Predicting Online Customer Shopping Behavior

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INTRODUCTION

Business-to-consumer (B2C) is the most common online business type, which attempts to reach individual consumers. Compared to the brick-and-mortar environment, the use of the Internet for business-to-consumer transactions presents obvious advantages. The openness of the Internet creates opportunities for virtually all companies ranging from small start-ups to Fortune 100 companies. In particular, it allows companies to offer direct sales to their customers through an electronic channel (Hoffman, et al, 1996). In the bricks-and-mortar stores, sales people are hired to distinguish shoppers and to stimulate their maximum consuming desire based on their in-store behavior. When shoppers show special interest in some specific product, sales people will help them find what they are looking for. In other cases, for shoppers who are merely window shopping, sales person can recommend some product to entice their shopping appetence. However, in the virtual shopping environment, there is no sales person to perform this role. Therefore, to understand consumer behavior in virtual stores is very important for online business. This research aims to provide theoretical analysis to explain consumers' shopping behavior in virtual stores. We first review literatures on aspects of customers' online purchasing behavior, and then propose a model for customer online behavior.

FACTORS INFLUENCING CUSTOMERS' ONLINE PURCHASING

Understanding people behavior in the online marketplace can help online business to primarily focus on their target customers, predict customers' purchasing behavior and make more profit through online channel. Bellman et al (1999) described some factors that predict customer buying behavior: look for product information, months online, number of daily emails, work online at work every week, read news online at home every week, total household working hours, click on banners, and agree that Internet improves productivity. The authors believe that looking for product information is the most important predictor of online buying behavior.

Laudon and Traver (2001) list some aspects of consumer profile to explain customer online behavior. Intensity of usage is the frequency of daily use of various Internet features. The longer time users spend online, which make them more comfortable and familiar with Internet features and services, the more services they are likely to explore (Rainie & Packel, 2001). Scope of use is the range of online activities by customers. Demographics and access is the Internet access preference of different demographic groups. Some demographic groups, based on age, income, gender, and education, have much higher percentages of online usage than other groups (Rainie & Packel, 2001). Ethnicity is also a factor that can differentiate Internet access attitude among different ethnic groups though variation across ethnic groups is not as wide as across age groups (Rainie & Packel, 2001). Traditional media, such as TV, are competing with the Internet for consumer attention. Media choices therefore also impact consumer online behavior. Education, lifestyle and gender also affect customer online shopping behavior.

Ho and Wu (1999) demonstrate positive relationships between online shopping behavior and five categories of factors, which include e-stores' logistical support, product characteristics, web sites' technological characteristics, information characteristics, and homepage presentation. Based on an online survey, Li et al (1999) believes that income, education, accessibility, communications and distribution, convenience, experiential and channel knowledge have positive relationship with online buying while as gender also impact the online buying, in which male is more likely to buy online.

Based on an empirical study, Kim et al (2000) discovers that customer lifestyle and income are significantly related to purchasing behavior on the Internet. Customers who are more price-oriented and/or time-oriented perceive more benefit and less risk through online shopping. Customers who have more disposable income perceive have more preference to purchase online. Slyke et al (2002) explores gender differences with respect to online shopping. The results from this study reveal that gender is significant predictor of customers' online purchasing behavior. Male are more likely than female to purchase products and/or services online. A study from Rodgers and Harris (2003) also support this hypothesis and further explain the causes of this result based on gender differences of emotion and trust. Chau, et al (2002) and Chang & Samuel (2004) also find that consumers in different location with different culture background not only use the Web for different purposes but also perform differently in their purchasing behavior even under the same virtual environment.

Related to online shop profile, Wolfinbarger and Gilly (2000) identify five factors that impact goal-oriented online shopping behavior. Many users currently prefer to undertake efficient online searches, which offer them the fewest number of clicks to get the information they want (Hoque and Lohse 1999). As a result, accessibility or convenience becomes very important to online customers. Selection is the range of product available to the customers. Information availability represents how well the information of product is provided by the online shop. Control of sociality and commitment to goal, demonstrated by the authors, are also important factors related to customer online shopping behavior.

In order to attract customers to visit and revisit their sites, *online* retailers need to build better *websites* to meet the customers' needs and should take a position from a customer's perspective instead of their own perspective (Kim, et al., 2003). To build a more efficient virtual shop to attract more customers' purchasing, Haubl and Murray (2001) believe that a selective recommendation agent can play a prominent role to persuade consumers' purchase decision in a virtual shopping environment. Their findings suggest, "an electronic agent have the potential, whether intentionally or unintentionally, to persuade users that certain alternatives are preferable to others." Shim et al (2002) also emphasize convenience of site use and simplicity of site design as the key factors to influence the online customer satisfaction, which will further impact customers' online purchasing behavior. Website brand name is another factor influencing customers' online purchasing decisions (Ibeh, et al. 2005). Customers prefer to purchase on popular websites instead of unknown websites.

Table 1.   Factors influencing online shopping behavior

Profile	Factors	Research Authors
Customer Profile	Look for product information, Months Online, Number of daily emails, Work online at work every week, Read news online at home every week, Total household working hours, Click on banners, Agree that Internet improves productivity	Bellman et al (1999)
	E-stores' logistical support, Product characteristics, Web sites' technological characteristics, Information characteristics, Homepage presentation	Ho and Wu (1999)
	Income, Education, Experiential, Gender, Channel knowledge	Li et al (1999)
	Lifestyle, Income	Kim et al (2000)
	Intensity of usage, Scope of Use, Demographics and Access, Ethnicity, Education, Gender, Lifestyle Impacts, Media Choices	Laudon and Traver (2001)
	Gender	Slyke et al (2002)
	Culture	Chau et al (2002)
	Gender	Rodgers & Harris (2003)
	Gender, Age, Income, Location	Chang & Samuel (2004)
Online Shop Profile	Accessibility, Communications and distribution, Convenience	Li et al (1999)
	Accessibility/Convenience, Selection, Information Availability, Control of Sociality, Commitment to Goal	Wolfinbarger and Gilly (2000)
	Recommendation agent	Haubl and Murray (2001)
	Convenience, Simplicity	Shim et al (2002)
	Online Store usefulness, Online Store enjoyment, ease of use, Online Store Style, Enterprise Image, Financial Settlement Performance, Logistical Settlement Performance	Van der Heijden and Verhagen (2004)
	Promotion, Services, Ease of use and Navigation, purchase facilitation	Song & Zahedi (2005)
	Website Brand name	Ibeh, et al. (2005)

Effective website design plays a critical role in attracting new customers and retaining current customers. Van der Heijden and Verhagen (2004) demonstrate that online store image, which include Online Store usefulness, Online Store enjoyment, ease of use, Online Store Style, Enterprise Image, Financial Settlement Performance, Logistical Settlement Performance, will influence customers' attitude towards purchasing at online store and positively increase customers' purchase intention. From a different angle of view, Song, J and Zahedi (2005) emphasize five categories of website design: promotion, service, external interpersonal sources, ease of use and navigation, and purchase facilitation. These categories of Web-design elements reinforce Web customers' beliefs, which in turn positively impact attitudinal constructs that lead to changes in their purchase intentions.

Table 1 summarizes all the studies mentioned above.

ONLINE CONSUMER BEHAVIOR MODEL
Online consumer behavior models are introduced to understand and predict the wide range of decisions that consumers make based on the background of customer profile factors, online shop profile factors, and other intervening factors. Several different models were developed in last several years to help business deeply understand customer online behavior.

Li et al (1999) presents a conceptual model of factors affecting online purchase behavior. They believe that convenience, experiential, communication and distribution, and accessibility have positive relationship with online shopping behavior. In addition, three customer profiles, which include gender, income and education, have positive impact to both online shopping behavior and channel knowledge, which also positively affect online shopping behavior.

In a research of goal-directed online shopping behavior, Wolfinbarger and Gilly (2000) raise a model with five income factors, which are accessibility/convenience, selection, information availability, control of sociality, and commitment to goal, and two outcome dependent variables: freedom and control. They believe that customers are more likely to do online shopping if they have power of freedom and control during their virtual shopping.

Based on a general customer behavior model, Laudon and Traver (2001) describe a modified model to predict online consumer behavior. Culture, Social and psychological are three the background factors as independent demographic variables. Besides web site features as one intervening variable, brand, marketing communications stimuli, and firm capabilities are three intervening variables from market stimuli perspective. Clickstream behavior is another intervening variable based on Internet behavior. The dependent variable of this model is buyer decisions. With this model, authors believe that a more accurate prediction of customer online behavior can be reached than the general customer behavior model.

An abstract framework is proposed by Yin and Straub (2002) to examine the impacts of communications interactivity on online customer decision behaviors. Authors propose that, "interactivity can improve customer satisfaction and trust through perceptions of responsiveness and mutuality, which further increase customer intentions to buy."

With more detailed description, Li and Zhang (2002) demonstrate a research model of consumers' online shopping attitudes and behavior. The shopping process in this model is from antecedents through attitude towards online shopping, intention to shop online, decision making, to online purchasing. Consumer satisfaction is an intervening variable having two-way relationship with attitude, intention, decision making and online purchasing. Authors list five antecedents as the background factors of the model: external environment, demographics, personal characteristics, personal characteristics, vender/service/product characteristics, and website quality. The relationship between satisfaction, attitude, intention, decision making and online purchasing are proposed to be two-way relationships due to the reciprocal influences of each on the other. In addition, two of the antecedents, vendor/service/product characteristics and website quality are proposed directly affect to consumer satisfaction.

Beside all the constructs mentioned above from different researchers, clickstream behavior is another important construct. Clickstream behavior refers to the transaction log that consumers establish as they move about the web. Studying this variable can help online business understand what the consumer is looking for at each moment. Online business, therefore, can react immediately according to different customer's activities there as to gain more customers and make more benefit. Many researchers now believe that clickstream behavior of people online is one of the most important predictors of online customer behavior (Laudon & Traver 2001; Vriens & grigsby, 2001; Moe, 2003; Van den Poel & Buckinx, 2005). However, very few researches have been done in this area to predict customer online behavior. This study try to emphasize the importance of clickstream patterns about clickstream behavior to help business better understand customer online behavior.
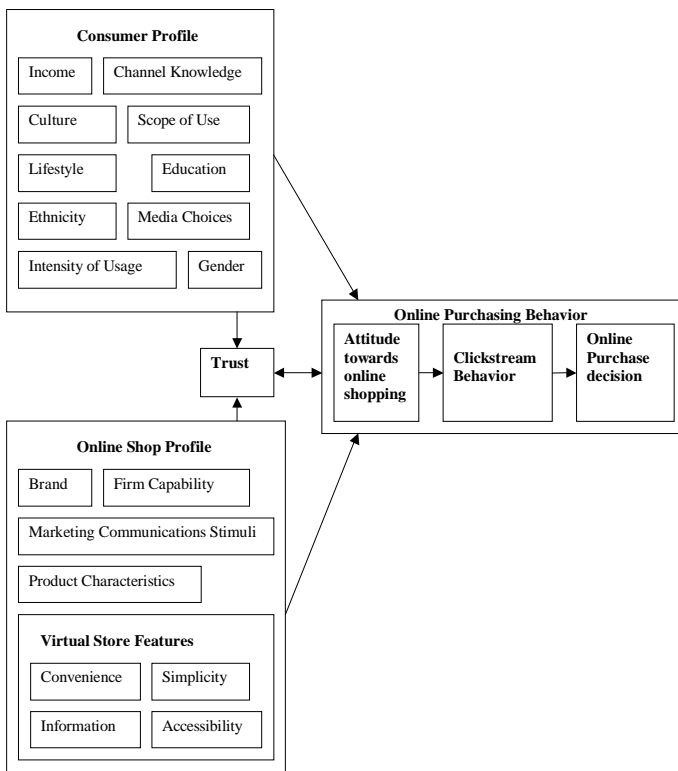
DEVELOPMENT OF A TENTATIVE MODEL FOR CUSTOMER ONLINE BEHAVIOR
According to literature review and existing online customer behavior models above, a revised model is proposed in Figure 1.

The following factors are hypothesized to influence customers' online purchasing behavior:

1. Customer Profile Information: customers' income, culture, lifestyle, gender, education level, ethnicity, media choices, channel knowledge, scope of use and intensity of Internet usage.
2. Online Shop Profile Information: the brand name of the shop, marketing communications stimuli, firm capability, product characteristics, and virtual store feathers, which including convenience, simplicity, information, accessibility.
3. In addition, based on the literature review, we propose that trust is another key constructs that will affect customers' intention to purchase online.

Figure 1.   Proposed model of online consumer behavior

Customer online purchasing behaviors, this study proposed a research model to explain Customer online purchasing behaviors based on consumer profile, online shop profile and trust. In this study, the construct of clickstream behavior is emphasized in the model to remind online retailers the importance of this construct related to Customer online purchasing behaviors.

REFERENCES

Bellman, S., Lohse, G., and Johnson, E. (1999), "Predictors of Online Buying Behavior," Communications of the ACM, Vol. 42, No. 12, pp. 32-38.

Brucks, M. (1985), "The Effects of Product Class Knowledge on Information Search Behavior," Journal of Consumer Research, Vol. 12, Issue 1, pp. 1-16.

Change, J. and Samuel, N. (2004), "Internet Shopper Demographics and Buying Behavior in Australia," The Journal of American Academy of Business. Vol. 5 Issue 1/2, pp. 171-176.

Chau, P., Cole, M., Massey, A., Montoya-Weiss, M. and O'Keefe, R. (2002), "Cultural Differences in the Online Behavior of Consumers," Communications of ACM, Vol. 45, No. 10, pp. 138-143.

Dholakia, U. and Bagozzi, R. (2001), Consumer Behavior in Digital Environments, in Wind, J. and Mahajan, V. (eds.): Digital Marketing, New York, Wiley, pp. 163-200.

Häubl, G. and Kyle M. (2001), "Recommending or Persuading? The Impact of a Shopping Agent's Algorithm on User Behavior," Proceedings of the ACM Conference on Electronic Commerce (EC'01), M. Wellman and Y. Shoham, eds., New York, NY: Association for Computing Machinery, 163-170.

Ho, C. and Wu, W. (1999), "Antecedents of consumer satisfaction on the Internet: an empirical study of online shopping," Proceedings of the 32nd Hawaii International Conference on System Sciences.

Hoffman, D., Novak, T., and Chatterjee, P. (1996), "Commercial Scenarios for the Web: Opportunities and Challenges," Journal of Computer-Mediated Communication, Vol. 1, Issue 3.

Hoque, A. and Lohse, G. (1999), "An Information Search Cost Perspective for Designing Interfaces for Electronic Commerce," Journal of Marketing Research, Vol. 36, pp. 387-394.

Ibeh, K., Ying, L. and Dinnie, K. (2005), "E-branding strategies of internet companies: Some preliminary insights from the UK," Journal of Brand Management, Vol. 12, Issue 5, pp.355-373.

Janiszewski, C. (1998), "The influence of display characteristics on visual exploratory search behavior," Journal of Consumer Research, Vol. 25, Issue 3, pp. 290-301.

Kim,D., Cho, B. and Rao, H. (2000), "Effects of Consumer Lifestyles on Purchasing Behavior on the Internet; Conceptual Framework and Empirical Validation," ICIS 2000, Brisbane, Australia, December 10-13, 2000.

Kim, S., Williams, R. and Lee, Y. (2003), "Attitude Toward Online Shopping and Retail Website Quality: A Comparison of US and Korean Consumers," Journal of International Consumer Marketing, Vol. 16 Issue 1, pp. 89-111.

Laudon, K. and Traver, C. (2001), E-commerce, Addison Wesley, New York.

Li, H., Kuo, C. and Russell, M. (1999), "The impact of perceived channel utilities, shopping orientations, and demographics on the consumer's online buying behavior," Journal of Computer Mediated Communication, Vol. 5, Issue 2.

Li, N. and Zhang, P. (2002), "Consumer Online Shopping Attitudes and Behavior: An Assessment of Research," Eighth Americas Conference on Information Systems.

Rainie, L. and Packel, D. "More Online, Doing More." The Pew Internet and American Life Project. Available online: http://www.pewinternet.org/reports/toc.asp?Report=30

Moe, W. (2003), "Buying, Searching, or Browsing: Differentiating Between Shoppers Using In-Store Navigational Clickstream," Journal of Consumer Psychology, Vol. 13, Issue 1&2, pp. 29-39.

The following factors are hypothesized to influence customers' trust:

1. Customer Profile Information: customers' income, culture, lifestyle, gender, education level, ethnicity Degree of mobility: we hypothesize that the more mobile the user, the more valuable mobile computing is to the user.
2. Online Shop Profile Information: the brand name of the shop, marketing communications stimuli, firm capability, product characteristics, and virtual store feathers, which including convenience, simplicity, information, accessibility.
3. Customer's online purchase behavior: the process from customer's attitude towards online shopping, to clickstream behavior, and finally making online purchasing decisions.

The following factors are hypothesized to influence customers' online purchasing decision:

1. Attitude towards online shopping: this is the initial step of customers' online purchasing.
2. Clickstream behavior: click patterns and sequence of customers activities during online shopping.

PROPOSED STUDY

The model developed will first be verified and enhanced through interviews with users online shopping. Once the model is finalized, the survey methodology will be employed to test the model. Experimental studies will also be planned to gain a more in-depth understanding of issues in human-computer interface of mobile devices.

CONCLUSION

Customer online purchasing behaviors are subtlety different in nature from traditional consumer behavior due to its unique business style (Chau, et al. 2002). To help online retailers deeply understanding

Moe, Wendy W., Hugh Chipman, Edward I. George, and Robert E. McCulloch, "A Bayesian Treed Model of Online Purchasing Behavior Using In-Store Navigational Clickstream," *revising for 2nd review at Journal of Marketing Research*

Rodgers, S. and Harris, M. (2003), "Gender and E-Commerce: An exploratory Study," Journal of Advertising Research, Vol. 43, Issue 3, pp. 322-329.

Shim, J., Shin, Y. and Nottingham, L. (2002), "Retailer Web Site Influence on Customer Shopping: An exploratory Study on Key Factors of Customer Satisfaction," Journal of the Association for Information Systems, Vol. 3, pp. 53-76.

Slyke, C., Comunale, C. and Belanger, F. (2002), "Gender differences in perceptions of web-based shopping," Communications of the ACM, Vol. 45, No. 7, pp. 82-86.

Song, J and Zahedi, F. (2005), "A Theoretical Approach to Web Design in E-Commerce: A Belief Reinforcement Model," Management Science, Vol. 51, Issue 8, pp. 1219-1235.

Van den Poel, D and Buckinx, W. (2005), "Predicting online-purchasing behavior," European Journal of Operational Research, Vol. 166, Issue 2, pp. 557-575.

Van der Heijden, H. and Verhagen, T. (2004), "Online store image: conceptual foundations and empirical measurement," Information & Management, Vol. 41, Issue 5, pp. 609-618.

Wolfinbarger, M. and M. Gilly (2000), "Consumer Motivations for Online Shopping," Proceedings of the Americas Conference on Information Systems, Long Beach, August.   pp. 1362-1366.

Yin, J. and Straub, D. (2002), "The Interactivity of Internet-based Communications: Impacts on E-Business Consumer Decisions," Twenty-third International Conference on Information Systems.

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