. Online shopping depends on the use of computer systems. Therefore, consumers' positive attitudes toward online shopping systems can have a beneficial influence on user satisfaction. Customers with higher computer proficiency are more likely to adopt online shopping than those with lower computer proficiency [Kwak, Fox, and Zinkhan, 2002]. Many online stores help their customers create a more positive attitude toward online shopping via recommendation and user rating mechanisms. In addition, web interactivity channels are being leveraged to help strengthen this positive attitude [Cho, 2010].Consumers are more likely to feel satisfied with services of online stores if they have formed positive online shopping attitudes.

H1: Positive consumer attitudes towards online shopping have a positive influence on customer satisfaction

2.2.2. Perceived Risks

All purchasing activities involve a certain degree of risk [Bauer, 1960]. These risks are perceptional and vary with products and buyers [Alpert, 2008; Taylor, 1974]. A customer's perceived risks can influence their preference and willingness to purchase [Shimp and Bearden, 1982; Van der Heijden, Verhagen, and Creemers, 2003] and they tend to be higher than those for the traditional shopping [Tan, 1999]. Geographic and spatial differences can create a high degree of uncertainty for customers since they are not able to touch and sense goods, or try services before making a purchase decision however some can tolerate higher risks than others. As a result, those with a higher degree of risk tolerance are more likely to accept online shopping than those with a lower degree [Tan, 1999].

In order to reduce a consumer's perceived risks, many online merchants are increasing the amount of relevant information in the shopping process [Kim and Lennon, 2010]. They are introducing product features to potential customers via interactive videos [Alpert, 2008]. Other merchants (e.g. Wal-Mart and Target) allow users to pick up and return goods purchased online to their physical stores. All these approaches help minimize a customer's perceived risks of online shopping. Lowering perceived risks can increase customer satisfaction, thereby increasing their commitment and involvement in the purchasing process [Anvari and Amin, 2010].

H2: Customers' perceived risks have a negative influence on customer satisfaction with online shopping

2.2.3. Perceived Convenience

One major benefit for online shoppers is the removal of physical constraints, including spatial & geographic distance, traditional payment methods and fixed store hours. The removal of these constraints creates shopping convenience. From the economic utility perspective this convenience is comprised of five dimensions: time, place, acquisition, use and execution [Brown, 1989]. Online stores offer customers the convenience of shopping at any time and from any place. They enable customers to complete the transactional process 24/7. Customers are satisfied with online shopping because they can enjoy the benefit of execution convenience [Christodoulides and

Michaelidou, 2011]. Online stores have a wider variety of goods available in their warehouses and are not constrained by limited physical store space. They also offer customers the convenience of comparison shopping and enable them to quickly access preferred goods and services. Online shopping is perceived as advantageous if it offers convenience and cost savings [Khalifa and Liu, 2007]. Online convenience as a part of customer service can lower transactional costs, particularly for busy or uninformed customers who may have high transaction costs [Morton, 2006].

If customers can have enjoyable experiences in a convenient shopping environment not only will consumer satisfaction be enhanced but their custom will be retained.) Online shoppers may have more favorable perceptions of shopping convenience (e.g. access, search and transaction) than in-store shoppers [Beauchamp and Ponder, 2010]. The more convenience offered, the more likely customers are to be satisfied with their online shopping experiences.

H3: Perceived shopping convenience has a positive influence on customer satisfaction with online shopping

2.2.4. Impulse Purchasing

People make impulse decisions when a sudden and compelling purchase prevents them from thoughtfully considering alternative choices [Bayley and Nancarrow, 1998]. Customers constantly convey a favorable evaluation of their own behaviors to reinforce impulse purchase decisions [Dittmar et al., 1996; Rook, 1987]. Such impulse buying can be categorized into four types: (1) planned buying, (2) reminded buying, (3) fashion-oriented buying, and (4) pure buying [Han et al., 1991]. The first three types are rational impulse purchases that are based on emotional preference or objective evaluation, whereas the last type is irrational or compulsory impulse buying [Ko, 1993]. Many online stores purposely offer shopping convenience to customers in order to encourage them to make impulse purchases. Apple's iPod Touch and Sony's e-Readers require that users enter credit card information into their systems so that they can simply use a one-click "Buy" button to purchase songs and books. The typical feature of order confirmation does not exist in the design of these systems. Thus, consumers are more likely to make impulse purchases from these stores because of this one-click shopping convenience [Donthu and Garcia, 1999].

Customer satisfaction indicates post-purchase evaluation after an impulse purchase. Highly impulsive buyers demand for immediate gratification [Hoch and Loewenstein, 1991] whereas rationale buyers are more cautious and are less attracted to impulse purchase behaviors [Thompson et al., 1990]. Although satisfaction may be related to customers' impulse purchase orientation, several studies verified that an impulse purchase was significantly related to regret as to time, place, and product because of not being able to pay much attention to the detail [Spears, 2011]. In other words, the higher the level of impulse purchase, the higher the tendency of regret, incurring lower satisfaction. Because of the potential negative effect of impulse purchasing on customer satisfaction, many online stores have employed user reviews and recommendations to help customers make rational impulse purchase decisions thereby decreasing customer dissatisfaction [Lee and Kacen, 2008]. It is important for an online store to properly assess the potential negative effect of impulse purchasing on customer satisfaction.

H4: Online impulse purchasing has a negative influence on customer satisfaction

2.2.5. Consumer Innovativeness

Consumer innovativeness is a consumer's disposition of trying new and different services instead of sticking with familiar services [Venkatraman and Price, 1990]. Such customers often adopt cutting-edge services earlier than others [Rogers, 2003]. Therefore, customer innovativeness is a determinant for a customer's decision to try fashion goods and cutting edge products [Midgley and Dowling, 1978].

Innovative customers are more likely to adopt and be satisfied with innovative shopping methods, such as online and mobile shopping [Lu, Yao and Yu, 2005]. Online shopping is less likely to deter innovative customers from engaging in it as an alternative to traditional shopping. Online stores often group customers into online shoppers and non-web shoppers based on their innovativeness [Kim, 2005]. Customer innovativeness is an important predictor for satisfaction with novelty products or services [Limayem et al. 2000].

H5: Consumer innovativeness has a positive influence on customer satisfaction with online shopping

2.2.6. Word-of-Mouth Marketing

Word-of-mouth marketing refers to passing product information from one person to another via spoken communications [Arndt, 1967]. A customer who loves a product will spend extra effort informally communicating a product's characteristics to other customers [Westbrook, 1987]. Since information senders and recipients know and trust each other, word-of-mouth is a more effective marketing approach than the mass communication media [Wilkie, 1990]. Although word-of-mouth marketing has a positive influence on a customer's purchase intention, the approach has a negative influence on customer satisfaction if not managed properly [Arndt, 1967].

The Internet transforms the word-of-mouth marketing strategy. A customer can immediately post product reviews on discussion forums, personal blogs or social media (e.g. Facebook and Twitter) after using products. This customer's online friends can be instantly alerted to the customer's positive or negative product reviews. As the network size of the customer is increased, word-of-mouth will have an increased positive or negative effect on

customer satisfaction. Electronic media utilized for word-of-mouth marketing include E-mail, Usenet Groups, Online Forums, Chat Room, Messenger, Bulletin Boards System, Newsgroups, Public Portal, Internet phone, etc. These media eliminate geographic and spatial limitations, and enable two-way communication at any time and from anywhere [Hennig-Thurau et al., 2004]. Information in the digital format can travel much faster and farther than paper-based information [Hanson, 2000]. The benefits of electronic word-of-mouth marketing far exceed the benefits of the traditional word-of-mouth marketing approach [Tanimoto and Fujii, 2003].

Electronic word-of-mouth marketing poses security threats because users can change and conceal their identity and purposely spread words to favor personal opinions. Some companies have leveraged these potential threats by hiring employees to purposely spread positive opinions about their product. Customers are more likely to accept products if other customers share positive information about them [Briggs and Hollis, 1997]. Word-of-mouth marketing is an indispensible element of information flow in the social structure and has a significant influence on online consumer behavior [Godes and Mayzlin, 2004]. Many online customers alter their purchase decisions because of the electronic word-of-mouth effect [Banerjee, 1992]. User ratings, discussion forums, and product demos are typical methods adopted to improve the effectiveness of word-of-mouth marketing [Riegner, 2007]. Such marketing saves customers' time searching for the right information and gives them confidence in making purchase decisions [Vijayasarathy and Jones, 2001]. As a result, electronic word-of-mouth marketing has a positive influence on customer satisfaction.

H6: Electronic word-of-mouth marketing has a positive influence on customer satisfaction

2.3. The Effect of Technical Factors on Customer Satisfaction with e-Service

The information systems (IS) success model asserts that IS quality, including information, system and service quality, can affect a customer's satisfaction and subsequent future decisions [DeLone and McLean, 2003]. The causal relationships between IS constructs and customer satisfaction exist when the use of information systems is voluntary. The competition among online retailers is fierce because the entry barrier to the industry is low and the head-to-head competition is unavoidable. To achieve business success in the online retailing industry, companies need to first and foremost compete with each other on the quality of their sites. Therefore, it is important to examine these three technical qualities from both competing (target) and competed (competitive) companies' websites, and understand how they can affect customer satisfaction.

2.3.1. The Effect of Information Quality on Customer Satisfaction

Information quality is the measure of information system outputs, including information accuracy, timeliness, relevance, aggregation and format [Ahituv, 1980]. A customer's perceived value of these measures varies with services. Online investors care more about market and product information accuracy and timeliness. In contrast, online customers are concerned with buying quality products at the lowest price. Thus, information relevance and aggregation are more important to them [McKinney, Yoon, and Zahedi, 2002]. Information quality is an essential element of e-business success [Liu et al., 2001]. Customers provided with quality information are more likely to be satisfied with their purchase decisions.

H7: Information quality of the target website has a positive influence on customer satisfaction

Information system quality is an overall representation of the entire system [Bharati, 2003], including the front-, back-end and middleware systems. Important quality attributes of front-end systems include database content, system flexibility, and a user-friendly interface [Emery, 1971]. Back-end system quality attributes consist of system reliability, bandwidth design and system response time [Hamilton and Chervany, 1981]. Middleware integrates diverse front- and back-end systems and optimizes the overall performance of the entire system. System quality is a measure of all engineering-oriented performance attributes [DeLone and McLean, 2003]. Customers are more likely to have satisfying online shopping experiences when a merchant's website reaches its maximum performance.

H8: System quality of the target website has a positive influence on customer satisfaction

IS service quality is growing in importance for online stores because of increased competition. Service quality is the confirmation or disconfirmation experience between customer expectations and the actual services received by a customer [Zeithaml, Parasuraman, and Malhotra, 2002]. Service quality is a measure of IS success with respect to three classes of IS utilization measures: users' dependence on system use, use vs. non-use, and use frequency [Trice and Treacy, 1986]. Service quality is high if the level of service actually delivered exceeds the level of the consumer's expectations [Parasuraman, Zeithaml, and Berry, 1988]. On the contrary, service quality is low if the level of service delivered is below consumer expectations. To narrow the perceptional gap, online stores should improve the service quality of their website, including reliability, responsiveness, competence, access, courtesy, communication, credibility, security, etc.

IS service quality is an important determinant for consumer satisfaction [Conrath and Mignen, 1990]. Many measures can be put in place to help improve IS service quality. These measures include a friendly website design, fulfillment efficiency, system reliability, ease of privacy control, security improvements, and better customer service

[Wolfinbarger and Gilly, 2003]. E-service quality is defined as "the extent to which a website can facilitate efficient and effective shopping, purchasing and delivery" [Parasuraman, Zeithaml and Malhotra 2005, p. 5]. E-service quality comprises eleven dimensions, including IS reliability, responsiveness, accessibility, flexibility, ease of navigation, efficiency, assurance, security, price information, site aesthetics, and personalization. Upgrading the quality of these measures can enhance consumer satisfaction. The improvement of overall service quality can have a positive influence on general customer satisfaction [Joseph and Taylor, 1992].

H9: Service quality of the target website has a positive influence on customer satisfaction

2.3.2. Information quality of a competitive website

Customers shop for goods and services not only from target websites, but also from competitors' websites. A smart-phone buyer will compare iPhone, Blackberry, Android, and Windows 7 phones before making a final purchase. Therefore, customer satisfaction depends on positive shopping experiences not only with the target website, but also with competitive websites [Kumar, 2002]. Customers often compare the information quality of the target and competitive websites, particularly when they need to make decisions between two competitive products [Droge et al., 1997]. If the information quality of a competitive website is better than that of the target website, customers are more likely to feel disappointed with their online shopping experiences.

H10: Information quality of a competitive website has a negative influence on customer satisfaction with the target website

The information system quality of target websites has a positive influence on customer satisfaction, as can that of competitive websites. In the process of comparing product and price information, customers navigate from a target website to competitive websites, and vice versa. A satisfying customer experience with a competitive website can discourage customers from returning to the target website

H11: System quality of a competitive website has a negative influence on customer satisfaction

A company needs to constantly remain attentive to changing consumer demand [Lusch and Laczniak, 1987]. Many companies have turned to improving service quality in order to stay competitive [Lytle et al. 1998]. IS service quality adds value to the services [Groenroos, 1997]. Companies have leveraged IS service quality in order to gain a competitive edge over rivals [Hummel and Savitt, 1988]. The significant increase of the market share of online search engines (e.g. Google) takes huge business from the traditional advertising firms (Omnicom Group) and online portal firms (e.g. Yahoo). The landscape shift of the advertising business affirms that IS service quality (e.g. information quality, system quality and service quality) is growing in importance. Therefore, the service quality of a competitive website can have a negative influence on a customer's satisfaction with his target website. Any competitor websites which are strong in these areas of IS service quality can easily lure customers away from their target websites. Thus, improving information quality, system quality and service quality of competitive websites can have a negative influence on customer satisfaction with the target website.

H12: Service quality of a competitive website has a negative influence on customer satisfaction with the target website.

The previous discussion leads to the development of Figure 1 that depicts the causal relationships between customer satisfaction and its twelve antecedents from the marketing and technical perspectives. Hypotheses H1 to H5 are to assess the relationships between consumer constructs and customer satisfaction. H12 is to assess the potential influence of the word-of-mouth marketing factor on customer satisfaction. Hypotheses H6 to H11 are to assess the relationships between technical constructs and customer satisfaction.

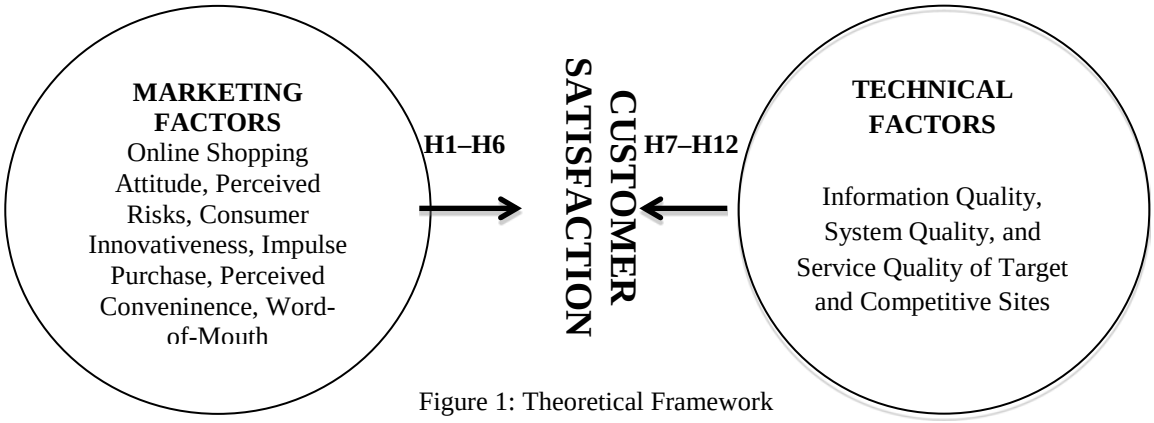

Figure 1: Theoretical Framework

3. Research methodology

An online survey was conducted with subjects who had had experiences of shopping from at least two online stores. An online survey is an appropriate and reliable method because the objective of this study is to assess online customer behavior [Hoffman and Novak, 1996]. The online survey was posted on Taiwan Yahoo! for one month. Prospective subjects were able to learn about the survey from Yahoo auction sites and Yahoo discussion forums. In order to increase the participation rate, we also posted an online survey invitation on a bulletin board.

Subjects filled out information about their experiences of shopping with two online stores (Stores A and B). Store A was the subjects' preferred online store. Store B was the second most preferred store. Subjects were asked about their most recent shopping experiences with Stores A and B. Answering the survey questions based on their most recent shopping experiences helped minimize the information errors caused by memory loss. The survey instrument contained two parts. The first collected demographic data, including gender, age, educational background, annual salary, Internet use experience, etc. The second included questions used to measure the studied constructs. In order to improve the content validity, a panel of experts was invited to check the wording and syntax of the questions and those with errors were subsequently removed. A pilot study using twenty subjects with online shopping experiences was conducted to ensure that the meaning of the questions was understood. The original questions were revised by incorporating this feedback and were then used to conduct the full-scale study.

Twenty prizes, including a NDSLite, an iPod shuffle, a 2G MP3 player and a 7-11 gift card, were prepared and randomly drawn in order to increase participation rate. A total of 394 samples were collected. We conducted the Box Plot analysis to locate potential outliers and removed 17 of them from the final analysis. A total of 377 valid samples were collected. The response rate of this online survey was 95.69%. There were 155 males and 222 females, accounting for 41.11% and 58.89% of the respondents, respectively.

3.1. Development of Measurement Instrument

This study adopted Donthu and Gilliand's [1996] survey instrument to measure the multi-attributes of consumer attitudes, including the online shopping attitude, perceived risks, consumer innovation, impulse purchasing and convenience. This survey instrument adopted/used a 7-point Likert's scale with 1 = "strongly disagree" and 7 = "strongly agree". Information quality can be measured separately from system quality because the content and content-delivery web system can be individually examined [McKinney et al., 2002]. Information quality is a multi-attribute construct, including relevance, understandability, reliability, adequacy, scope, and usefulness [McKinney et al., 2002]. McKinney et al.'s [2002] survey instrument was adopted to measure these attributes. System quality is also a multi-attribute construct, including access, usability, entertainment, hyperlinks, navigation, and interactivity [McKinney et al., 2002]. And again, McKinney's [2002] survey instrument was adopted to measure these attributes. Service quality is the overall evaluation of services with respect to their relative superiority [Parasuraman et al., 1988]. Some studies have compared traditional service with e-service quality [Zeithaml et al., 2002]. This study adopted Devaraj et al.'s [2002] survey instrument to measure e-service quality with respect to reliability, responsiveness, assurance, and empathy.

This study defines word-of-mouth marketing as the use of Internet applications to facilitate a customer's informal communication about services. Bansal and Voyer's [2000] survey instrument was adopted to measure the online word-of-mouth marketing. This survey instrument adopted the 7-point Likert's scale with 1 = "strongly disagree" and 7 = "strongly agree". The satisfaction level will be lower if the purchased goods do not meet the customer's expectation. Satisfaction is an important determinant for information system success [DeLone and McLean, 2003; McKinney et al., 2002]. This study adopted Spreng, Harrell, and Mackoy's [1995] instrument to measure customer satisfaction with online shopping. Appendix I lists all items used to measure each construct of this study.

4. Data analysis

We analyzed the distribution of subjects by age, educational background, marriage, and profession. Subjects between age 21 and 25, accounted for 63.4% of the sample, followed by other age groups. Those with a college degree and currently studying in college accounted for 75.86% of the sample. Since the majority of participants were college students or graduates, most of them were not married and accounted for 95.76% of the sample. Students accounted for 59.95% of the sample. Only 7.96% of subjects had less than one-year of online shopping experience. We considered these subjects as novice online shoppers. Most were experienced online shoppers (92.04%). More than 90% of subjects shopped at least once in six months. Subjects were also asked which websites they shopped from. In order to understand if the demographical data would have an influence on the statistical test results, we conducted a t-test on all variables. In consideration of the potential effect of data collected in the beginning and the latter stages, we entered the average value of each variable for the t test. The test indicated that none of these nine

variables had a significant effect on the collected data. This finding warranted our further testing of the causal relationships between the studied constructs.

4.1. Reliability and Validity Analysis

All Cronbach's α values exceed 0.7 and have a very high reliability (Table 1) [Straub, 1989; Kerlinger and Lee, 1999]. In order to improve both the internal and external validities, we assessed our survey instrument with respect to its content, construct, and criterion-related validity. Information systems experts were invited to assess the content validity of the survey questions. We made changes to the original questions based on the feedback of these experts. Construct validity was first assessed by conducting the principal component analysis, followed by the Varimax method to maximize it. KMO values of all constructs exceeded the threshold value of 0.5 [Hair et al., 2006]. In addition, Bartlett's tests of all constructs are significant ($p<0.01$). Positive results of these two tests indicate that the survey instrument has high construct validity and can be entered for factor loading analysis.

Table 1: Reliablity Test Results

Constructs	# of Items	Reliability Test (Cronbach's α Values)
Online Shopping Attitude (OSA)	3	0.956
Perceived Risks (PR)	3	0.794
Customer Innovativeness (INO)	3	0.828
Impulse Purchase (IMP)	2	0.899
Perceived Convenience (CON)	2	0.803
Information Quality of Target Website (IQ)	6	0.951
System Quality of Target Website (SYSQ)	6	0.898
Service Quality of Target Website (SERQ)	13	0.937
Information Quality of Competitive Website (CIQ)	6	0.949
System Quality of Competitive Website (CSYSQ)	6	0.889
Service Quality of Competitive Website (CSERQ)	13	0.951
Word-of-Mouth Marketing (WOM)	7	0.862
Customer Satisfaction with Online Stores (SAT)	4	0.945

The initial factor loading analysis showed that the first question, used to measure the variable of word-of-mouth, failed the factor loading test because the values are below the threshold value of 0.3. It was the same for the third question, used to measure the variable of perceived convenience. After removing these two questions, all other questions used to measure each construct have loadings exceeding the threshold value of 0.3.

After the data was collected, we assessed whether it would have a normal distribution. The Probability Plot test was performed and showed that all the data was distributed in a 45-degree slope from bottom left to top right i.e. it was normally distributed. Furthermore, Pearson's Correlation analysis was conducted to assess if any correlations between variables existed. Our results showed a maximum correlation coefficient for the relationships of variables was 0.665. This value is below the threshold of 0.8, indicating that none of studied variables have a high correlation with each other. The Variance Inflation factor (VIF) analysis was further conducted to measure the impact of collinearity among the variables in our proposed regression model. VIF values that exceed 10 indicate the presence of high multicollinearity. Table 2 shows that all VIF values are much below the threshold value and the multicollinearity concern can be removed.

Convergent and discriminant validity are two important dimensions of construct validity. Table 3 provides the correlation matrix with the square roots of the Average Variance Extracted (AVE) for each construct reported on the diagonal. Convergent and discriminant validity can be verified when the square root of the construct's AVE is larger than the correlations with other constructs, and convergent validity can be further verified when item loadings on hypothesized constructs are greater than 0.50 [Wixom and Watson 2001]. As seen in Table 3, the square roots of the constructs' AVEs are larger than their cross-correlations, indicating that the variance explained by each construct is larger than the measurement error variance. Convergent validity was further verified as all items loaded greater than .50 on their associated constructs. This test result indicates that all questions in the revised survey instrument have high discriminant and convergent validities. We therefore used the revised survey instrument for the full-scale study.

Table 2 Variance Inflation Factor Analysis

Variables	VIF Values
Online Shopping Attitude (SA)	1.322
Perceived Risks (PR)	1.608
Customer Innovativeness (INO)	1.265
Impulse Purchase (IMP)	1.775
Convenience (CON)	1.124
Information Quality of Target Website (IQ)	2.252
System Quality of Target Website (SYSQ)	2.220
Service Quality of Target Website (SERQ)	2.367
Information Quality of Competitive Website (CIQ)	2.889
System Quality of Competitive Website (CSYSQ)	2.393
Service Quality of Competitive Website (CSERQ)	2.739
Word-of-Mouth Marketing (WOM)	1.333

Table 3 Convergent and Discriminant Validity Test Results

	CIQ	CSERQ	CSYSQ	IMP	INO	IQ	SA	CON	PR	SAT	SERQ	SYSQ	WOM
CIQ	**0.86**												
CSERQ	0.61	**0.77**											
CSYSQ	0.62	0.66	**0.76**										
IMP	0.22	0.19	0.22	**0.77**									
INO	0.23	0.29	0.22	0.36	**0.94**								
IQ	0.67	0.41	0.40	0.19	0.29	**0.97**							
SA	0.34	0.27	0.26	0.32	0.27	0.29	**0.95**						
CON	0.08	0.04	0.10	0.37	0.12	0.12	0.07	**0.82**					
PR	0.11	0.15	0.16	-0.25	0.06	0.18	0.01	-0.18	**0.85**				
SAT	0.42	0.46	0.40	0.15	0.21	0.54	0.31	0.03	0.04	**1.18**			
SERQ	0.48	0.64	0.47	0.15	0.28	0.53	0.24	0.01	0.16	0.68	**0.99**		
SYSQ	0.47	0.52	0.52	0.12	0.28	0.52	0.30	0.05	0.16	0.59	0.64	**0.77**	
WOM	0.31	0.29	0.35	0.18	0.21	0.34	0.27	0.14	0.04	0.45	0.39	0.44	**0.74**

4.2. Hypothesis Testing Results

Structural Equation Modeling (SEM) was performed to calculate the estimated path coefficients, path significance and R2 values. Table 4 shows the SEM test results, including path coefficients and their respective t-statistics. Six of the twelve hypotheses were supported at either $p<.01$ or $p<.05$. As shown in Table 4, Hypothesis 1 (H1) was supported indicating that online shopping attitude has significantly positive effect on the increase of customer satisfaction with online store services. H2 was supported indicating that perceived risk has statistically significant negative impact upon customer satisfaction. H3, H4, and H5 were rejected indicating that customer innovativeness, impulse purchase and perceived convenience have no effect on customer satisfaction. H6 was supported, indicating that word-of-mouth has positive effect on customer satisfaction. H7, H8, and H9 were supported, indicating that the target website's information quality, system quality, and service quality have positive effect on customer satisfaction. On the other hand, H10, H11, and H12 were rejected, indicating that the competitive website's information quality, system quality, and service quality have no effect on customer satisfaction. All these twelve factors together can explain 56.6% (R^2 value) of the variance in customer satisfaction. In addition, target e-store's service quality (**β**=0.429) has the largest impact on user satisfaction, followed by

information quality (**β**=0.249), word-of-mouth (**β**=0.148), system quality (**β**=0.147), perceived risks (**β**=-0.103), and online shopping attitude (**β**=0.088).

Table 4 SEM Test Results

Hypothesized Paths	Path Coefficients (**β**)	T-statistics
H1: SA→ SAT**	0.088	2.158
H2: PR → SAT**	-0.103	1.981
H3: INO → SAT	-0.058	1.489
H4: IMP→ SAT	-0.00	0.006
H5: CON → SAT	-0.039	0.801
H6: WOM → SAT***	0.148	3.220
H7: IQ → SAT***	0.249	4.141
H8: SYSQ → SAT***	0.147	2.622
H9: SERQ → SAT***	0.429	7.078
H10: CIQ → SAT	-0.105	1.557
H11: CSYSQ → SAT	0.041	0.662
H12: CSERQ → SAT	0.011	0.164

* P <0.1; ** P<0.05; *** P<0.01

5. Discussion

E-business success research has focused extensively on the factors that foster the continuous improvement of e-service quality in the B2C context. This prior research has focused on marketing factors and the system design of the website that facilitate e-business success via customer satisfaction. However, most studies have chosen to study only one factor over the others. Little attention has been given to the joint effect of these factors on customer satisfaction. This study adopts the service science theory to investigate the joint effect of the consumer, marketing, and technical constructs. Our research shows that customers' perceived service quality exhibits the largest effect on customer satisfaction among all twelve factors examined in this study. This direct effect is evident in many e-commerce settings [Kassim et al., 2010]. Service quality satisfaction ensures the creation of ongoing sales revenues [von Freymann and Cuffe, 2010]. Leading retailers, such as Wal-Mart, allow customers to return goods purchased online to any of their physical stores. These customers are happy with the service quality because the online system integrates customer information across sales channels.

Information quality is the second most important element of customer satisfaction. In online retailing, it can enhance customer satisfaction and loyalty [Jaiswal et al., 2010]. This finding is also applicable to the online auction business model [Sun, 2010]. System quality has a positive influence on customer satisfaction. This finding corroborates most findings in the B2C E-commerce context [Lin, 2007]. Information quality, system quality, and service quality are the three primary contributors to user satisfaction in regard to information systems [DeLone and McLean, 2003]. This study further confirms the importance of measured customer satisfaction through these three attributes.

Web 2.0 technologies are putting customers in the driver's seat of word-of-mouth marketing via posting reviews, sharing photos, and adding new postings to a Weblog or Wiki. Since word-of-mouth marketing requires extra time and effort, those customers who are very pleased or displeased with their purchases are more likely to engage in such an activity. When customers are unhappy with their purchased services, they express negative emotions electronically by posting comments on the social networks or emailing friends. This dysfunctional behavior can cause customers frustration and attrition [Tuzovic, 2010]. On the other hand, customers, who are satisfied with products and/or services, will positively influence their friends through word-of-mouth [Kassim et al., 2010]. Many vendors have utilized Web 2.0 technology to create campaigns for their services, and/or against their competitors. This study confirms the usefulness of word-of-mouth marketing for increasing customer satisfaction with online shopping.

Electronic payment is an indispensable service for e-business. However, potential security threats (e.g. identity theft and computer viruses) have deterred customers from providing their credit card information and completing the entire shopping process. To prevent them from abandoning their shopping cart, online merchants need to make

efforts to reduce their customers' perceived risks. Some typical efforts of lowering the degree of perceived risks include the adoption of security seals (e.g. VeriSign and Truste), customers' testimonials, the option of reviewing orders, and the creation of a virus-free environment. As part of perceived online shopping attitudes, the credibility perception for online stores can increase customer satisfaction [Breitsohl et al., 2010]. For instance, they can post a clear privacy policy on their website and respond to customer inquiries promptly.

Not all customers are receptive to online shopping. Another way to make customers feel comfortable is to increase their computer expertise and proficiency. Some stores offer a video introduction about their transactional process or allow customers to try using the shopping cart system to purchase free goods. These measures can help improve the perceived attitude towards online shopping which has a positive influence on customer satisfaction [Madlberger, 2006].

Contrary to our expectation, customer innovativeness, impulse purchase, and perceived convenience have no significant influence on customer satisfaction. Customer innovativeness is the willingness of customers to try a new method or a new technology [Agarwal and Prasad, 1998]. Consequently, innovative customers tend to have more positive perceptions to the advantages of a specific innovation [Robinson, Marshall and Stamps, 2005]. Since online shopping becomes a common practice and is no longer considered an innovation technology from customer's perspective, this may explain the weak explanation of customer innovation for their satisfaction. As for the weak influence of impulse purchase, it may have to do with the collectivism culture. Subjects participating in this study are primarily collectivists. Although the collectivism culture may help predict impulse purchasers' satisfaction, the essential element of having another person is missing at the time of each impulse purchase [Lee and Kacen, 2008]. That may explain why the effect of impulse purchase is largely reduced in the online shopping environment. Although the transaction costs can be reduced via e-business, customers may be overloaded with too much information to find shopping a satisfying experience. They often end up wasting time when comparing one product with another if they do not know exactly what they are looking for. This may explain why perceived convenience has no effect on customer satisfaction. A study shows that a required wait can actually signal quality to consumers, thereby increasing customer satisfaction and purchase decision [Giebelhausen, Robinson and Cronin Jr., 2011].

6. Limitations

The information quality of online shopping websites can be further divided into product information and service information quality [Park and Kim, 2006]. Each of these types may have a varying effect on customer satisfaction but this study did not make this distinction.

System quality represents the overall performance of a system [Bharati, 2003]. It refers to the reliability, responsiveness and availability of website services. Poor system and service quality can result in website inaccessibility, even if the information quality is good. In order for customers to appreciate system and service quality, they need to spend more time using vendors' websites. Since we asked customers regarding their perceptions of the target and competitive websites, they now spend more time using the target website than the competitive website. As a result, our testing results do not support our hypotheses that system quality and service quality can have a negative influence on customer satisfaction with the target website. If we could control the time the participants are exposed to both target and competitive websites, we could better assess the potential influence of system and service quality on customer satisfaction.

Reverse logistics is an essential element of transactional easiness. If customers can buy goods from an online store but then return them to any of its physical stores, they are more likely to make an impulse purchase. Data was collected from online stores in Taiwan where exchange, return and refund services are rare practices. The absence of these practices can potentially create shopping difficulties. This business norm difference in the reverse logistics practices could be the main reason for the surprising result. However, this study did not assess the potential influence of varying e-business norms. The findings may not be applicable to other e-business models. Future research could try to replicate the findings of this study to other e-business models. New factors could also be incorporated into the design to discover their importance with respect to increasing customer satisfaction in other e-businesses.

7. Implications

The existing literature primarily examines e-business success via a single perspective. This study offers an integrated view of the marketing and technical constructs pertaining to the improvement of customer satisfaction in the B2C context. Our findings indicate that all of these constructs have differential impacts on customer satisfaction. They provide insights on how online vendors could prioritize service offerings in order to increase customer satisfaction. The hidden nature of high initial fixed costs and low marginal costs makes it difficult for many companies to sustain their e-businesses [Grover, Ramanlal, and Pradipkumar, 2004]. Leading e-businesses often

produce higher marginal revenue than marginal costs and quickly expand their customer base. The key controlling factor for rapid expansion is customer satisfaction. This study proposes an integrative framework to investigate the differential effects of marketing and technical factors on customer satisfaction in the B2C environment.

Online merchants should examine their system quality in relation to major competitors' system quality because customers are inclined to compare product and pricing information across websites. They should particularly focus on improving information quality because customers primarily rely on this attribute to decide if they would like to stay with their preferred merchant or defect to its main competitor. Customers often choose to shop from their favorite merchant if they are satisfied with its information, system and service qualities. The probability that customers will stay loyal to their favorite sites is high as long as their information quality is superior to that of their main competitors. An online merchant needs to continually make sure that its information quality is always unrivalled. Many banks are increasing website usability and improving personalized services in order to improve customer satisfaction [Casalo, Flavian, and Guinaliu, 2008]. A profitable cycle can be created as a result of improving the effect of information quality on customer satisfaction.

The influence of word-of-mouth marketing on the Internet far exceeds that of the traditional word-of-mouth marketing [Tanimoto and Fuji, 2003]. This online information sharing exerts a strong influence on the decisions of its shoppers [Bickart and Schindler, 2001]. Disparity between customer wants, needs and perceptions can influence a customer's purchase decisions [Sirgy, 1982]. Through word-of-mouth marketing, a company can increase customer satisfaction by narrowing this disparity. Top product reviews from customers are an example of electronic word-of-mouth marketing used to increase customer satisfaction.

The entry and exit barriers are low for customers to navigate from one online merchant to another because switching costs are minimal. Customer satisfaction becomes an important vehicle to raise the entry and exit barriers, thereby increasing customer commitment and loyalty. Word-of-mouth marketing is an effective approach to increasing the satisfaction level. The perceived online shopping attitude is a prerequisite to customer satisfaction. Online merchants should try to improve the customer's perceived attitude via creative solutions, such as decreasing perceived negative perceptions [Roman, 2010], brand equity, free trials to gain experience [Kwon and Noh, 2010], and online reviews.

8. Conclusion

Customer satisfaction is essential to the sustainability of e-business success. Many avenues can be used to increase customer satisfaction with online stores. This study investigates the differential effects of marketing and technical quality on customer satisfaction. Our findings show that the service quality of target websites has the largest, lasting impact, followed by the information quality, the system quality, the perceived risks, perceived online shopping attitudes, and word-of-mouth marketing. Online merchants should focus on aligning and improving these e-service qualities to increase customer satisfaction, thereby sustaining their businesses.

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APPENDIX I: Survey Instrument

MARKETING FACTORS
Online Shopping Attitude (SA)
1. Online shopping is fun.
2. I get a real high from online shopping.
3. Buying things online makes me happy.
Perceived Risks (PR)
1. I would rather be safe than sorry.
2. I want to be sure before I purchase anything.
3. I avoid risky things.
Perceived Convenience
1. I hate to spend time gathering information on products.
2. I do not like complicated things.
3. It is convenient to shop from home.
Electronic Word-of-Mouth (WOM) Marketing
1. Give little new information
2. Has significant influence on my purchase decision
3. Mention helpful things
4. Provide different ideas
5. Does not change my mind
6. Really help
7. Influence in service
TECHNICAL FACTORS
Information Quality of Online Store A (same set of questions repeated for Online Store B)
1. Relevance: In general, information on the shopping site is relevant to your purchase decision
2. Understandability: In general, information on the shopping site is understandable for you in making purchase decision
3. Reliability: In general, information on the shopping site is reliable for making your purchase decision
4. Adequacy: In general, information on the shopping site is adequate for your purchase decision
5. Scope: In general, information on the shopping site covers a broad scope for your purchase decision is
6. Usefulness: In general, information on the shopping site is useful in your purchase decision
System Quality of Online StoresA and B
1. Access: In general, the shopping site provides good access
2. Usability: In general, the shopping site is user-friendly
3. Entertainment: In general, The shopping site is entertaining
4. Hyperlinks: The shopping site has an adequate number of links
5. Navigation: In general, the shopping site is easy to navigate
6. Interactivity: In general, the online store can actively participate in creating your desired product
Service Quality of Online Stores A and B
1. I believe that online shopping is reliable.
2. I believe that what I ask for is what I get in online shopping.
3. I think that the online store I purchased from performs the service right.
4. I trust the online store to deliver the product on time.
5. I believe the online store is responsive to my needs.
6. In the case of any problem, I think the online store will give me prompt service.
7. The customer service team at the online store will address any concerns that I have.
8. I felt confident about the online purchase decision.
9. I feel safe in my transactions with the online store.
10. The online store had answers to all my questions about the product.
11. The online store remembers/recognizes me as a repeat customer (after the first time).

12. I think online shopping can address the specific needs of each customer.
13. I was satisfied with the payment options (e.g., different credit cards) at the store I shopped.
Customer Satisfaction with Online Stores A and B
1. I am very dissatisfied with my online shopping experiences
2. I am delighted with my online shopping experiences
3. I am very dissatisfied with my online shopping experiences
4. I am not at all satisfied with my online shopping experiences

Note: This survey instrument adopted/used a 7-point Likert scale with 1 = “strongly disagree” and 7 = “strongly agree”.