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Web Design in E-Commerce: A Theory and Empirical Analysis

Jaeki Song
Texas Tech University

Fatemeh Zahedi
University of Wisconsin, Milwaukee

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Jaeki Song
Jerry S. Rawls College of Business Administration
Texas Tech University
jsong@ba.ttu.edu

Fatemeh "Mariam" Zahedi
School of Business Administration
University of Wisconsin, Milwaukee
zahedi@uwm.edu

Abstract

In the Internet market, websites are the main interface between online merchants and their customers. Effective website design plays a critical role in attracting and maintaining customers' interest and in influencing their purchase behavior. Despite the singular significance of website design, little theoretical knowledge is available regarding how web-design elements impact the purchase behavior of online shoppers. By drawing on the theory of planned behavior and interpersonal influence, we develop and empirically test a conceptual model for the process by which web design elements could influence the purchase intention of online customers. This research provides a theoretical framework for the design decisions regarding websites in order to accommodate the salient features of online shopping.

Keywords: Web design elements, beliefs system, theory of planned behavior, interpersonal influence.

MOTIVATIONS AND RESEARCH QUESTIONS

The rapid explosion of e-commerce and the growth of online sales have changed consumers' purchasing behavior (Bellman et al. 1999). There is a growing body of literature concerning the impact of the Internet on market factors, including price, products, service, and privacy in the new digital economy (Bakos 1998; Hoffman et al. 1999; Jarvenpaa and Todd 1996/97). In the Internet market, retailers' websites have become a valuable channel for selling and interacting with customers, and an important medium for communicating with the general public as well as potential consumers (Hoque and Lohse 1999; Jarvenpaa and Todd 1996/97). A company's website design and content reflect its business strategy as well as its operational policies, such as pricing and service. Hence, design of a company's website can have a critical impact on the firm's success in the Internet market. Since the ultimate goal of an e-commerce website is the customer's purchase action, insight into how a website's design impacts potential customers' purchase behavior could be of great value. Therefore, this study addresses the following research questions:

- What is s the theoretical basis for explaining the possible relationship between web design and consumers' purchase behavior in the Internet market?
- How can we measure and test the efficacy of web design elements?

THEORETICAL BACKGROUNDS AND RESEARCH MODEL

In exploring consumers' purchase behavior, we adopt the behavior theories from psychology and marketing, particularly the *theory of planned behavior* (Ajzen 1985, 1991) and *interpersonal influence approach* (Bearden et al. 1989; Bearden and Rose 1990). These theories have been adopted by MIS and marketing researchers for examining the adoption and use of information technology, and for explaining consumers' behavior (Beardon et al. 1989; Harrison et al. 1997; Mathieson 1991; Oliver and Beardon 1985; Taylor and Todd 1995).

In the theory of planned behavior (TPB), Ajzen (1991) reasons that individuals' behavioral intention is not only a function of attitude and subjective norm, it is also a function of their deficiencies and external obstacles. Harrison et al. used the TPB to model the adoption of a variety of new information technologies in small businesses. Taylor and Todd used the TPB (as well as the technology acceptance model) in explaining IT usage behavior. Mathieson also used the TPB as well as the technology acceptance model to predict users' intentions, specifically the use of spreadsheets.

Another relevant approach for explaining individuals' behavior, especially consumers' behavior, is the *interpersonal influence* model derived from psychology and modified in the marketing area (Beardon et al. 1989). Interpersonal influence has been recognized as a major determinant of consumer behavior (Bearden et al. 1989; Bearden and Rose 1990).

Drawing on the TPB, we argue that for web design elements to influence online customers, the elements have to change customers' salient beliefs related to e-commerce. We have identified five belief constructs that web design elements may influence (Figure 1).

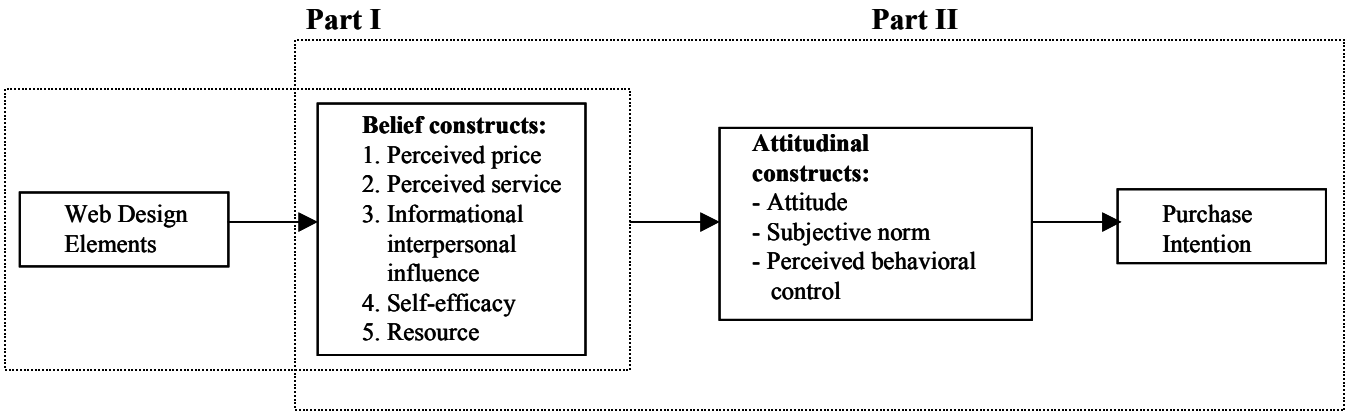

Figure 1. The Conceptual Model

First, it is shown that price and service are of great importance to online shoppers (Javenpaa and Todd 1996/97). Hence, we divide underlying beliefs related to attitude into beliefs regarding perceived price and perceived service. Perceived price refers to the consumers' perception of low price (Lichtenstein et al. 1991). Perceived service, on the other hand, could have various overlapping dimensions such as responsiveness, reliability, tangibility, assurance, and empathy (Javenpaa and Todd 1996/97; Kettinger and Lee 1997; Parasuraman et al. 1988). Since in online shopping, the vendor's service is judged by its reliability, which is partly dependent on its responsiveness, we define the belief regarding perceived service as a combination of perceived responsiveness that refers to meeting customer's needs during the entire shopping experience, and reliability that refers to the degree to which the online seller could be counted on for delivering what is promised and when it is promised. Other dimensions overlapping with service quality, such as tangibility, assurance, and empathy, enter our model through other more appropriate belief constructs, including informational interpersonal influence, self-efficacy, and resource facilitation.

The TPB includes beliefs regarding normative influence. Normative influence is related to the individual's beliefs regarding what other people think about his/her behavioral intention (Ajzen 1991). There is little support for the significance of this construct in the subsequent application of the TPB in IS. In the Internet market, customers are more interested in what other people know about products and services rather than caring about how other people judge their purchase behavior. Using the interpersonal influence approach, we included this aspect of online shoppers in their belief regarding informational interpersonal influence, defined as accepting information from others as the evidence about reality, which could be gathered either by seeking information from knowledgeable people or by observing others' behavior (Beardon et al. 1989).

Beliefs regarding self-efficacy impact the attitudes about behavior intention. Self-efficacy is defined as "people's beliefs about their ability to produce performances that influence events affecting their lives" (Bandura 1995, pg. 434). The concept of self-efficacy is similar to perceived ease of use, which refers "the degree to which a person believes that using a particular system would be free of effort" (Davis 1989, pg. 320). However, self-efficacy focuses on the perception about one's own ability to accomplish the intended behavior, whereas the focus of ease of use is on the system's features. One may reinforce beliefs

regarding self-efficacy in online shopping by increasing ease of use, providing personalized features, or presenting information on a more effective manner, such as using graphical or audio format. According to the TPB, however, it is the belief regarding self-efficacy that impacts a person's sense of control and power, which in turn reinforces the purchase intention.

Finally, in the Internet market, customers would like to minimize the mental effort they expend on online shopping (Jarvenpaa and Todd 1996/1997). The beliefs regarding resource facilitation accommodate this aspect of e-commerce. Resource facilitation refers to the availability of resources needed to perform the intended behavior (Taylor and Todd 1995; Triandis 1977). Web design elements that provide facilitating resources, such as product customization or facilities for payment, may reduce the mental efforts and increase the customer's sense of control and power regarding the availability of resources, thus reinforcing the behavior intention.

As in the TPB, the above five belief constructs may not have the same evaluation, motivation, or importance for different individuals. Therefore, beliefs are constructed by combining their constituent manifest variables with corresponding measures of their evaluation, motivation, or importance (as discussed in Appendix A).

Web design elements are defined as the features, components, and information used in developing e-commerce websites, which may influence customers' purchase behavior through the reinforcement of their positive beliefs. There have been a number of attempts to identify and categorize web design elements (Alba et al. 1997; Jarvenpaa and Todd 1996/97; Keeney 1999; Lohse and Spiller 1998), with little theoretical basis. The connection between web elements and beliefs provides us with a theoretical foundation in that web design elements could be grouped into five categories, each influencing one set of beliefs, as promotion, service, informational interpersonal influence, self-efficacy, and resource facilitation, as shown in Figure 2.

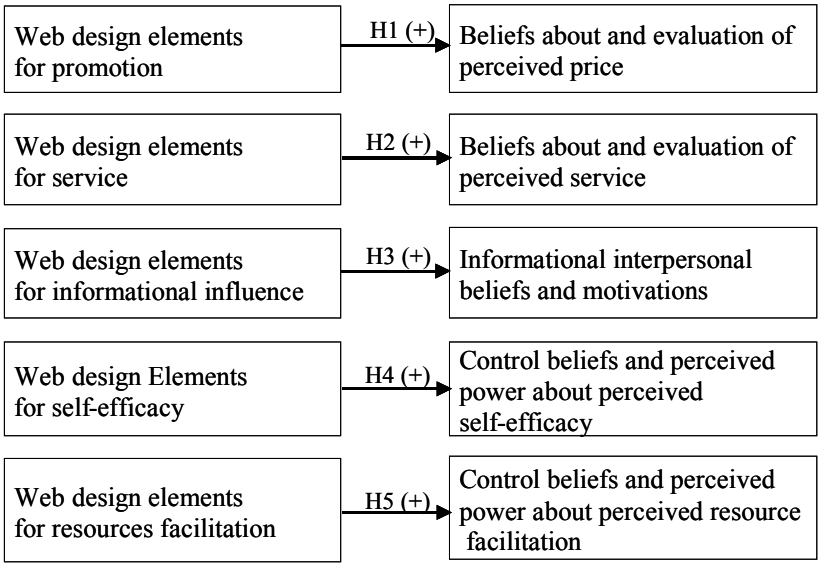

Figure 2. The Conceptual Model—Part I

From this perspective and based on an extensive literature review, we identified web design elements and categorized them into five groups as shown in Table 1. Promotion is one way to communicate information about price and other important attributes offered by online retailers. Elements of price-based promotion are price discounting, coupons, gift certificates, special offers, and rebates (Engel et al. 1995; Tellis 1998). Price-discounting information can be displayed on a website with two cues: *price comparison cues* and *semantic cues* (Biswas et al. 1999; Lichtenstein et al. 1991). Berkowitz and Walton (1980) found that comparison cues influence all price-perception constructs for all products they tested, whereas semantic cues are only significant for a given product. Non-price-based promotion includes sweepstakes, frequent-customer club, and a "what's new" section.

Table 1. Categories of E-Commerce Web Design Elements

Categories	Elements of Web Design
Promotion	– **P1**: Price discounting presentation – **P2**: Price comparison with other websites – **P3**: Product recommendations when customers visit next time – **P4**: "What's new" section – **P5**: Receiving e-mail about new products – **P6**: Gift certificates and coupons via e-mail – P7: Gift, gift wrap, free message
Service	– **S1**: Guarantee policy, such as warrantee and money back guarantee – **S2**: Capability to track order – **S3**: Feedback section – **S4**: Capability to contact sales representatives – **S5**: Security section describing safe transaction – **S6**: Privacy assurance section
Informational influence	– **NI1**: Customer ratings of the product – **NI2**: Customer comments about the product – **NI3**: Expert comments about the product – **NI4**: The sales rank of the product on the website – NI5: Customer testimonials – NI6: Bulletin board – NI7: Online chat room or discussion forum – NI8: Provide interest/user group
Self-efficacy	Elements related to **personalization**: – SE1: Storing customers' personal information – SE2: Providing personalized information for customers – SE3: Not having to scroll down on the page – **SE4**: Not having to deal with a crowded page – **SE5**: Not too many clicks from home page to shopping page – **SE6**: Using color to highlight information – SE9: Language translation option – SE10: Currency conversion option – SE11: Providing different levels of authorization/permission for access and purchase Elements related to **ease of use**: – **SE 7**: Information in tabular form – **SE 8**: Price information in the product listing – **SE 12**: Uniformity of design formats across web pages – **SE15**: Ease of canceling product Element related to **effective information**: – **SE 13**: Graphical information – SE 14: Audio interaction
Resource facilitation	Elements related to **enhancing product knowledge** – **RF1**: Frequently asked questions – **RF3**: Detailed product description – **RF4**: Picture of the product – **RF5**: Ability to see a large picture of the product – **RF6**: Ability to test the product – **RF7**: Links to other related websites – **RF13**: Ability to search for the product Elements related to **product customization** – **RF8**: Ability to assemble components – **RF10**: Ability to buy made-to-order product Elements related to **facilitating payment and receiving** – **RF2**: Various shipping options – **RF9**: Various payment options

In the context of Internet malls, Lohse and Spiller describe a web site's promotional elements as promotion of the mall entrance (advertising), percentage of price discounts, total number of featured products, and the "what's new" section. We postulate that the presence of these elements impacts price belief (H1).

When customers have less opportunity to examine the nature and features of a product or service, they have a higher level of uncertainty about the purchase outcome and more hesitation in making the purchase (Davis et al. 1995; Wright and Lynch 1995). Providing services such as money-back guarantees, warrantees, and sections on security and privacy may reduce customers' uncertainty and perception of risk about purchasing the product (Davis et al. 1995; Padmanabhan and Rao 1993). Web design elements that could enhance the perception of service influence the individual beliefs that the online seller is standing behind the product and will be responsive if problems occur. Therefore, we postulate that the presence of web design elements for service positively impacts beliefs about perceived service (H2).

Informational interpersonal beliefs regarding purchase intention could be influenced by customers' ratings, customers' comments, customer testimonials, experts' comments, and sales ranking of the product. We hypothesized that presence of web design elements for informational influence positively impacts the interpersonal informational beliefs (H3).

Website elements that help customers in the effective use of a website are included in the self-efficacy category. The elements in this category may personalize the website to the special needs of customers, increase the ease of use, or increase the effectiveness of the information presentation. We hypothesize that the presence of web design elements for self-efficacy has a positive impact on beliefs about self-efficacy (H4).

Elements that provide resources to customers seeking more information about a product, customize the product according to customers' needs, and facilitate the purchase and receipt of the product fall in this category. We hypothesize that the presence of web design elements for resource facilitation positively impacts beliefs about resource-facilitation (H5).

According to the TPB, the positive reinforcement of beliefs could lead to changes in behavior intention through the attitude, subjective norm, and perceived behavior control constructs. Applied to the web design theory, we postulate that the changes in customers' beliefs lead to changes in the internal forces (attitude), external forces (influences of others), and perception of control over the purchase behavior as shown in Figure 3, and briefly discussed below.

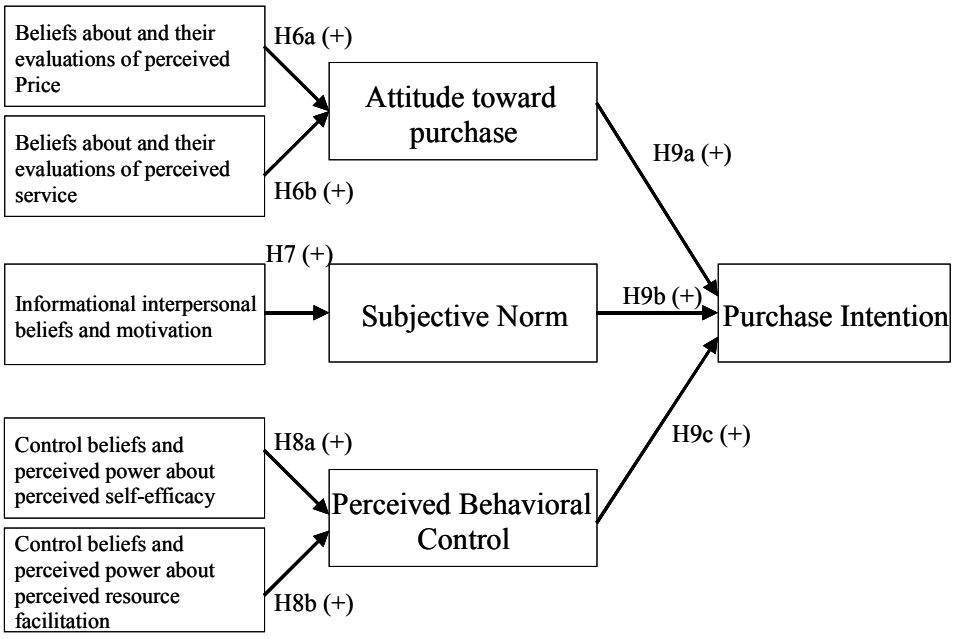

Figure 3. Research Model—Part II

First, price has been identified as one of the important stimuli for customers' shopping behavior (Jarvenpaa and Todd 1996/97). In the Internet market, shoppers bear a relatively low cost in searching for information on products and their prices. This in turn increases their price sensitivity (Bakos 1997; Lynch and Ariely 2000). Burton et al. (1998) found that there is a positive relationship between price consciousness and favorable attitude. In addition to price, service has also been identified as a major factor in online shopping (Jarvenpaa and Todd 1996/97; Woodside and Trappey 1992). We, therefore, posit that favorable beliefs and their evaluations regarding perceived price and perceived service are positively related to attitude toward purchase (H6a and H6b).

Informational interpersonal beliefs regarding others' opinions about the purchase impact on subjective norm (Bearden et al. 1989; Bearden and Rose 1990). A recent study shows that information from experts greatly influences information-seekers' decisions (Gilly et al. 1998). This is particularly important in online shopping where merchants provide information about other peoples' views, behavior, comments, and ratings. We, therefore, hypothesize that informational interpersonal beliefs and motivations regarding buying a product on a website positively impact subjective norm (H7).

Previous studies found that self-efficacy significantly impacts perceived behavioral control and subsequently the behavioral intention (Manstaed and Van Eeklen 1998; Taylor and Todd 1995; Terry and O'Leary 1995). Furthermore, the likelihood of behavior is affected by the presence or absence of facilitating conditions (Traindis 1977). The Internet market is different from traditional markets in the way it presents products and services, and has more constraints—customers can't physically touch the product or have direct personal contact with sales representatives in the store (Hoque and Lohse 1999; Jarvenpaa and Todd 1996/97; Spiller and Lohse 1997/98). We, therefore, postulate that control beliefs and their importance regarding self-efficacy and resource facilitation impact perceived behavioral control (H8a and H8b).

Finally, based on results of TPB application in various areas, we postulate that attitude toward purchase, subjective norm, and perceived behavioral control positively impact purchase intention (H9a, H9B, and H9c).

THE EMPIRICAL STUDY

Identification of Important Web Design Elements

As shown in Table 1, we initially identified 47 elements from the literature review. In the first phase of the study, we conducted a survey in order to determine the important web design elements to be used in testing the model and in reducing the complexity of the subsequent experimental design. We developed a questionnaire for this purpose and conducted two pilot tests for the questionnaire. The participants in this study were undergraduate business students in a major midwestern metropolitan university. Forty subjects participated in the first pilot test, and 22 subjects took part in the second pilot test. The main survey was completed by 121 participants, who were asked to rate the importance of the individual design items, as listed in Table 1 (0-not important to 10-very important). For each web design category, a cutoff value of 5.0 was used for identifying important design elements, which are highlighted in bold in Table 1.

Instrument Development

The instrument design for measuring model constructs was accomplished in a number of steps. First, items for measuring each construct were generated based on an extensive literature review in order to ensure content validity (see Appendix A). Next, in order to assess the initial construct validity, we performed card sorting of the instrument questions by following the procedure recommended by Moore and Benbasat (1991). We conducted a two-round sorting procedure, with four judges in each round. The judges created categories, and then assigned each item into the categories that represented underlying constructs. In the first sorting procedure, one professor and three students participated. Based on the first sorting result, we dropped three items from the original scales. Four new judges were recruited for the second round sorting. The overall item placement ratio and the averaged *Kappa* coefficient from the second sorting were 91.3% and 0.84, respectively. The results supported the initial construct validity of the instrument. We then tested the instrument in two rounds of pilot testing, with 49 participants in the first pilot test and 41 in the second pilot test. Based on the results of the pilot tests, the wording of questions was modified and the instrument was finalized with 35 sets of questions (Appendix B).

Experimental Design and Measurement Checks

We tested the model using lab experiments. The experimental design was a full factorial combination of five web design categories. We created 32 different websites that contained different combinations of web design features (2^5=32)—a particular category of web design elements could be present or absent from a website. For example, website #2 contained web design elements for promotion, service, informational interpersonal influence, and self-efficacy, but lacked the web design elements for resource facilitation.

The participants were randomly assigned to different websites. A short instruction containing the purpose and assumption of the study was given to the participants, and participants were asked to examine their assigned websites. They then were asked to fill a questionnaire to check which design elements were available on their assigned website in order to check whether the participant paid full attention to the experiment. Once the participants completed the manipulation check, they were asked to fill out the main instrument. Respondents who did not check the availability of elements with 80% or more accuracy were deleted from the data set (10 observations). A total of 639 observation (349 for male and 290 for female) were included in the analysis. The participants had an average age of 22 years and had relatively high web experience (above four years); 50% of the subjects had made three purchases in the last 12 months with an average spending amount of $50. This profile of the subjects indicates that they could be considered as representatives of real web customers within their age group.

We evaluated construct reliability (Table C-1 in Appendix C). All constructs have reliabilities above 0.70. An exploratory factor analysis of pooled constructs supported the discriminant validity of constructs, as shown in Table C-2 in Appendix C. To examine convergent validity, we performed confirmatory factor analysis for the items hypothesized to measure each construct separately. The items for each construct loaded into only one factor with eigenvalue of more than 1, which is an indication of convergent validity. Furthermore, there were high correlations between constructs and their corresponding overall questions (Table C-3 in Appendix C). Therefore, predictive validity was supported as well.

STATISTICAL ANALYSIS

Part I

The hypotheses in Part I of the model (Figure 2) were tested using least-square regression analysis. The factor scores of the belief construct in each category was the dependent variable and the dummy variable for the presence or absence of the related category of web design element was the independent variable, as shown in Table 2. The result of analysis indicates each belief was significantly and positively reinforced by the category of web design elements related to that belief. Therefore, hypotheses 1 through 5 were supported.

Table 2. Regression Analysis: Beliefs Constructs on Web Design Category

Dependent Variable (factor scores of belief constructs)	Constant (p-value)	Corresponding Web Design Category (dummy variable)	F-value
Perceived Price	-0.540 (0.000)	1.052 (0.000)	244.32
Perceived Service	-0.523 (0.000)	1.032 (0.000)	272.69
Informational Interpersonal Beliefs	-0.764 (0.000)	1.535 (0.000)	965.39
Perceived Self-Efficacy	-0.136 (0.000)	0.273 (0.000)	14.31
Perceived Resource Facilitation	-0.746 (0.000)	1.498 (0.000)	923.43

Part II

To test Part II of the model, we employed structural equation modeling techniques using the latest software (*Mplus*). The estimation method was mean-adjusted maximum likelihood estimator. For overall model fit, the normed chi-square statistics (chi-square divided by degree of freedom) indicated that the model fits the data adequately (χ^2/DF = 2.645). In addition, other fit indices showed that the model provided a good fit to the data (RMSEA = 0.051; CFI = 0.961, TLI = 0.957).

As indicated Figure 4, all hypotheses were supported except for H8a. The coefficients from perceived price and perceived service to attitude, from informational interpersonal beliefs and motivation to subjective norm were significant, and from perceived resource facilitation to perceived behavioral control was significant.

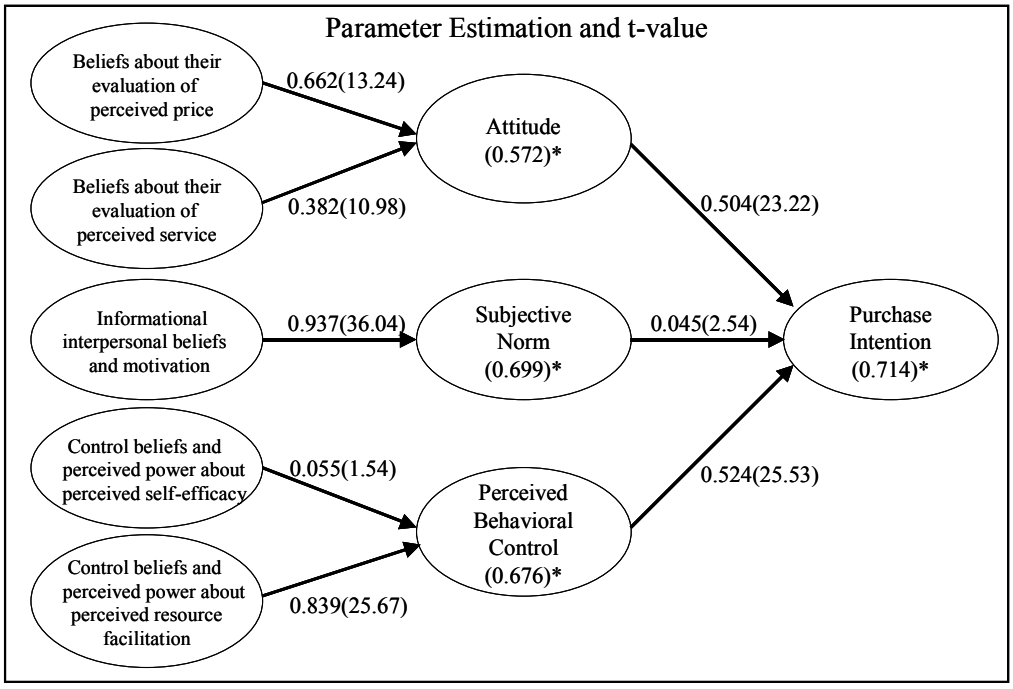

Figure 4. Structural-Equation Estimation of Research Model—Part II

Also, the coefficients from attitude, subjective norm, and perceived behavioral control to purchase intention were significant. However, the path between perceived self-efficacy and perceived behavioral control was not significant. This could be explained by the fact that most participants had a high level of familiarity with the web and a high percentage of them have had experience in web shopping.

The explanation power of the proposed model was reasonable. The perceived price and perceived service helped explain attitude with $R_A^2 = 0.572$ and informational interpersonal beliefs and motivation also explained subjective norm with $R_{SN}^2 = 0.699$. In addition, perceived self-efficacy and perceived resource facilitation explained the perceived behavioral control with $R_{PBC}^2 = 0.676$. Furthermore, attitude, subjective norm, and perceived behavioral control explained purchase intention with $R_{PI}^2 = 0.714$.

CONCLUDING REMARKS

In e-commerce, websites play a critical role in attracting and maintaining potential online customers. They are important channels of communication between customers and sellers and sometimes a company's sole interface with customers and the world at large. At present, to our knowledge, there is no theoretical framework for designing websites in promoting e-commerce. This deficiency was the motivation of this study in developing a theory for explaining how web design elements could influence online shoppers' purchase behavior.

We developed the belief structures related to the online shoppers' behavior and used them to provide a theoretical framework for categorizing web design elements. Using the belief structures, we expanded and augmented the theory of planned behavior with

informational interpersonal influence in order to show how the changes in shoppers' beliefs through the manipulation of web design elements could change their purchase intentions via changes in their attitude, subjective norm, and perceived behavioral control. The model presented in this paper provides a building block for the theory of website development and a measurement for the efficacy of web design elements in influencing customers' purchase behavior.

Our findings have important implications for practitioners. Our model provides a concrete tool to measure the impact of their web design elements in various laboratory settings before full deployment of their website. Using their business strategy, online sellers could identify the customers' beliefs they intend to influence through appropriate web design elements, and then measure the effectiveness of their design. Hence, our findings offer an opportunity to design and evaluate websites for meeting customers' needs and to increase potential sales. Our framework also helps companies in gauging the efficacy of new interface technologies in impacting their target customers' belief systems prior to committing extensive resources in deploying such technologies. This will provide focus in the adoption of interface technology in e-commerce and provide a more concrete foundation for deploying the appropriate website technologies.

This study could be extended in a number of ways. We tested the model using a single product and for the young and skilled segment of web shoppers. It should be tested with multiple product types and other segments of online shoppers to increase the generalizeability of the results. The impacts of personal and cultural control factors should also be investigated. Furthermore, the experiments in this study examined the impact of the presence or absence of web design elements in five categories. The experiments could he expanded to include various gradations of the presence of web design elements and/or subcategories of such elements. On the theoretical front, a more complex model could be developed to include customers' actual purchase actions.

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Appendix A
Constructs, Measures, and Operationalizations

Theoretical Constructs	Operational Definitions	Source
Beliefs about and evaluations of perceived price	Beliefs regarding the low price and the evaluation of having low price	Ajzen (1991); Lichtenstein et al. (1993)
Beliefs about and evaluations of perceived service	Beliefs regarding the promised service and its evaluation	Parasuraman et al. (1988); Kettinger and Lee (1994, 1997)
Informational interpersonal beliefs and motivations	Beliefs regarding the referent group and other opinion about the product and motivation to comply with them	Ajzen (1991); Bearden et al. (1989); Oliver and Beardon (1985)
Control beliefs and perceived power about perceived self-efficacy	Beliefs regarding the extent of self confidence and its importance	Taylor and Todd (1995); Terry and O'Leary (1995)
Control beliefs and perceived power about perceived resource facilitation	Beliefs regarding the saving time and effort using resources and its importance	Taylor and Todd (1995)
Attitude toward purchase	Customers' favorable/unfavorable view regarding the purchase of the product	Ajzen (1991); Harrison et al. (1997); Manstead and Van Eckelen (1998); Mathieson (1991); Taylor and Todd (1995)
Subjective Norm	Perceived social pressure/others' opinions regarding the product and using other people's information in order to avoid unsatisfactory outcome	Ajzen (1991); Bearden et al. (1989); Oliver and Beardon (1985); Mathieson (1991); Taylor and Todd (1995)
Perceived behavioral control	Perception regarding access to resources and opportunities for performing purchase	Harrison et al. (1997); Mathieson (1991); Taylor and Todd (1995); Terry and O'Leary (1995)
Purchase intention	Probability, likelihood, and willingness to purchase the product	Burton et al. (1999); Grewal et al. (1998)

Each belief construct was computed based on the method provided in the theory of planned behavior. In the TPB, attitude (A) is a function of is the belief b_i (subjective probability) that behavior will results in consequence *i,* and e_i is the evaluation or desirability of consequence *i*:

$$A \propto \sum_i b_i e_i$$

Subjective norm (S) is a function of the individual's informational interpersonal belief (n_j) concerning individual or group *j* and the individual's motivation to comply (m_j) with *j*:

$$S \propto \sum_j n_j m_j$$

The perceived behavioral control (PBC) is also a function of control beliefs and importance over the controls, as formulated below:

$$PBC \propto \sum c_k p_k$$

where c_k and p_k represent control belief about and perceived power over control *k,* respectively.

Appendix B
Questionnaire Items

We used 0-10 bipolar scale to measure each construct.

Perceived Price and Evaluation	
pb_1:	Buying the product on this website save me money (0-does not save me money to 10-save me money).
pe_1:	*Saving money* in the purchase of the product on the web is (bad/good)
pb_2:	*Price comparison* for the product was provided
pe_2:	*Having comparative price information* from other websites is (bad/good)
Perceived Service and Evaluation	
sb_1:	*Guarantee of the product quality* existed
se_1:	Expecting the website to *guarantee the quality* of the product is (bad/good)
sb_2:	The evidence that the seller is *behind its product* existed
se_2:	Expecting the website to *stand behind its product* is (bad/good)
sb_3:	The evidence that it will be *dependable* when customers have problems was provided
se_3:	Expecting the website to be dependable when customers have problems is (bad/good)
Informational Beliefs and Motivation	
nb_1:	The *customers' rating* of the product provided valuable information.
nm_1:	Seeing *other peoples' rating* of the product is (not important/important)
nb_2:	The *comments* by *other buyers* of the product provided valuable information.
nm_2:	Reading *other buyers' comments* about the product is (not important/important)
nb_3:	The *comments* from *product experts* were valuable information.
nm_3:	Reading the *product experts'* opinion is (not important/important)
nb_4:	The *sales ranking* of the product was valuable information
nm_4:	Seeing *sales ranking* of the product is (not important/important)
Perceived Self-Efficacy and its Power	
seb_1:	Purchasing process of the product was easy
sep_1:	For me, *ease of purchasing* the product is (not important/important)
seb_2:	The process of buying the product was straightforward
sep_2:	For me, *the straightforward nature of purchase process* in buying the product is (not important/important)
seb_3:	Buying the product required a great deal of effort
sep_3:	For me, not spending *too much effort* in buying the product is (not important/important)
Perceived Resource Facilitation and its Power	
rfb_1:	The amount of *product information* I had in making my purchase decision was enough
rfp_1:	For me, having enough *product information* is (not important/important)
rfb_2:	I had *a clear idea* about the product
rfp_2:	For me, having *clear idea* about product is (not important/important)
rfb_3:	The *nature* of the product was clear
rfp_3:	For me, being *clear about the nature* of the product is (not important/important)

rfb_4:	I was *able to test* the product adequately
rfp_4:	For me, being able to *adequately test* the product is (not important/important)
rfb_5:	I *knew* enough about the *details* of the product
rfp_5:	For me, knowing the *details* of product is (not important/important)
rfb_6:	I could *easily visualize what* the product actually looks like
rfp_6:	For me, *being able to easily visualize* the product is (not important/important)
Attitude	
a_1:	Buying the product on this website makes me feel (bad/good)
a_2:	If I buy the product on this website, I would feel that I am getting a (bad/good) deal
a_3:	Buying the product on this website is a (bad/good) idea
a_r:	Buying the product on this website is a (foolish/wise) idea
a_5:	Buying the product on this website would be (unpleasant/pleasant)
Subjective Norm	
sn_1:	Other people on whose *comments* I rely for purchase information have provided supporting evidence
sn_2:	Other people on whose *ratings* I rely for purchase information have provided supporting evidence
sn_3:	Experts on whose *opinion* I rely for purchase information have provided supporting evidence
sn_4:	The *sales ranking* of the product on which I rely for purchase information has provided supporting evidence
Perceived Behavioral Control	
pbc_1:	The *extent of knowledge* that I feel I have in making my purchase decision is sufficient
pbc_2:	The *extent of control* that I feel I have in making my purchase decision is sufficient
pbc_3:	The *extent of resources* that I feel I have at my disposal in making my purchase decision is sufficient
pbc_4:	The *extent of self-confidence* that I feel I have in making my purchase decision is sufficient
Purchase Intention	
pi_1:	The *probability of buying* the product on this website would be probable
pi_2:	The *likelihood* that I would purchase the product is highly likely.
pi_3:	My *willingness to buy* the product is highly willing
pi_4:	The probability that I would *consider buying* the product is highly probable

Appendix C

Table C-1. Cronbach Alpha for the Constructs

Constructs	# Item	Cronbach Alpha
Perceived price	2 (PBE1–PBE2)	0.7386
Perceived service	3 (SBE1–SBE3)	0.8773
Informational interpersonal influence	4 (NBM1–NBM4)	0.9360
Perceived self-efficacy	3 (SBP1–SBP3)	0.8439
Perceived resource facilitation	6 (RBP1–RBP6)	0.9420
Attitude	5 (A1–A5)	0.9723
Subjective norm	4 (SN1–SN4)	0.9739
Perceived behavioral control	4 (PBC1–PBC4)	0.9574
Purchase intention	4(PI1–PI4)	0.9770

Table C-2. Factor Loadings for Model Constructs

Beliefs Constructs						
Constructs	**Item No**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Perceived price	PBE1	0.1199	0.0495	0.1198	0.1320	**0.8644**
	PBE2	0.0824	0.0711	0.0487	0.0670	**0.8932**
Perceived service	SBE1	0.1238	0.0651	**0.8799**	0.0660	0.0330
	SBE2	0.1297	0.1231	**0.8829**	0.1250	0.1061
	SBE3	0.1796	0.1068	**0.8500**	0.1132	0.0610
Informational interpersonal influence	NBM1	0.0564	**0.9455**	0.0664	0.0324	0.0404
	NBM2	0.0668	**0.9492**	0.0798	0.0389	0.0268
	NBM3	0.1176	**0.9103**	0.0723	0.0538	0.0300
	NBM4	0.0973	**0.8188**	0.0996	0.0250	0.0606
Perceived self-efficacy	SBP1	0.1512	0.0240	0.1444	**0.8546**	0.0500
	SBP2	0.2312	0.0560	0.0959	**0.8411**	0.0932
	SBP3	0.0813	0.0475	0.0570	**0.8484**	0.0827
Perceived resource facilitation	RBP1	**0.8514**	0.1218	0.1427	0.1129	0.0882
	RBP2	**0.8873**	0.0828	0.1102	0.1711	0.0775
	RBP3	**0.8167**	0.0958	0.1044	0.2066	0.1100
	RBP4	**0.8282**	0.0637	0.1101	0.0129	0.0171
	RBP5	**0.9123**	0.0555	0.0688	0.1110	0.0441
	RBP6	**0.8889**	0.0273	0.0798	0.0662	0.0215
Cumulative variance explained		0.3377	0.5075	0.6279	0.7241	0.8009

Attitude, Subjective Norm, and Perceived Behavioral Control Constructs				
Constructs	Item No	Factor 1	Factor 2	Factor 3
Attitude	A1	**0.8926**	0.1559	0.2331
	A2	**0.9177**	0.1084	0.1692
	A3	**0.8993**	0.1687	0.2963
	A4	**0.8992**	0.1691	0.2998
	A5	**0.9011**	0.1585	0.2633
Subjective norm	SN1	0.1536	**0.9487**	0.1451
	SN2	0.1480	**0.9552**	0.1456
	SN3	0.1465	**0.9507**	0.1489
	SN4	0.1545	**0.8991**	0.1767
Perceived behavioral control	PBC1	0.2367	0.1831	**0.8972**
	PBC2	0.3027	0.1364	**0.8670**
	PBC3	0.2353	0.1811	**0.8962**
	PBC4	0.2947	0.1534	**0.8913**
Cumulative variance explained		0.5627	0.7697	0.9062

Purchase Intention Construct		
Construct	Item No	Factor 1
Purchase intention	PI1	**0.9672**
	PI2	**0.9761**
	PI3	**0.9698**
	PI4	**0.9577**
Variance Explained		0.9356

Table C-3. Correlations between Constructs and their Overall Questions

Construct (# of items)	Correlation (P-value)
Perceived price (2)	0.802 (0.000)
Perceived service (3)	0.803 (0.000)
Informational interpersonal influence (4)	0.902 (0.000)
Self-efficacy (3)	0.614 (0.000)
Resource facilitation (6)	0.889 (0.000)
Attitude (5)	0.918 (0.000)
Subjective norm (4)	0.964 (0.000)
Perceived behavioral control (4)	0.933 (0.000)
Purchase intention (4)	0.933 (0.000)