

# Effects of Web Service Quality and Product Categories on Willingness to Buy in Electronic Commerce: A Research Model and Empirical Exploration

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## Abstract

This paper explores the way in which web service quality at the point of purchase influences consumers' perceptions of value and willingness to buy. For this purpose, we provide a research model on the basis of marketing theories for consumers' purchase behavior. The empirical results imply that functional web quality has a direct effect on willingness to buy and technical web quality influences consumer perceptions of product quality and value.

## 1. Introduction

The Internet is an extremely important technology and its exponential growth makes retailing on the web a familiar phenomenon. In response, many retailers have launched business web sites in order to improve the quantity and quality of their web customers (Heijden et al., 2001). However, many studies report that the actual sales volume of web-based retailing remains relatively low (Jarvenpaa & Todd, 1997). For example, the US Commerce Department (2001) reports that sales of web-based retailing in 2001 account for only one percent of total sales. Understanding the role of purchase behavior on the web can help solve this nagging situation.

The primary objective of this paper is to build a theoretical framework for identifying purchase behavior on the web. For this purpose, a research model is developed

based on marketing theories of consumers' purchase behavior. The model can investigate how web service quality at the point of purchase influences consumers' perceptions of product quality, value, and willingness to buy. Then, the moderating effects of product categories are examined. From a theoretical perspective, this study extends existing marketing studies on purchase behavior into the electronic market environment. From a practical perspective, it can help managers establish competitive electronic shopping malls.

## 2. Literature Review

Studies on web purchase behavior have only recently begun to appear. These studies can be categorized into trust-oriented and web design-oriented perspectives (Heijden et al., 2001). The trust-oriented perspective argues that perception of trust in a company determines customers' attitudes towards web purchase behavior (Hoffman et al., 1999, Ratnasingham, 1998). The more people trust the company, the more people are willing to buy products through the web.

The web design-oriented perspective suggests that perceived purchase facilitation of a web site should promote purchase behavior on the web (Lohse & Spiller, 1998, Pereira, 2000, Huizingh, 2000). This perspective has insisted that all other things being equal, better web site design leads to improved purchase behavior on the web.

However, neither the trust-oriented perspective nor web design-oriented perspective is sufficient for understanding

consumers' purchase behavior on the web. Although a theoretical model of marketing on the web should include the marketing functions and technical characteristics (Palmer & Griffith, 1998), both perspectives do not fully address them. Furthermore, both of them have been developed on the basis of general behavior theory like TRA and TBP or technology-oriented theory like TAM. These theories are not sufficient for explaining consumers' purchase behavior. Due to this weakness, indicators such as product quality, relative price, and perceived value are excluded. To fill this gap, this study adopts the consumers' purchase behavior model based on marketing theory. Consumers' purchase behavior on the web can be tested by using this model.

### 3. A Research Model and Hypotheses

In exploring consumers' purchase behavior on the web, this study proposes a research model on the basis of marketing theories for purchase behavior (Dodds et al., 1991; Sweeney et al., 1997), the WebQual method (Barnes & Vidgen, 2001), and product categories on the web (Lee et al., 2001).

#### A purchase behavior model in marketing research

Marketing researchers have provided empirical explorations of the relationships among perceived product quality, perceived relative price, perceived value, and willingness to buy. Service quality has also been recognized as an important strategic retailing weapon (Fisk et al., 1993). Using Gronroos's (1990) conceptualization of technical and functional quality, they provided a model in the context of service quality, product quality, relative price, perceived value, and willingness to buy. Functional service quality implies the manner in which the service is provided. Technical service quality refers to what is received from the service or the outcome of the service (Gronroos, 1990).

#### The WebQual method

Barnes and Vidgen (2001) developed the WebQual instrument by applying the work on SERVQUAL to web site

evaluation. This paper adopts the WebQual index to assess the service quality of consumer purchase behavior on the web. Functional web service quality means the way in which the service is provided for customers on the web. Technical service quality can be defined as what customers receive during their interactions with a web site.

#### Product category

On the web, all products are not equal. Using web presentability and customers' involvement, Lee et al. (2001) proposed four product categories: high involvement and high web presentability, high involvement and low web presentability, low involvement and high web presentability, and low involvement and low web presentability. Based on the Lee et al.'s (2001) research, our research model incorporates the moderating effects of the product categories on the relationships among web service quality, perceived product quality, perceived value, and willingness to buy.

In summary, we propose the following research model which includes web service quality (functional and technical), perceived product quality, relative price, perceived value, and willingness to buy (see Figure 1).

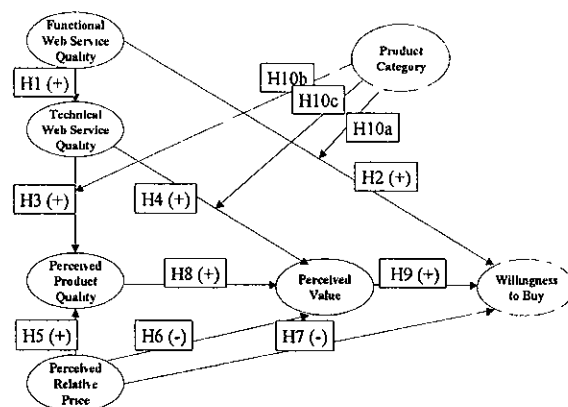


Figure 1 Proposed Research Model

### 4. Methodology

#### 4.1 Sample and data collection

To assess our research model as shown in Figure 1, we

adopt an experiential survey approach to collect data from a group of senior undergraduate students majoring in management information systems in two Korean universities. Students participated in supervised sessions held in a computer laboratory at the universities. The participants performed four shopping activities: (i) buying a notebook computer, (ii) buying a ring for their boy (or girl) friend, (iii) buying a CD as a gift for a friend, and (iv) buying toys for younger brother/sister or nephew/niece. After each of the four shopping activities, the participants were asked to complete questionnaires. They were provided with an incentive, educational value. This incentive helped ensure the high level of motivation that was exhibited by participants. Three hundred and forty-four questionnaires were collected over two weeks in April 2002.

#### 4.2 Research constructs

The questionnaire involved a number of items that were used to estimate the constructs of interest. It was developed based on previous literature by the use of existing scales where possible. Measures related to web service quality were developed on the basis of the items of Barnes and Vidgen (2001). However, two questions were omitted because they require the user to fully complete a purchase transaction. Measures of value, willingness to buy, and product quality were adopted from Dodds et al. (1991). Perceived relative price was developed based on Sweeney et al. (1997). It was defined as the consumer's perception of product's price compared to other brands of the same product with similar specifications. Each item was based on a five point Likert scale from 'very low' to 'very high'.

### 5. Research Results

#### 5.1 Statistical analysis

The hypotheses of our model were tested using regression analysis. Figure 2 summarizes direct effects of our regression results.

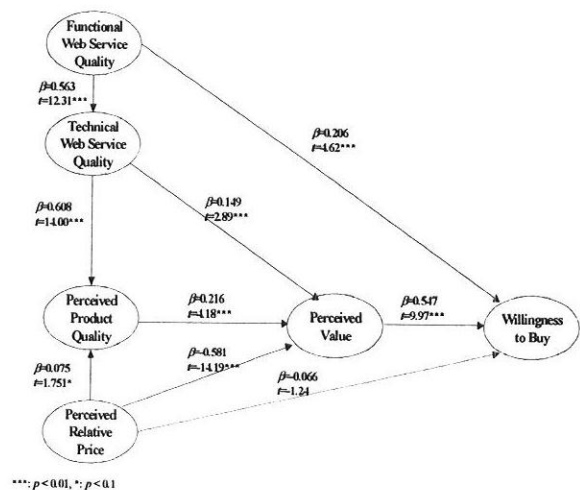


Figure 2. Results of Direct Effects

Examinations of the parameters for direct effects are significant; except for H7, hypotheses 1 through 9 are supported.

Other important issues are the moderating effects of product categories. Table 1 reports the results of  $R^2$  values from the regression of (i) functional web service quality on willingness to buy by product category, (ii) technical web service quality on product quality by product category, and (iii) technical web service quality on value by product category.

Table 1. Results of Moderating Effects of Product Category on the Relationship

(a) Between Functional Web Service Quality and Willingness to Buy

Variables	HI & HW <sup>2</sup>	HI & LW <sup>3</sup>	LI & HW	LI & LW
N	86	86	86	86
R <sup>2</sup>	0.571	0.511	0.348	0.347
Z	HI & HW	Z = 0.573 p = 0.283	Z** = 1.987 p = 0.024	Z** = 1.995 p = 0.023
	HI & LW	-	Z* = 1.414 p = 0.077	Z* = 1.422 p = 0.077
	LI & HW	-	-	Z = 0.008 p = 0.497
	LI & LW	-	-	-
	Result	High group (HI & HW and HI & LW) vs. Low group (LI & HW and LI & LW)		

(b) Between Technical Web Service Quality and Product Quality

Variables	HI & HW	HI & LW	LI & HW	LI & LW
N	86	86	86	86
R <sup>2</sup>	0.321	0.478	0.303	0.308
Z	HI & HW	Z* = -1.340 p = 0.088	Z = 0.150 p = 0.437	Z = 0.109 p = 0.457
	HI & LW	-	Z* = 1.491 p = 0.067	Z* = 1.449 p = 0.072
	LI & HW	-	-	Z = -0.042 p = 0.483
	LI & LW	-	-	-
	Result	High group (HI & LW) vs. Low group (HI & HW, LI & HW, and LI & LW)		

(c) Between Technical Web Service Quality and Value

Variables	HI & HW	HI & LW	LI & HW	LI & LW
N	86	86	86	86
R <sup>2</sup>	0.531	0.491	0.278	0.449
Z	HI & HW	Z= 0.368 p=0.357	Z**=-2.188 p=0.014	Z= 0.7413 p=0.238
	HI & LW	-	Z**=-1.819 p=0.034	Z= 0.3725 p=0.355
	LI & HW	-	-	Z* = -1.446 p=0.072
	LI & LW	-	-	-
	Result	High group (HI & HW, HI & LW, and LI & LW) vs Low group (LI & HW)		

1 (HI high involvement), 2 (HW high web perceptibility), 3 (LW low web perceptibility), 4 (LI low involvement)  
\*\* p < 0.05 \* p < 0.1

Using Fisher's Z transformation (Neter et al., 1989), Table 1 illustrates the moderating effects of product categories. Table 1(a) represents that the R<sup>2</sup> values are significantly higher for the HI & HW and HI & LW as compared to the LI & HW and LI & LW. Thus, it is confirmed that product categories moderate the effect of functional web service quality on willingness to buy. Z values of Table 1(b) indicate that the R<sup>2</sup> value of HI & LW is significantly higher than that of HI & HW, LI & HW, and LI & LW. Moderating effects of product categories on the relationship between technical web service quality and product quality are also confirmed. Although the p-value is relatively low, Table 1(c) shows that R<sup>2</sup> value of LI & HW is significantly lower than that of HI & HW, HI & LW, and LI & LW. This implies that product categories moderate the effect of technical web service quality on value. In sum, hypothesis 10 is supported.

## 5.2 Implications

Our results can help web shopping mall managers promote the customers' willingness to buy. In order to establish competitive web shopping malls, managers should not only focus on good quality products and appropriate prices but also on good web service quality. Functional web service quality also has a significant effect on a customer's willingness to buy. In particular, web sites that deal with high involvement products such as notebook computers and jewelry should be more carefully designed in view of their functional web service quality (see Table 1(a)).

Technical web service quality is important for perceived product quality and value, hence influencing customers'

willingness to buy indirectly. Our analysis confirms that technical web service quality such as reliability has a significant effect on the perceived product quality and value attached to a specific product. It implies that web sites managers should make an effort to convince customers of their web service quality. Furthermore, this study finds that customer needs for technical web service quality change depending on product categories (see Table 1b and 1c).

The non-significant findings in this study also bear some implications. Our study shows no direct relationship between price and willingness to buy. This rather intriguing result may be explained in part by the concept of an acceptable price range. Customers have a set of prices that are acceptable rather than only one single price (Monroe & Petrosius, 1981). Therefore, customers not only may refrain from buying a product when they consider its price too high, but also may be doubtful of its quality if its price is too low (Cooper, 1969).

Some theoretical implications are also drawn. First, our model is likely to be more rigorous for explaining consumers' purchaser behaviors on the web. Second, this study divides web service quality into functional and technical quality. Furthermore, the relationship between functional and technical web service quality is provided. Third, this study investigates the moderating effects of product categories on the relationship between web service quality and perception of product quality, value, and willingness to buy.

## 6. Conclusion

This paper provides a research model for investigating customers' purchase behavior on the web. The model can explain how web service quality can affect consumers' perception of value and willingness to buy according to product categories. It also explores the moderating effects of product categories on the relationship between the web service quality and perceived product quality, value, and willingness to buy.

## Reference

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