Effect of Personalization on the Perceived Usefulness of Online Customer Services: A Dual-Core Theory

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ABSTRACT

E-tailers provide a variety of customer service, many of which are personalized in an attempt to improve customer satisfaction. Several studies indicate that customers perceive these services to be useful, but it is inconclusive whether this effect is created by economic or emotional factors. This paper proposes a dual core theory that takes into account both economic factors (measured by perceived reduction in transaction costs) and emotional factors (referred to as the perceived care) in their effect on the perceived usefulness of providing personalized customer services.

A survey revealed that different customer services have different perceived usefulness. The study also found that both economic and emotional factors come into play; the perceived care has a stronger effect than transaction cost reduction on the perceived usefulness of e-services. This implies that the effect of personalized services is due to both economic and emotional factors, (called dual-core), and that e-tailers may use personalized customer services strategically to increase customer care, rather than just focusing on providing economic benefits.

Categories and Subject Descriptors

K.4.4 [Electronic Commerce]: Distributed Commercial Transactions.

General Terms

Management, Theory, Human Factors

Keywords

Customer Services, Service Science, Personalization, Transaction Cost, Perceived Customer Care, Perceived Usefulness of Services

1. INTRODUCTION

Recent growth of online business has created a substantial amount of innovative services to overcome the intense online competition. These services have been found to be very useful in increasing customer satisfaction and have become a key component in making an online business successful (e.g., Singh, 2002; Levenburg and Klein, 2006). Sample services, such as video recommendations, can be seen at Netflix video rental and the one-click check out service at Amazon.com.

The importance of personalized services is evidenced by the recent development of service science, management and engineering (SSME) proposed by IBM and other major vendors. A primary goal of service science is to develop solid theories and best practices in order to take advantage of information technology (IT) for improving service processes and enhancing service effectiveness. A major feature that IT can contribute toward better service is analyzing customer preference and tailoring the service process and content to the customers’ needs. These individually tailored services (e.g., recommending relevant books to individual customers) are called personalized, as opposed to those generic services (e.g., sending Christmas discount coupons to all customers), which is called non-personalized.

Recent empirical evidence indicates that about 80% of Internet users are interested in personalized services (Kobsa, 2007). According to Freedman (2007, p. 2), 56% of frequent online shoppers were more likely to make a purchase on a website that offered personalization features, than on website that do not offer them. Previous research indicates that different personalized services tend to have different effects on customer satisfaction (e.g., Alpert et al., 2003), but not much research has been done on which factors contribute to the effect of personalization in customer service and why personalization of certain services are perceived to be more useful than others.

Personalized service is an interactive process in which a vendor provides relevant customized content based on clients’ preferences (Miceli et al., 2007). Probably the most well-known industry sector that uses online customer service features is online retailers (or called e-tailers), especially Amazon.com. Online retailers can choose from about 20 different services (including those for mobile users) and innovative ideas that result in new services. Thus, deciding the appropriate offering of services and assessing their effects become an important managerial problem. Competition forces e-tailers to provide more services, and in many cases the vendors are competing on service features rather than on price (Walsh and Godfrey, 2000).

Personalization of online services (also called e-personalization) has several patterns. An example would be offering tailored information (e.g., content, messaging, and navigation) to fulfill the needs and desires of customers based on an analysis of the customers’ profiles. Personalized services are not limited to the Web. Every customer-oriented information system that deals
with a large amount of data and/or has a heterogeneous group of users (e.g., e-kiosks, e-learning environments) needs to consider personalization.

Previous research has also found that personalization technologies are powerful means to handle information overload (Liang, Lai, and Ku, 2006), to make web sites more usable to users (e.g., better user satisfaction), and to help online businesses establish personal relations with their customers (one-to-one marketing and CRM). Vendors are also using personalization to match advertisement and promotions with customers' individual needs and preferences in what is known as targeted or behavioral advertisement.

The purpose of this study was to explore whether different personalized services would result in different effects on users' perceived usefulness. Online bookstores were chosen as the research domain due to their success recently. More specifically, this research focused on the following research issues:

1. What customer services are perceived to be more useful to the customer in e-tailers?

2. Whether the difference in perceived usefulness of customer services is mostly due to economic or emotional factors?

Answers to these questions can help understand the nature of customer response to personalization and guide e-tailers in designing an appropriate portfolio of customer services. A theoretical framework that includes both economic and emotional paths is proposed, and an empirical study was conducted to evaluate the theory. The remainder of the paper is organized as follows: Section 2 reviews theories related to personalized services and their perceived usefulness, and presents our research framework. Section 3 describes the research design. Section 4 reports the results of the empirical study. Based on these, we provide a conclusion and suggest future research directions in Section 5.

2. THEORETICAL FOUNDATION AND THE RESEARCH FRAMEWORK

2.1 Personalization in Service Systems

A service is a time-perishable, intangible experience performed for a customer acting in the role of co-producer. It is an interactive process for the co-creation of value (Fitzsimmons and Fitzsimmons, 2008). The delivery of services requires a service system that is an integration of related components necessary for delivering high quality services. Personalization has been found to have a positive effect on customer satisfaction a long time ago (e.g., Mittal and Lassar, 1996), and it is a major component of many IT-based service systems.

Figure 1 shows a conceptual diagram that illustrates the relationship among major components in a service system. At the top are the customers’ needs that can be satisfied by product customization and service personalization. Business process models that integrate organizational and information systems are the kernel to support product and service delivery. The foundation of a sound service system is a service-oriented technology platform that supports dynamic and on-demand business processes.

2.2 Perceived Usefulness of Customer Services

Several constructs have been used to measure the effect of adopting information technologies by end users. A popular one is user satisfaction, which is usually suitable as an ex post measurement to understand users’ response to using a technology or a product. Information system quality is another ex post measure that is often decomposed into three elements: information quality, system quality, and service quality. A problem with these measures is that the target system for measurement needs to be the same for all respondents. For example, a user who is satisfied with SAP’s ERP system may not be satisfied with Oracle’s ERP system. Hence, aggregating user satisfaction data from different firms (likely having different designs of information systems) for analysis has inherent flaws.

Alternatively, information systems researchers also attempted to study users’ intentions to adopting technology without actually knowing whether the user has used a particular system previously. Perceived usefulness has been developed as an important construct in the technology acceptance model (TAM) (Davis, 1989), and it has been used in many previous studies as an effective measurement of the value of IT-based services (Davis, 1989; Yang and Padmanabhan, 2005; Massey et al., 2007; Henderson and Divett, 2003). For example, previous literature has reported that perceived usefulness may increase customers’ loyalty, adoption of recommendation provided by intelligent agents (Komiak and Benbasat, 2006), and intention to buy (Tam and Ho, 2006; Brusilovsky, Kobsa, and Nedji, 2007; Smith, 2005). In fact, perceived usefulness has become a key predictor of users’ attitudes and intentions to use a technology.

Therefore, it is reasonable to use perceived usefulness as a surrogate variable to measure the value of online customer services. The perceived usefulness is also correlated with the concept of perceived value, a construct that has been extensively researched in marketing research as shown by Chen and Dubinsky (2003). A comprehensive survey about perceived usefulness is available at Sanchez-Fernandez and IniestaBonillo, 2007.

2.3 Transaction Cost Theory

In order to use personalization effectively for better customer services, we need to have sound theories that can explain the effect of personalization. A major line of thinking is that personalization can reduce the effort (e.g., reducing information overload) for customers who receive the service. For example, a book recommendation service can reduce the effort of finding a particular book. In previous research, Liang, et al. (2006) investigated the use of a personalized content provision in news websites, and found that the increase in user satisfaction from such a service was primarily due to effort reduction. The more accurate
the recommendation items, the higher the user satisfaction. This finding indicates an economic view on the effect of personalization.

A more comprehensive theory of effort reduction is the transaction cost economies. Transaction cost reasoning became most widely known through Williamson’s *Transaction Cost Economics* (1985). According to Williamson, the determinants of transaction costs are transaction frequency, asset specificity, uncertainty, limited rationality, and opportunistic behavior, all of which may be present in online trading. Today, transaction cost economics is used to explain a number of different behaviors, including online satisfaction.

From a rational perspective, it makes sense that the usefulness of customer services is derived from its ability to reduce the effort, time, and costs involved in the transactional process. Transaction costs refer to “a cost incurred in making an economic exchange, during the buying and selling transactions, other than the purchase cost of the product or service” (Dahlman, 1979). Transaction costs can be tangible and intangible, and may be monetary, cognitive, or labor efforts. These costs are paid directly or indirectly by the consumers, and therefore, it is logical to assume that consumers tend to choose an option that exhibits a minimal level of transaction costs (e.g., see Liang and Huang, 1998).

Previous research has shown that usually the Internet and e-commerce can lower the transaction costs involved in the commercial trading process occurring in the marketplace (Malone et al., 1987; Cordella, 2006). For example, by using search and comparison engines, the cost of locating buyers and/or sellers and discovering product information is lower than in the physical marketplace. The relevant administrative costs can also be lower. The information overload resulting from a large amount of clues that supports decision-making and communication online can also be reduced (Liang et al., 2006). Other transaction costs, such as online ordering, safeguarding (e.g. data encryption), and delivery costs (e.g. e-logistics service) can also be lowered through adoption of various information technologies.

### 2.4 Perceived Care Theory

In addition to effort reduction, personalized services may also generate stronger emotional links between service vendors and customers. These types of factors are the consumers’ affective feeling of a service (in short, affect). Consumer affect is a type of mental response to stimuli and events. Existing literature has shown that affect induced from a stimuli or event is a major factor that determines consumer behavior (e.g., see Xia, 2002 and Grudney, 2006). For example, Jun et al., (2008) studied affect from marketing and psychology perspectives. Saari et al., (2004) described a framework for a personalization system to systematically induce desired emotion and related attention, and promote information processing in viewers of online advertisement and e-commerce product information. They called this “psychologically targeted persuasive advertisement.” Komiat and Benbasat (2006) also reported that both emotional and cognitive trusts have roles in the process of adopting recommendation agents.

These findings support another theory that the effect of personalized customer services on their perceived usefulness may be due to consumer affect and the positive feeling which is sometimes referred to as perceived care. As defined by Bevis (1989), “caring is a feeling of dedication to another to the extent that it motivates and energizes action to influence life constructively and positively; most other human feelings have potentially negative effects as well as positive ones, but caring by its nature and definition is only and always positive.” Consumers will build a positive attitude when they feel the vendor cares for them and pays attention to their personal needs through the provision of customer services.

## 2.5 A Dual-Core Research Model and Hypotheses

As argued by Simon’s bounded rationality theory, human decisions are neither totally economically rational nor purely emotional. Instead, they are the result of a mixture of rational and emotional factors. Hence, dual-process theories are popular in social psychology. For instance, the Elaboration Likelihood Model (ELM) is popular in explaining the human persuasion behavior. The model integrates a central route (cognitive and high elaboration) and a peripheral route (intuition and low elaboration).

Dual process models have also been applied to online research before. For instance, Komiat and Benbasat (2006) reported that recommendation agents can give rise to an individual’s emotional process. Both emotional and cognitive trusts have roles in the adoption of such recommendation agents. Tam and Ho (2006) applied the ELM to study the persuasion effect of recommendation messages. A typical dual process model includes a rational path that needs systematic reasoning and an emotional path that relies on judgment and intuition. The ELM approach calls them central and peripheral routes, while the heuristic-systematic model by Chaiken (1980) calls them systematic and heuristic processing, respectively.

As described in sections 2.3 and 2.4, transaction costs and perceived care are appropriate measures of economic and emotional factors. Reduced transaction costs and increased perceived care may explain why users value customer and personalized services as useful. Therefore, we propose a research model that includes these two theories as mediators between customer services and their perceived usefulness. Transaction cost theory shows the rational and economic concerns, while perceived care is behavioral and affective oriented (Lin and Lu, 2000). Figure 2 shows the suggested relationships among these two constructs. Provisions of customer services, some of which are personalized, assume to effect transaction costs and perceived care of customers, which in turn affects the perceived usefulness of the provided services. The figure also shows five specific hypotheses tested in our study. They are presented below.

![Figure 2. Theoretical Framework of the Research](image)
**H1: Personalized customer services have higher levels of perceived usefulness than non-personalized ones.**

This hypothesis is aimed mainly to verify and complement previous research. For example, Alpert et al. (2003) found that people engaged in different types of transactions value the usefulness of various personalized services differently. Huang and Lin (2005) explored why certain personalization services were embraced by customers while others were not. Finally, Kobsa (2007) reported that different personalization services provided different potential benefits. We tested this hypothesis in order to verify whether our survey on personalized services provides consistent findings in order to ensure the validity of further theoretical analysis. We also examined differences among the various services to see which personalized services have higher levels of perceived usefulness.

**H2: Different customer services are perceived to have different effects on transaction costs.**

Previous research has concluded that customer services may reduce transaction costs, but whether the effects are the same for different personalized services has not been previously confirmed. This hypothesis examines which ones have the stronger effect, and whether rational reasons exist that make personalized services perceived more useful by customers than non-personalized ones. A sub-hypothesis here is that personalized services will have a stronger effect than non-personalized ones.

**H3: Different customer services are perceived to have different effects on perceived customer care.**

The purpose of this hypothesis is to test the emotional effect of various customer services. For example, Alpert et al. (2003) indicated that perceived personal care levels may be different for different personalized services. This hypothesis attempts to find whether the observation of Alpert et al. is repeatable, and which of the personalized services have the highest effects. We also examined the sub-hypothesis that personalized services will have a stronger effect than non-personalized ones.

**H4: The perceived usefulness of different customer services is determined by their effect on reducing transaction costs.**

As described in Section 2.2, transaction cost reduction is logically attractive to customers, e.g., reduced search efforts and reducing risks by conducting price comparisons (e.g. Rindfleish and Heide, 1997). This hypothesis intends to examine if there are positive effects between the reduction in transaction costs and perceived usefulness of different customer services, and whether personalized services exhibit a higher effect than non-personalized ones.

**H5: The Perceived usefulness of different customer services is determined by their effect on perceived levels of personal care.**

As predicted by the perceived care theory, the perceived usefulness of a customer service is affected by the perceived care of the customer services. We also examine whether personalized services have a higher effect than non-personalized ones.

### 3.1 Selection of Customer Services

Many different types of customer services are available in online bookstores. A panel of three experts was invited to survey six popular online bookstores, including Amazon.com, books.com.tw, and B&N.com to identify the online customer services available at those stores. The following services were found to be common:

- **Book recommendation:** Providing relevant book recommendations to customers based on their previous shopping history. This function is also referred to as “recommendation agents” in some previous studies, see Xiao and Benbasat (2007) and Komiak and Benbasat (2006).
- **Book reviews:** Most bookstores provide review comments on books from other readers (e.g., Amazon allows customers to review and rank books they purchased). For a study on the effect of consumer reviews on consumer purchasing intention, see Park et al., 2007.
- **Orders processing, reporting and tracking:** This function allows customers to know the order status in the whole process of processing and delivery.
- **One-to-one after-sale services:** Tailoring services provided after the customer has purchased a product (e.g., providing troubleshooting advice or allowing for product return or repair)
- **Simplified payment (1-Click):** Allowing customers to order books repeatedly without re-entering payment and delivery information.
- **E-coupons:** Providing discounts on certain items, on any one item, or on all items.
- **E-news:** Providing information about new book releases and other book-related events to all customers.
- **Sending reminders for not visiting the store over a certain time period.**
- **Greeting visitors** by name when they enter the online store.
- **Selective content:** Providing contents only in areas in which the customer had shown interest.
- **Experience sharing:** Providing customers with experiences and opinions of other customers regarding the topics of interest to them.
- **Tool kits:** Providing calculators, scenario-specific information and other specialized purchasing aiding tools.
- **Customized website features:** Allowing customers to change website appearance, such as background color or functional layouts.

There are other customer services, such as personalized search tools where results are shown based on users’ previous shopping history, price comparisons, and book marking. They are available from Google (Sullivan, 2007) and other websites. Among many available services, we decided to choose those services as they are more related to the study and whether they are personalized or not. To determine if a customer service is personalized or not, we used three criteria proposed by Gaitonde (2008):

1. Whether the service needs to collect the user’s personal information?
(2) Whether the service delivery requires using the user’s preferences? (e.g., analyzing their previous shopping history)?

(3) Whether the content is tailored to different customers?

If two or more answers to the three questions regarding a specific service are “yes” we consider the service as personalized. Otherwise we considered it as non-personalized.

Two experts in electronic commerce (each with 20 years of experience) were invited to jointly select seven most representative services from the list. The experts also decided which of the 7 are personalized, based on the above three criteria. The results are shown in Table 1.

<table>
<thead>
<tr>
<th>Customer Service</th>
<th>Collect personal information</th>
<th>Use preferential preference</th>
<th>Provide tailored information</th>
<th>Personalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order processing/reporting</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>One-to-one after-sales service</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Email support</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>e-Catalogue</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Recommendation service</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>e-News</td>
<td>H</td>
<td>N</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>1-Click service</td>
<td>Y</td>
<td>Y</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

### 3.2 The Constructs and Their Operationalization

In addition to the differentiation between personalized and non-personalized services, we needed to collect data for the three constructs in our research framework. Their operationalization in the questionnaire is as follows:

1. **Transaction costs**: As transaction costs involve both tangible money and intangible cognitive effort, we measure them from three aspects: time saving, money saving, and user autonomy. Three questions were designed to evaluate the perceived level of transaction costs, as shown in Appendix A.

2. **Perceived care**: It is the feeling that the customer’s needs are fulfilled and it was measured by two questions: whether the customers feel (a) that they are treated as valuable, and (b) that their needs are cared for. Two questions are included in the questionnaire.

3. **Perceived usefulness**: The value of customer services is measured by its perceived usefulness. Three questions derived from Davis et al. (1989) were developed to assess whether the customer feels the services can help find useful information, reduce the uncertainty and increase pleasure in the process. Hence, three questions were included in the questionnaire.

Based on the above operationalization, we designed 8 questions for each service to test our hypotheses. A total of 56 questions for 7 services were included in the survey questionnaire. The questionnaire was pre-tested in a pilot study (see section 3.3) and then distributed to all subjects. Sample questions for the service of “book matcher” and “mood finder” are shown in Appendix A.

### 3.3 Research Instrument and Subjects

The questionnaire included three parts: the first part was designed to keep evaluating the experiences of the respondents, since we wanted to exclude non-experienced participants. The second part was designed to list opinions about customer service (the 56 questions), and the last part was designed to collect personal data. A five-point Likert-scale was used for the responses. The questionnaire was encoded in Microsoft’s FrontPage, posted online, and was linked to an Access database via ASP. As the questionnaire covers 7 customer services, the sequence of presenting the selected services to the subjects was randomized to prevent potential bias due to the presenting order of one service at a time.

A pilot test of the questionnaire was conducted using 20 subjects who had experiences in ordering from online bookstores, and three professors who had experiences in the B2C field and had done research on related topics. The formal survey was based on convenience sampling. The modified questionnaire was posted on eetimes.org.tw, a popular EC website in Taiwan with more than 20,000 registered members. Messages were also posted at several Taiwanese online social communities to invite volunteers to participate in the survey. In order to attract more subjects to participate in the survey, we gave participants bookstore discount coupons, and we also offered them a chance to win monetary rewards. The data collection activity lasted for 20 days.

A total of 389 responses were received, and 387 of them were complete for further analysis (224 males and 163 females). About 30% of the respondents were between 19 and 30 years of age. Around 40% of the respondents were older than 30. This age distribution indicates that many participants were non-students (most full-time college students in Taiwan are younger than 23). Most of the respondents visited online bookstores regularly. Sixty-six percent of the respondents reported that they visited e-bookstores at least 1 to 2 times a month. Data analysis and findings of our survey are reported in Section 4.

### 4. DATA ANALYSIS AND RESEARCH RESULTS

#### 4.1 Data Reliability

The reliability of the collected data was examined by the Cronbach’s α values. Except for the category of transaction cost being 0.7, all categories were above 0.7, up to 0.9336. As recommended by Cuieford (1965), a data set is considered reliable when its Cronbach’s α value is greater than 0.7. This indicates that the data collected in this study are reliable and can be used for further statistical analysis.

#### 4.2 Effect of Customer Services on Perceived Usefulness

The first issue we examined was whether personalized customer services result in higher perceived usefulness (H1). One-way ANOVA is used to compare the mean perceived usefulness reported by the participants. As shown in Table 2, the customer service of order processing/reporting (a personalized service) scored the highest (3.96 on the scale of 5), while the 1-Click service scored the lowest, (3.56). These results were found to be statistically significant (F= 18,740, p<.001). Therefore, hypothesis H1 is supported. Namely, our results show that different customer services have different levels of perceived usefulness. A t-test on the means of the different services revealed that personalized services, as a group, scored significantly higher than non-personalized services (t=4.61, p<.001). Thus, hypothesis H1 is supported.

The result from the Schef f e’s pairwise multiple comparisons (post
hoc test) is shown in Table 3. The test indicated that the means for order processing (3.96) and for one-to-one after sale service (3.88) (both personalized services) are significantly larger than the means for e-coupons (3.67), recommendation service (3.62), and 1-click (3.56), two of them are non-personalized. Although the difference in the mean values is not substantially large, the statistical test does show significant differences pointing to a need for further examination of our research model.

Table 2. Statistics of the Perceived Usefulness of Various Customer Services

<table>
<thead>
<tr>
<th>Customer Services</th>
<th>Type*</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>F Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order processing/reporting</td>
<td>F</td>
<td>3.96</td>
<td>0.70</td>
<td>11.740</td>
<td>0.001***</td>
</tr>
<tr>
<td>One-to-one after-sales service</td>
<td>F</td>
<td>3.88</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book review</td>
<td>NP</td>
<td>3.83</td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Coupons</td>
<td>NP</td>
<td>3.84</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation</td>
<td>F</td>
<td>3.62</td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-News</td>
<td>NP</td>
<td>3.59</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Click service</td>
<td>NP</td>
<td>3.56</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***P<0.001
*P=personalized; NP=not personalized

4.3 Effect of Customer Services on Transaction Costs

The second issue examined was the possible impact of different customer services on the perceived transaction costs. As shown in Table 4, one-way ANOVA compared the means of the perceived benefits in reducing transaction costs as resulted from different customer services. These results were found to be statistically significant (F= 7.777, p<0.001). That is, hypothesis H2 is supported. This indicates that different customer services effect transaction costs differently. Services that supports order processing and reporting (a personalized service) resulted in the highest reduction in transaction costs (mean=3.93), while providing e-news generated the least reduction in transaction costs (mean= 3.64).

A t-test revealed that personalized services as a group scored significantly higher than non-personalized services (t=3.37, p<0.01). Thus, hypothesis H2 is supported. By further looking into Scheffe’s multiple comparisons, as shown in Table 4, the impact on transaction cost reduction can be seen in two extremes: order processing and one-to-one after-sales services (both personalized) are significantly higher than the rest.

Table 4. Transaction cost reduction derived from Different Customer Services

<table>
<thead>
<tr>
<th>Customer Service</th>
<th>Mean of Transaction Cost Reduction</th>
<th>Type*</th>
<th>Standard Deviation</th>
<th>F Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order processing/reporting</td>
<td>3.93</td>
<td>F</td>
<td>3.91</td>
<td>7.777</td>
<td>0.000***</td>
</tr>
<tr>
<td>One-to-one after-sales service</td>
<td>3.87</td>
<td>F</td>
<td>3.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book review</td>
<td>3.32</td>
<td>H</td>
<td>3.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Coupons</td>
<td>3.22</td>
<td>H</td>
<td>3.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation</td>
<td>3.30</td>
<td>F</td>
<td>3.30</td>
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<tr>
<td>e-News</td>
<td>3.64</td>
<td>H</td>
<td>3.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* P=Personalized, NP= Not personalized

4.4 Effect of Customer Services on Perceived Care

A similar analysis was conducted regarding perceived care. As shown in Table 6, the users reported different levels of perceived care from receiving different customer services. One-way ANOVA was conducted to compare the means of perceived care level from different customer services. The results were found to be statistically significant (F=13.092, p<0.001), which indicates that customer services affect the perceived care level differently. A t-test revealed that the personalized services as a group scored significantly higher than the non-personalized ones (t=4.95, p<0.001). Thus, hypothesis H3 is supported.

By further examining the effects of individual services on personal care using Scheffe’s method of multiple comparisons, it is noted, as shown in Table 7, that one-to-one after-sales service and order processing/reporting (both personalized services) have significantly higher effects on the perceived care than the rest. That is, consumers feel that they are treated as valuable customers and well taken care of by the vendor when these two services are provided. The remaining five services do not have significant differences in this aspect.
Table 6. Perceived care induced from Different Customer Services

<table>
<thead>
<tr>
<th>Customer Service</th>
<th>Mean</th>
<th>Type*</th>
<th>Standard Deviation</th>
<th>F Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-time online sales service</td>
<td>3.88</td>
<td>P</td>
<td>0.293</td>
<td>15.092</td>
<td>0.000***</td>
</tr>
<tr>
<td>Order processing/returning</td>
<td>3.85</td>
<td>P</td>
<td>0.294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book review</td>
<td>3.60</td>
<td>NP</td>
<td>0.704</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation service</td>
<td>3.80</td>
<td>P</td>
<td>0.700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Click</td>
<td>2.60</td>
<td>NP</td>
<td>0.750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Coupon</td>
<td>3.30</td>
<td>NP</td>
<td>0.795</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Newse</td>
<td>3.55</td>
<td>NP</td>
<td>0.760</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***P<0.001  
* P=Personalized, NP= Not personalized

Table 7. Scheffe’s Multiple Comparisons of Difference in Perceived Care

<table>
<thead>
<tr>
<th>Difference in Means</th>
<th>Order Processing</th>
<th>Book Review</th>
<th>Recommendation Service</th>
<th>1-Click</th>
<th>e-Coupon</th>
<th>e-Newse</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-time online sales service</td>
<td>.03 **</td>
<td>-.02 **</td>
<td>-.00 **</td>
<td>.03 **</td>
<td>.00 **</td>
<td>.00 **</td>
</tr>
<tr>
<td>Order processing/returning</td>
<td>.05 **</td>
<td>.00 **</td>
<td>.00 **</td>
<td>.06 **</td>
<td>.05 **</td>
<td>.05 **</td>
</tr>
<tr>
<td>Book review</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Recommendation service</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>1-Click service</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>e-Coupon</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>e-Newse</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
</tbody>
</table>

***P<0.001, **P<0.01, *P<0.05

4.5 Relative Effect of Transaction Costs and Perceived Care

The final analysis deals with the relative effect of the perceived transaction cost and the perceived care level on the perceived usefulness of the customer services. Since the customer services are divided into two categories (personalized vs. non-customized), we cannot run a structural equation model on a mixture of categorical and numerical variables. A stepwise regression analysis was adopted to compare the effect of these two factors. The result is shown in Table 8.

We can see that the perceived care is the most influencing and significant factor because its standardized regression coefficient β is 0.572 and its R² contribution is 0.766 (t=14.528). The effect of transaction costs (β=0.368, R² = 0.042, t=9.356) is also significant but its effect size is less than that of the perceived care. Thus, the analysis shows that hypotheses H4 and H5 are supported.

5. DISCUSSION AND CONCLUSIONS

5.1 Summary of the Findings

In summary, our research has indicated the following observations. First, personalized customer services can generate higher perceived usefulness as compared to non-personalized ones. The ones that are perceived to be the most useful by customers are those that allow customers to trace the ordering and delivery process and providing post-sales services, while the least useful one is the one-click service.

Second, personalized services result in higher effect on both perceived economic benefits, as measured by the reduction of perceived transaction costs, and positive emotional feelings, as measured by the perceived care. This implies that an e-tailer can expect stronger positive attitude of its customers if its customer services are personalized.

Third, book recommendation service did not perform as well as many would anticipate. It In ranked 6th and 4th in transaction cost reduction and perceived care increase, respectively. Although this does not say that the recommendation service has no value, it may indicate the limitation of recommendation agents. This may be due to a low recommendation fit or low accuracy of the recommendations. For example, Liang, et al. (2006) found that high accuracy has a positive impact on user satisfaction. A practical implication of this is that e-tailers must be more careful about their recommendation algorithms when the product recommendation service is to be adopted.

Finally, it is perceived care that has the highest impact on the perceived usefulness of customer services. This finding indicates that in online services, emotion may be more important than economic incentives. This observation will influence the choice of customer services for e-tailers. The finding also indicates that a dual-core model is better than a single factor model such as the information overload reduction in explaining the effect of personalized services. This is also consistent with previous findings that both emotional and rational factors may affect the acceptance of recommendation agents.

5.2 Contributions and Limitations of the Study

The major contribution of this research is two-fold. Theoretically, we have developed a dual-core research model that combines economic (transaction costs) and emotional (perceived care) factors to explain the perceived usefulness of customer services at online bookstores. Our empirical findings have shown that the dual-core model is better than the economic or emotional factors alone in interpreting the variance of perceived usefulness.

In practice, our findings can be used to guide e-tailers on how to design, select and prioritize customer services. Specifically, e-tailers need to pay more attention to those services that result in higher perceived care. These findings also provide insights into the notion that customer services can increase customers’ perceived usefulness, which, based on the technology acceptance model, can in turn lead to a positive attitude on the vendor.

Therefore, the result supports the dual-core theory that argues the effect of personalized customer services is due to both economic and emotional factors, but the emotional factor of perceived care has a more powerful influence.
5.3 Limitations and Suggestions for Future Research

Notwithstanding the interesting findings and contributions of the research, we do recognize the following limitations:

First, the data were collected from a single country without culture diversity. In addition, the subjects were volunteers and knew that they were participating in an experiment, which may cause some biases. The reasonably large sample size and background diversity of the respondents may compensate in part for this limitation.

A second possible limitation is that we chose only seven customer services among the many offered online today. There may be useful customer services that were not included and the findings may not be applicable to those services not included in the study. Also, the findings from studying bookstores may not be generalizable to other types of online stores.

The third limitation is that due to lack of generally accepted questionnaires for measuring perceived value or transaction costs, we had to develop our own; and even though we pre-tested the questions, they may not have been perfect and suitable for use in other circumstances. Developing generally usable measurement instruments is a task that needs future research.

Finally, some of our conclusions are based on statistical significance but may not have enough practical meanings due to the small differences in the means calculated on a 5 point Likert-scale. Thus, we recommend that in the future a 7-point scale will be used.

Despite these limitations, we believe that the findings are important enough and that they provide us with a solid base for generating practical guides for managers and for conducting further research. Below are a few additional suggestions:

1) The effects found in this study could be investigated in different contexts, such as distinguishing between online buyers and online information seekers based on what is important for them (Cai and Jun, 2003), as well as distinguishing between the types of transactions conducted (buying books, travel services, computers, etc.), and exploring behavior in different platforms such as the mobile environment or auctions.

2) Conduct a similar study that includes more customer services and differentiate customer services based on different levels of personalization, instead of dividing them into two distinct groups: personalized and non-personalized.

3) Identifying success factors for customer and personalization services and finding the best practices that have been only partially explored by others (e.g., Huang and Lin, 2005; Brusilovsky, Kobsa and Nedji, 2007). Identifying such factors in different configurations could be very beneficial in a study of their perceived usefulness.

4) A further investigation into different varieties of each service and into possible additional variables such as the transaction quantity, frequency and quality, as they are related to usefulness (e.g. see Park, Lee, and Han, 2007) could also be useful.

5) More studies are needed to examine the generalization of the dual-core model to other constructs and problem domains. There have been several dual processes models for information processing, but the combination of economic and emotional factors is a new one that needs more empirical replications for confirmation of its value.

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7. REFERENCES


APPENDIX A : Sample questions

Sample questions used for collecting transaction costs, perceived care, and perceived usefulness data of the book matcher and mood finder recommendation services are provided below. Questions for other personalized services are similar, except that book matcher and mood finder were replaced by that service in the questions. A total of 56 questions for seven services (eight for each) was included in the questionnaire.
Recommendation services such as Book Matcher and Mood Matcher offered by online bookstores analyze your previous browsing and purchasing experiences or your indicated preferences and recommend books that may meet your interests accordingly. Please answer the following questions to indicate your opinion about this service. Where: 1- strong disagree; 2- disagree, 3- neutral, 4-agree, 5- strongly agree

Transaction costs: (3 questions)

1. I feel that the recommendation service of Book Matcher and Mood Matcher save my time in searching book information.
2. I feel that the recommendation service of Book Matcher and Mood Matcher save me money in searching books.
3. I feel that the recommendation service of Book Matcher and Mood Matcher give me more autonomy in the book ordering process.

Perceived care: (2 questions)

4. I feel that the online bookstore treat me as a valuable customer because I receive information from the recommendation service of Book Matcher and Mood Matcher.
5. I feel that the online bookstore care of my needs because I receive information from the recommendation service of Book Matcher and Mood Matcher.

Perceived usefulness: (3 questions)

6. Book Matcher and Mood Matcher provide me with useful information that allows me to find the books I need.
7. Book Matcher and Mood Matcher provide me with convincing information that reduces the uncertainty for me to buy the book.