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序號：

姓　名	郭輝明	會議期間	92.08.24 - 92.08.29
會議名稱	中文：第十五屆國際人因工程研討會		
	英文：The XV Triennial Congress of the International Ergonomics Association (IEA 2003 Congress)		
受補助項目	機票費：NT $15300　　生活費：17029 註冊費：6850　合計總金額：NT $39179		
出國報告：	IEA 2003 為一國際級之人因工程研討會，此一會議每三年舉行一次，是國際上最大規模、涵蓋最完整的學術研討會，也是國際人因工程界三年一度的盛事。第十五屆國際人因工程學會聯合會(IEA)大會暨研討會今年於韓國漢城舉行,會議涵蓋諸多領域，如 Aging and disabilities、Agriculture、Ergonomics in manufacturing、Cognitive Ergonomics、HCI、E-business & web applications、Health、Safety、HCI & Usability、Human reliability 等等。參與本會議之人士包含世界各國之研究人員與學者，發表超過1,200 篇以上之研究論文。 本次會議本人所發表之論文爲”Verification of a B2C		

	Consumer Behavior Model in Electronic Commerce”，在 HCI 中的 E-business and web applications section 中發表。從發表及發表後的問答中，讓我對自己所做之研究有更深入之瞭解，也得到一些啓示，尤其對如何將人機介面之理論運用於產品開發設計或日常生活中有更多之體會。此外，藉由聆聽他人之論文發表與相關學者之演講，除可增加本人之國際觀外，也讓我對人因工程之發展與未來的研究有更爲寬廣之方向。我相信此行之收穫是相當大的。
發表論文 全　文：	參閱下頁 附錄

受補助之學生請於回國後將此表填妥mail至mailto:eclue@mx.nthu.edu.tw信箱

附錄：

VERIFICATION OF A B2C CONSUMER BEHAVIOR MODEL IN ELECTRONIC COMMERCE

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The purpose of this study is to verify a proposed consumer behavior model that is constructed earlier for business-to-consumer (B2C) electronic transactions by on-line observation. Twelve voluntary subjects participated in this study. Subjects were asked to perform online shopping tasks in an experimental environment and the processes were videotaped for analysis. The tasks were to buy two types of products, a book and a notebook PC. The results indicated that the B2C consumer behavior in electronic commerce (EC) could be described completely by the proposed Ten-Step Model. The complexity of the behavior model and time spent in each step depend on the characteristics of the products. It is suggested that websites information and the customer-supporting interfaces should be provided in corresponding to the specific types of products and the factors that affect consumer behavior to best assist customers in EC.

Keywords: Consumer behavioral model, B2C, Human-computer interaction

INTRODUCTION

In commercial applications on the Internet, e-shopping has become a new way of purchasing for customers. Owing to the convenience of the Internet, it is perceived that the market of EC attracts much attention in both local and international businesses. A recent report for e-shopping conducted by Iamasia Co. (Digitimes, 2001/10/15) indicated that 49% of Internet users in Taiwan had experienced e-shopping. It also reported that for those e-consumers, the average yearly e-consumption frequency was 4.6 per person, and they used Internet bank up to 5.8 times per year. Similarly, Forrester Research Inc. reported that the average personal e-consumption frequency increased from 4.3 up to 7.4 per person in one year (Helander, 2000).

Since the emergence of the Internet, there has been a rapid growth in B2C transaction due to the convenience of the Internet and the relatively lower initial costs. However, many consumers haven't yet tried shopping on the web, which may be caused by the very different and complicated B2C processes and the inappropriate user interface designs that confusing, frustrating and discouraging them. According to Digitimes (Digitimes, 2001/11/14), a report by Vividence Co. pointed out that 75% of e-consumers abandoned e-shopping before completing payment partly because they considered the purchasing process on the Internet is too complicated. E-Buyers Guide (1999) reported that the Internet consumers were increasing rapidly but they did not enjoy e-shopping mainly because the interactions between consumers and the virtual stores were unsatisfied. Therefore, in order to build a better B2C environment to facilitate the commercial transactions, it is necessary to understand that the differences between the virtual store consumer behavior and that of physical store customers.

From existing literatures, some traditional purchasing models were used in explaining consumer behaviors deal with shopping on the Internet. O'Keefe & McEachern (1998) used

traditional consumer behavior model to explain e-shopping behaviors. Their model contains five decision processes: need recognition, information search, evaluation, purchase, and after purchase evaluation. They emphasized that EC systems need to be designed to support these processes. Liang and Huang (1998) developed an electronic market transaction cost model with seven costs involved. As implied by the costs, the transaction processes, i.e., search, comparison, examination, negotiation, payment, delivery, and post-service, are evident. Miles, Howes and Davies (2000) argued that three purchasing activities, search for products, management of search criteria, and comparison of found products, are important in e-shopping. These activities also represent a simple e-consumer behavior model.

Shopping on the Internet is a series of complex decision-making process. The behavior model is important for EC in determining how a B2C web site can effectively attract and retain customers. The purpose of this study was to verify a proposed B2C electronic transaction consumer behavior model constructed earlier by on-line observation. With this study, it is expected to develop a complete and detailed consumer behavior model for B2C electronic transactions.

PRELIMINARY B2C CONSUMER BEHAVIOR MODEL

A preliminary B2C consumer behavior model (Kuo, Hwang, Wang, 2002) was initiated by brainstorming and structured interview with 78 subjects. The model contains ten steps as shown in the solid squares in Figure 1.

A consumer's motivation for e-shopping may be initiated by the need for a specific product or even by "innocent browsing". When browsing on the web, consumers typically go to web sites or search engines with which they are already familiar. After finding the appropriate web site, they will browse the web site, search, examine,, evaluate, and compare products. If consumers encounter difficulties, such as a lack of suitable products, or poorly designed web page interfaces, they leave the original web site. The consumers will probably search for another web site and continue the shopping processes until they find the required products. Once a suitable product within budget is selected, consumers will put it into the shopping cart. This step is called "temporary purchase". The consumer can return to shopping and choose another product or proceed to the next step. The payment comes after the purchase is ended. Once the consumer chooses a payment method and delivery site, then all procedures involving Internet interaction will be completed. The next steps are to wait for the products and check before acceptance. However, the consumers may leave the shopping site only because of complicated payment procedures, or membership limitations regardless the efforts already paid. At that point, some consumers may re-choose another web site for shopping, but others may give up.

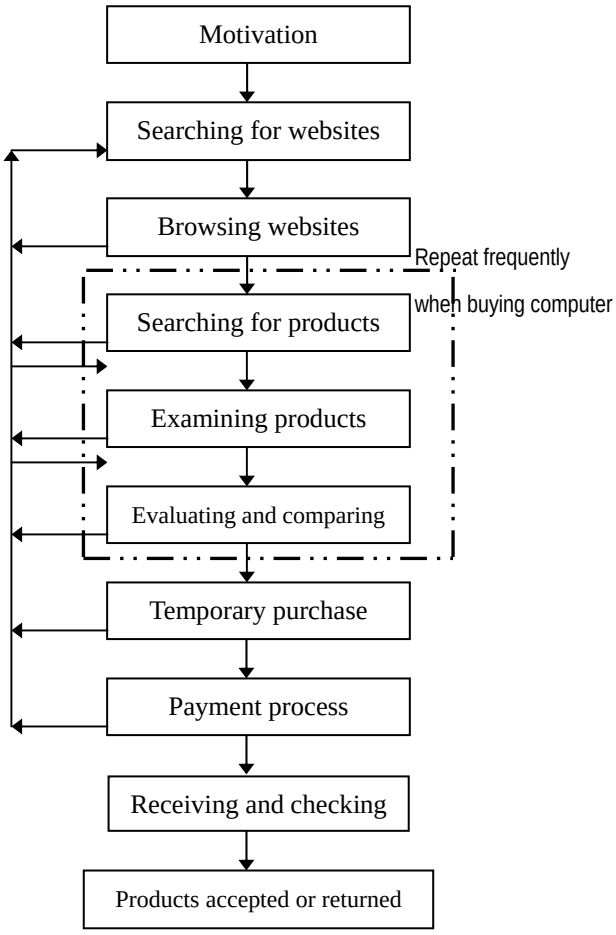

Figure 1. Preliminary B2C consumer behavior model

It was found that the complexity of the behavior model dependent on the characteristics of the products. It was

simpler and quicker in the stages of examining, evaluating and comparing the products when purchasing books. While purchasing expensive items, e.g., computers, consumers were repeating the steps of searching, evaluating, and comparing products, They tried using multiple search engines to evaluate and compare products, until they found the satisfied one.

METHODOLOGY

The above model was verified by on-line observation experiment. Twelve voluntary subjects participated in this study. Six subjects are male and six are female. Subjects were asked to perform online shopping in an experimental environment and their behaviors were videotaped for further analysis. A book and a notebook PC were the products to buy in the experiment. Besides the given author and title of the book, and the budget and basic specifications of the notebook PC, the brand and the features of the latter were unspecified.

Each subject's general information, e.g., gender, age, e-shopping experience, etc., was collected prior to the experiment. Think aloud protocol technique was used during the experiment. Subjects were required to speak out loudly about what he was thinking or the reason behind his decision while buying the products on the Internet. At the beginning of the experiment, subjects had a short practice to familiarize with the think aloud protocol and the experiment process. The experiment was videotaped and carefully analyzed with "The Observer" software as shown in Figure 2. The results will be feedback to revise the preliminary B2C consumer behavior model.

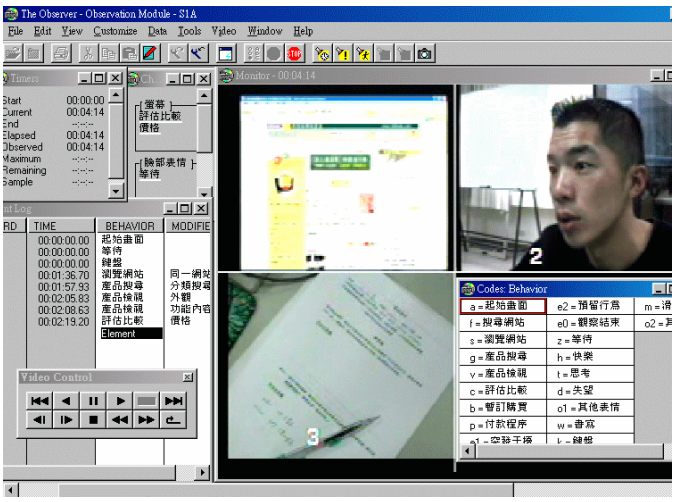

Figure 2. The experiment and behavior analysis software

RESULTS

Except a long experiment record of one beginner subject was unable to process, those of the others (11 subjects) were analyzed. Their behavior patterns evidently showed that the Ten-Step Model does portray the B2C consumer behavior in question. It was also found that the time spent in each step of the model differs from one product to another. Because notebook PCs have more choices, more complex, and are more expensive than books, subjects spent longer time on examining, evaluating, and comparing the candidates before "temporary purchase". Interestingly, subjects visited more websites (in average, 5.2), thus spent more time on searching for suitable websites (see Table 1), when buying books than buying notebook PCs (in average 1.5 websites).

Table 1. Percentage of time spent in each e-shopping step

Steps \ Products	Book	Notebook PC
Searching for websites	21.2	3.9
Browsing websites	9.7	2.0
Searching for products	12.0	12.8
Examining products	10.7	32.9
Evaluating and comparing	1.7	20.5
Temporary purchase	3.1	2.4
Payment process	41.5	25.6

The subjects repeated frequently on specific steps and formed a loop in the B2C consumer behavior model in order to buy a suitable product with good price. As shown in Table 1 and Figure 3, for the two products, the repeated steps are those that took more time and formed different behavior patterns according to the percentage of time spent in each step. This lead to a revised B2C consumer behavior model (Figure 3).

DISCUSSIONS & CONCLUSIONS

From the above results, it can be concluded and discussed as followings:

1. The Ten-Step Model may describe correctly the B2C consumer behavior for EC.
2. The payment process was too complicated. The subjects spent quite much time (25.6% connection time for notebook

PCs and 41.5% for books) in this step and complained about cumbersome membership registration or form filling.

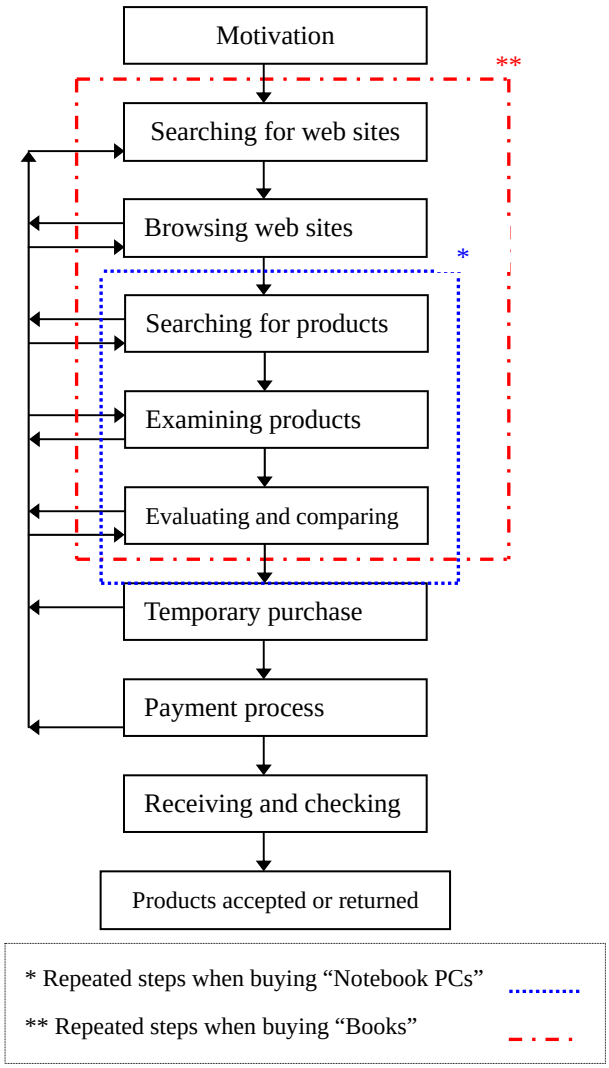

Figure 3. Revised B2C consumer behavior

3. The time spent in each step and the repeating patterns of the steps in buying a specific product are different from buying another. In other words, consumers need different information and assistance when buying different products. In this study, it is found that when buying notebook PCs or complex products, customers may need a powerful information processing organism with suitable interface designed for presenting helpful information in examining, evaluating and comparing the interested products.

It is suggested that by understanding B2C consumer behavior model in EC, a more usable consumer interface design shall provide more effective, and satisfactory EC environment to the consumers. Better B2C marketing strategy shall also be benefit from the model if the consumer behavior to a specific type of product on EC were understood.

ACKNOWLEDGEMENT

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