

## The roles of habit and web site quality in e-commerce

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### **Abstract:**

Previous research has primarily examined consumers' perceived usefulness of web sites and trust in the web retailer as two major predictors of web site use and e-commerce adoption. While the consumers' repeated behavior in the past (i.e., habit) may contribute to continuance behavior, it has not been investigated. This article includes habit as a primary construct along with perceived usefulness and trust to predict and explain consumers' continued behavior of using a B2C web site. Additionally, included are several web quality measures as antecedents to trust and perceived usefulness. The research model is evaluated using structural equation modeling. Results show that consumers' behavioral intentions to continue using a B2C web site are determined by all three key drivers: perceived usefulness, trust, and habit. Furthermore, not all dimensions of web quality have a significant effect on perceived usefulness and trust.

**Keywords:** Electronic commerce; Web site quality; Trust; Perceived usefulness; Habit

### **Article:**

#### ***1. Introduction***

In e-commerce, the cost of obtaining and retaining a customer is usually higher than through the traditional retail channel (Reichheld & Scheffer, 2000) and the customer's loyalty is relatively lower (Turban, Lee, King, & Chung, 2000). The retention of customers and the continued use of a web site are important challenges for web retailers. In this article, we focus on the factors that influence the continued use of a web site. Two constructs have been used in prior research on web sites' continued use/continuance intention: perceived usefulness and trust. The concept of perceived usefulness comes from the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) and the usefulness-intention association has been examined empirically in IS use research (e.g., Bhattacharjee, 2001; Gefen, 2003; Gefen, Karahanna, & Straub, 2003; Lin, Wu, & Tsai, 2005). Trust is another factor that has been investigated. For economic and social interactions where uncertainty is present, people adopt trust as a central complexity reduction strategy (Gefen et al., 2003; Pavlou, 2003), especially in the Internet-based e-commerce environment. The spatial and temporal separation between consumers and web retailers and the open structure of the Internet imply that more uncertainty and higher risk are present (Pavlou, 2003), and the role of trust becomes paramount. The web retailer not only cultivates initial consumer trust actively (Mcknight, Choudhury, & Kacmar, 2002b) but also maintains and constantly rebuilds consumer trust (Gefen et al., 2003).

We add the construct of "habit" to the above two constructs. In past research about repeated behaviors (Chaudhuri, 1999; Gefen, 2003; Limayem & Hirt, 2003; Ouellette & Wood, 1998; Trafimow, 2000; Triandis, 1971), the role of habit in predicting behavior has been verified. Habit reflects automatic behavior tendencies developed during the past history of the individual (Limayem & Hirt, 2003). When behavior is repeated and becomes habitual, it is guided by automated cognitive processes, rather than by elaborate decision processes (Aarts, Verplanken, & van Knippenberg, 1998). Thus examining the effect of habit on behavioral continuance can improve our understanding of e-commerce and web site adoption.

In most cases in B2C, the only interface between the customer and the retailer is the web site. The site is the primary influence on user perceptions. Thus the web site quality will affect customer's perceived usefulness of the site and trust in the retailer. Yet these relationships are not well understood. For example, Gehrke and Turban (1999) argue that effective guidelines for constructing and managing websites are lacking. Therefore, we examine various quality attributes of web sites, such as appearance, content quality, specific content, and technical features, which in turn would impact perceived usefulness and trust.

## **2. Theoretical background and central constructs**

### ***2.1. Perceived usefulness and behavioral intentions to use***

Perceived usefulness is an important predictor of initial intentions to use information systems (Davis, 1989; Davis et al., 1989) and of intentions for continued use (Bhattacharjee, 2001). Following Davis (1989), perceived usefulness is defined as the degree to which a consumer believes that using a particular web site will increase performance in purchasing and information searching. Although TAM posits that perceived ease of use is another determinant, Karahanna, Straub, and Chervany (1999) and Taylor and Todd (1995) found that perceived ease of use has no significant effect on behavioral intentions to use for experienced IT users. Perceived ease of use usually is shown as an important predictor for potential adopters of systems, because it reflects users' computer self-efficacy when they adopt a new system (Davis, 1989). The more users use the system, the more they understand about the operation of the system. When users gain experience, the effect of perceived ease of use is eliminated and users pay more attention to enhanced job performance from continued use (Karahanna et al., 1999). The same perspective was adopted by Bhattacharjee (2001) to develop a post-acceptance model of IS continuance. As we explore experienced online consumers' continued behavior, only the perceived usefulness construct is considered.

### ***2.2. The importance of trust in e-commerce***

The concept of trust has been viewed at different levels (Gefen et al., 2003). We look at trust between customers and web retailers in consumer-based e-commerce. Following Pavlou's (2003) work, trust in B2C e-commerce is defined as the belief that allows consumers to willingly become vulnerable to web retailers after having taken the retailers' characteristics into consideration. As in previous studies (Bhattacharjee, 2002; Mayer, Davis, & Schoorman, 1995; Mcknight, Choudhury, & Kacmar, 2002a; Suh & Han, 2003), trust is regarded as a salient belief that includes integrity, benevolence, and ability.

The importance of trust is elevated in the highly uncertain e-commerce environment (Pavlou, 2003). Consumers find it difficult to assess whether the retailer will deliver on its commitments or protect the privacy of personal information (Mcknight et al., 2002b). Moreover, the unpredictability of the Internet infrastructure increases consumers' fears that hackers or the third party will threaten their financial secrets or disclose personal information (Hoffman, Novak, & Peralta, 1999; Pavlou, 2003). These concerns increase their perceived risk of online transactions (Pavlou, 2003). Trust helps consumers overcome perceptions of risk (Mayer et al., 1995; Pavlou, 2003) and provides expectations of successful transactions (Schurr & Ozanne, 1985).

### ***2.3. Habit***

According to various interpretations in the literature, habits have the following characteristics: (1) habits require learning (Verplanken, Aarts, van Knippenberg, & Moonen, 1998); (2) habits are automatic responses to specific situations or stimuli, and are always limited in scope (Aarts et al., 1998; Limayem & Hirt, 2003; Ouellette & Wood, 1998; Verplanken et al., 1998); (3) habits emerge from response repetition (Ouellette & Wood, 1998); (4) habitual responses are automatic in the sense that they can be performed quickly in parallel with other activities and with allocation of minimal attention (Ouellette & Wood, 1998); and (5) habits reflect automatic behavior tendencies developed during the past history of the individual (Limayem & Hirt, 2003; Ouellette & Wood, 1998). Gefen (2003) made the point that continued use or intention is not the same as habit. Habit is what one usually does; it is a behavioral preference in the present, whereas intended use indicates the specific behavioral intention referring to future activities. Most habitual behavior arises and proceeds efficiently, effortlessly, and unconsciously (Aarts et al., 1998). Habit has been verified as an antecedent of behavioral intentions. For example, compared with theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), habit

affects behavioral intention beyond what attitude and social norms can (Leone, Perugini, & Ercolani, 1999; Trafimow, 2000; Triandis, 1971; Verplanken et al., 1998). Habit even increases the continuance of existing behavior (Campbell & Cochrane, 1999; Ouellette & Wood, 1998).

### 2.4. User-perceived web quality

The design of web sites plays an important role in attracting and keeping customers. A high-quality website not only affects the customer’s purchase decision (Liang & Lai, 2002) but also is one of the main reasons for consumers to determine whether they will purchase online or not (Gehrke & Turban, 1999). Poor quality web sites can result in loss of customers to competitors, escalation of costs, and reduction in profits. Therefore, it is necessary to understand how web quality affects consumers’ beliefs about the web site, which in turn leads to behavioral intention to use. Although several studies on web quality exist, the linkage from quality to beliefs is not clearly understood.

### 3. Research model and hypotheses

Fig. 1 shows the research model. The context of the entire model is B2C e-commerce. User-perceived web quality and habit are modeled as exogenous variables, while perceived usefulness and trust are modeled as mediators between the exogenous variables and the consumer’s behavioral intention to continue using the web site. The model has eight hypotheses. Each is listed with arguments and justification.

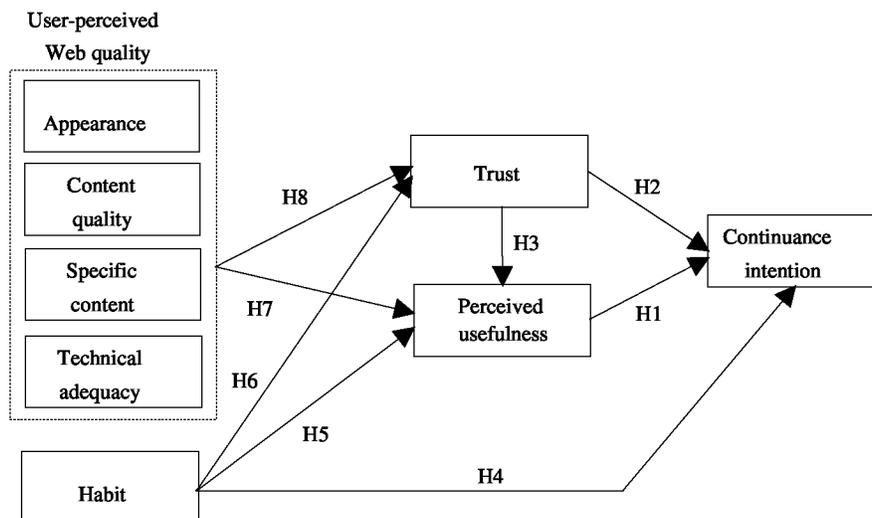


Fig. 1. Research model.

The more useful the web site is in enabling the users to accomplish their tasks, the more it is likely to be used. This is the users’ rational reaction when they elect to use a web site (Gefen, 2003). Bhattacharjee (2001) indicated that the usefulness–intention association originally derived in an acceptance context still holds true in continuance contexts, because human tendencies for subconsciously pursuing instrumental behaviors are independent of the timing or stage of such behaviors. Thus,

H1 The perceived usefulness of a web site will positively affect users’ intentions to continue using it. In Internet-based e-commerce lacking effective regulation or compliance, consumers must assume that a web retailer’s ethic complies with business norms in order to have trust to transact with the Web retailer. Trust reduces behavioral uncertainty related to the actions of the web retailer, giving the consumer a perception of some control over a potentially uncertain transaction (Pavlou, 2003), encouraging future transactions (Bhattacharjee, 2002; Gefen et al., 2003), and helping build long-term relationships (Bhattacharjee, 2002). Thus,

H2 Trust in the web retailer will positively affect users’ intentions to continue using its web site. Trust can increase the perceived usefulness of the interaction with the web site by increasing the ultimate benefits received from an honest, caring, and able web retailer, as expected (Gefen et al., 2003). If the web retailer is not worthy of consumers’ trust, consumers may suffer a loss from the transaction when the retailer

behaves opportunistically (Pavlou, 2003). Thus trust increases the likelihood that consumers will gain the expected benefits from the web site (Gefen et al., 2003). Therefore:

H3 Trust in the web retailer will positively affect user's perceived usefulness of its web site.

Habit can predict one's future behavior (Bamberg, Ajzen, & Schmidt, 2003). When behavior has been performed many times in the past, subsequent behavior increasingly becomes under the control of an automated cognitive process (Aarts et al., 1998). People are likely to form favorable intentions about acts they have frequently performed in the past (Ouellette & Wood, 1998). When habit is strong, people rely much more on habit than they do on external information and on choice strategies (Gefen, 2003). Therefore, once the use of a specific web site becomes routine, habit should become an additional force that increases the behavioral intention to continue using the web site.

H4 Habitual activity with a web site will positively affect user's intention to continue using the web site. Gefen (2003) argued that through habitual prior use of a specific information technology and the knowledge that is gained by doing so, users should learn more about the technology, including how to operate it and how to gain more advantage. Such increased understanding should result in a greater awareness among the users of its potential usefulness. Karahanna et al. (1999) also found that experienced users of an IT can perceive more usefulness of the technology than those users with limited experience.

H5 Habitual activity with a web site will positively affect users' perceived usefulness of a web site. Satisfactory experiences enhance the tendency to repeat the same behavior (Aarts et al., 1998). Once a behavior becomes a habit, it implies a well-practised behavior (Ouellette & Wood, 1998). Consumers trust the web retailer based on a history of previous interactions and positive experiences in which the web retailer did not deceive them, which are the subjective reasons for trust (Tan & Thoen, 2000). Moreover, through habitual use of a web site and the knowledge gained by doing so, users should increase their understanding of the web site (Gefen, 2003) and should become more familiar with the web retailer. Therefore, they can anticipate the outcomes and are more likely to trust the web retailer.

H6 Habitual activity with a web site will positively affect user's trust in the web retailer.

Several elements of web quality, such as information quality (Lederer, Maupin, Sena, & Zhuang, 2000; Lin & Lu, 2000), response time (Lin & Lu, 2000), visual attractiveness (Heijden, 2003) have been verified to be related to perceived usefulness. Saeed, Hwang, and Yi (2003) have proposed that system quality, information quality, and service quality are important drivers of consumer perceptions and subsequent online behavior. At the same time, if consumers perceive that the web site is of high quality, they are likely to have high trusting beliefs about the web retailer's competence, integrity, and benevolence; and will develop a willingness to depend on the web retailer (Mcknight et al., 2002a). Thus,

H7 The user-perceived web site quality will positively affect the perceived usefulness of the web site.

H8 The user-perceived web site quality will positively affect the user's trust in the web retailer.

There are several elements of web quality. We adopt the quality construct and its four dimensions proposed and validated by Aladwani and Palvia (2002). The four dimensions are: appearance, content quality, specific content, and technical adequacy. The relationships between each dimension and the two beliefs of perceived usefulness and trust will be examined below.

Appearance refers to the visual attractiveness of a web site. Colors, fonts, and multimedia features as well as an appropriate overall layout can increase the aesthetics and visual attractiveness of the site (Ranganathan & Ganapathy, 2002), in turn affecting the perception of its usefulness (Heijden, 2003). Tractinsky, Katz, and Ikar (2000) found that perceived usefulness and perceived aesthetics of a system are related to each other.

Individuals assess a site by observing and attending to cues that might confirm the person's trustworthiness (Gefen et al., 2003). Appearance of the site is an obvious cue by which consumers can assess a retailer's trustworthiness. If a site is aesthetically pleasing, well-organized and attractive, consumers will deem that the retailer is willing to invest in establishing and maintaining a relationship with them and regard the web retailer as trustworthy.

H7a. The appearance of a web site will positively affect the user's perception of its usefulness. H8a. The appearance of a web site will positively affect the users' trust in the web retailer.

Content quality deals with attributes such as information usefulness, completeness, accuracy, and so forth, and is similar to the "information quality" concept discussed extensively in the literature. Information quality and usefulness are highly related with each other (DeLone & McLean, 1992; Seddon, 1997). Past studies have corroborated this association (Lederer et al., 2000; Lin & Lu, 2000; Rai, Lang, & Welker, 2002). Regarding trust, it disappears rapidly when consumers perceive that information available on the web site is not reliable (Mcknight, Cummings, & Chervany, 1998). If the information provided by the web retailer is ambiguous, inaccurate, or incomplete, it will cause doubts in the consumer's mind about the retailer engaging in harmful opportunistic behaviors and reduce trust. On the contrary, providing high content quality on the web site will increase trust.

H7b. The content quality of a web site will positively affect the user's perception of its usefulness. H8b. The content quality of a web site will positively affect the users' trust in the web retailer.

Specific content refers to finding specific details about product/services, customer support, privacy policies, and other important information (Aladwani & Palvia, 2002). These items of information are directly related to consumers and can affect users' perceived usefulness of the web site (DeLone & McLean, 1992; Lederer et al., 2000; Lin & Lu, 2000; Saeed et al., 2003; Seddon, 1997). For example, a growing number of Internet users have expressed concerns over potential misuse of personal information. Privacy concerns have become a major barrier in online shopping (Ranganathan & Ganapathy, 2002). Therefore, developing and displaying consumer privacy policies and providing relevant product/service details will increase consumers' trust in the web retailer (Tan & Thoen, 2000; Yoon, 2002).

H7c. Specific content in a web site will positively affect the user's perception of its usefulness. H8c. Specific content in a web site will positively affect the user's trust in the web retailer.

Technical adequacy means that appropriate technologies have been adopted by the web retailer, and is similar to the "system quality" concept discussed in the literature. Adopting such technologies can improve the security of online transactions and contribute to convenience of usage. Davis et al. (1989) argue that system characteristics affect intended use through perceived usefulness. DeLone and McLean (1992) proposed that system quality affects perceived usefulness, which was later verified by Seddon (1997) and Rai et al. (2002). We contend that adopting adequate technologies will increase customers' confidence in the retailer and lead to enhanced trust. Gefen et al. (2003) argue that web retailers should be providing excellent security in order to extend customer trust. Customers are likely to regard the web retailer as sincere and benevolent when they perceive that the retailer is willing to invest in technological capabilities.

H7d. Technical adequacy of the web site will positively affect the user's perception of its usefulness.

H8d. Technical adequacy of the web site will positively affect the user's trust in the web retailer.

## **4. Research methodology**

### ***4.1. Instrument development***

Scales measuring the constructs were based on previous studies whenever possible. Scales for perceived usefulness were adapted from existing studies on technology acceptance (Davis, 1989; Gefen et al., 2003).

Measures for trust were adapted from [Bhattacharjee \(2002\)](#). Measures for habit were adapted from [Gefen \(2003\)](#). User-perceived web quality scales were adapted from [Aladwani and Palvia \(2002\)](#). [Pavlou \(2003\)](#) argued that consumers view the transaction process in its entirety, both as intention to use (information exchange) and intention to transact (product purchase). Following his work, the dependent variable measuring continuance intention was captured with three items, two measuring intention to use (information exchange), and one measuring intention to transact (product purchase). All items were measured on a 7-point Likert scale with anchors of strongly disagree (1) to strongly agree (7).

The preliminary instrument was reviewed by five consumers with more than 3 years of online shopping experience, three doctoral students, and one researcher for precision and clearness. Next, pre-testing to check the psychometric properties of the scales was undertaken by 47 MBA students experienced in online shopping. The participants were asked to choose their favorite web site and state the name of the web retailer, and then asked to indicate how much they agreed to the various statements about the site. Choosing a favorite web site/retailer provides context and a natural scenario, and was proposed by [Pavlou \(2003\)](#). Of the 47 questionnaires, 7 were discarded due to missing values. Twenty four of the 40 respondents had online shopping experience of more than 1 year. The Cronbach's alpha ( $\alpha$ ) coefficients of all constructs were above 0.85 and acceptable ([Nunnally, 1978](#)).

#### 4.2. Subjects

A mail survey was conducted in Taiwan. The study focused on experienced online shoppers who have bought products/services online. According a survey by [Yam.com](#), a popular portal site in Taiwan, college students and salaried employees in Taiwan are major Internet users. Therefore, subjects were undergraduate and graduate students, and company employees. We chose 47 companies in which students work, and asked these students to distribute and collect the questionnaires. To reduce possible bias in convenience sampling, we chose different kinds of companies and distributed 10–20 questionnaires in accordance with company size. Students from three universities were also asked to complete the survey. As in the pre-test, participants were asked to name their favorite web retailer, and then answer the questions in that context.

Table 1  
Respondent demographic information

Variable	Frequency	Percentage
<i>Age</i>		
Under 20	80	17.9
20–29	205	46.0
30–39	126	28.3
40–49	29	6.5
Over 50	6	1.3
<i>Gender</i>		
Male	199	44.6
Female	247	55.4
<i>Education</i>		
High school or less	36	8.1
Some college	121	27.1
Bachelor's degree	213	47.8
Graduate degree	76	17.0
<i>Degree of online shopping experiences</i>		
< 1 year	167	37.4
> 1 year	279	62.6
<i>Industries</i>		
Manufacturing	115	25.8
Service	91	20.4
Culture and education	46	10.3
Financial sector	33	7.4
Student	135	30.3
Others	26	5.8

A total of 862 questionnaires were distributed. One hundred and seventy nine were distributed to students and 145 were collected. Six hundred and eighty three were distributed to company employees and 432 were collected. After discarding incomplete responses, 446 usable questionnaires (135 students and 311 employees) were received and used for analysis, resulting in a response rate of 51.7%. Data were pooled from these two samples. Pooling was justified as there were no significant differences between the two samples in the answers to items measuring key-dependent and -independent variables (Wilks'  $\lambda = 0.98$ ,  $p$ -value = 0.352). The non-response bias was assessed by comparing the early company respondents (65%) with late respondents (35%) (Armstrong & Overton, 1977). Multivariate analysis of variance on key constructs showed no significant differences (Wilks'  $\lambda = 0.984$ ,  $p$ -value = 0.78). Thus, the risk of non-response bias is limited. Table 1 summarizes some of the demographics of the respondents.

## 5. Analysis and results

Structural equation modeling (SEM) was used to validate the research model. Following Anderson and Gerbing's (1988) guidelines, data analysis was carried out with a two-stage methodology. First, we performed confirmatory factor analysis (CFA) to evaluate the convergent and discriminant validity of the constructs. Next, the causal structure of the proposed research model was tested. LISREL 8.50 was used to perform these analyses.

Table 2  
Fit indices for measurement and structural models

Fit indices	Recommended value	Measurement model	Structural model
Chi-square ( $\chi^2$ )	$p > 0.05$ (Hair et al., 1998)	1805.04 ( $p = 0.00$ )	1814.08 ( $p = 0.0$ )
Chi-square/degrees freedom ( $\chi^2/df$ )	$< 5.00$ (Hair et al., 1998)	2.17 (df = 832)	2.17 (df = 836)
Root Mean Square Error of Approximation (RMSEA)	$< 0.08$ (Hair et al., 1998)	0.053	0.0534
Root Mean square Residual (RMR)	$< 0.05$ (Gefen, Straub, & Boudreau, 2000)	0.042	0.0426
Goodness-of-Fit Index (GFI)	$> 0.90$ (Gefen, Straub, & Boudreau, 2000)	0.84	0.835
Adjusted Goodness-of-Fit Index (AGFI)	$> 0.80$ (Gefen et al., 2000)	0.81	0.813
Non-Normed Fit Index (NNFI)	$> 0.90$ (Hair et al., 1998)	0.93	0.929
Comparative Fit Index (CFI)	$> 0.90$ (Gefen et al., 2000)	0.93	0.934

### 5.1. Measurement model

CFAs were employed to test the measurement model. Table 2 shows the overall model fit indices for CFA. It also shows the recommended value of each index. As shown, all measures satisfied the recommended values, except for the  $\chi^2$  and GFI. However, the  $\chi^2$  is sensitive to large sample sizes, especially for cases in which the size exceeds 200 respondents (Hair, Anderson, Tatham, & Black, 1998). It was therefore necessary to complement the  $\chi^2$  with other goodness-of-fit measures (Hair et al., 1998). The GFI at 0.84 was slightly below the 0.9 benchmark, but it exceeds the recommended value of 0.80 suggested by Etezadi-Amoli and Farhoomand (1996). One may conclude that the index is marginally acceptable (Suh & Han, 2003). Therefore, there is a reasonable overall fit between the model and the observed data.

After the overall model was accepted, each construct was evaluated separately by examining the indicator loadings for statistical significance and assessing the construct's reliability, and variance extracted (Hair et al., 1998). The results as well as the recommended values for the measures (Hair et al., 1998) are shown in Table 3. All measures satisfy the recommended values. The results demonstrate convergent validity. Additionally, discriminant validity is shown when the square root of each construct's average variance extracted (AVE) is larger than its correlations with other constructs. As shown in Table 4, the square root of the AVE is much larger than its correlations with other constructs. To further assess discriminant validity, the  $\chi^2$  difference test can be performed (Bagozzi & Phillips, 1982) by comparing the  $\chi^2$  statistic of the unconstrained CFA model (with all constructs freely correlated) with that of a constrained model (with covariance between two constructs set equal to 1). A significant  $\chi^2$  difference indicates discriminant validity between the constrained pair of constructs. As shown in Table 5, the  $\chi^2$  differences ranged between 376.83 and 1006.34 ( $p < 0.001$ ), demonstrating adequate discriminant validity for all scales.

Table 3  
Measurement model fit indices for convergent validity

Construct	Standardized item loadings <sup>a</sup>	Item reliability	Composite reliability	Variance extracted
Recommended value		> 0.50	> 0.70	> 0.50
<b>Appearance</b>			0.90	0.65
Attractiveness	0.72	0.52		
Organization	0.79	0.63		
Proper use of fonts	0.89	0.79		
Proper use of colors	0.87	0.76		
Proper use of multimedia	0.73	0.53		
<b>Content quality</b>			0.92	0.67
Usefulness	0.78	0.61		
Completeness	0.86	0.74		
Clarity	0.87	0.75		
Currency	0.78	0.61		
Conciseness	0.78	0.61		
Accuracy	0.83	0.69		
<b>Specific content</b>			0.89	0.61
Finding contact information	0.72	0.52		
Finding firm general information	0.71	0.51		
Finding products/services details	0.85	0.72		
Finding customers' policies (e.g., dispute policies)	0.82	0.66		
Finding customer support	0.81	0.66		
<b>Technical adequacy</b>			0.92	0.55
Security	0.72	0.51		
Ease of navigation	0.75	0.57		
Search facilities	0.75	0.56		
Availability	0.73	0.54		
Valid links	0.76	0.58		
Personalization or customization	0.71	0.51		
Speed of page loading	0.73	0.53		
Interactivity	0.78	0.62		
Ease of accessing the site	0.72	0.51		
<b>Habit</b>			0.89	0.68
This is where I usually go to seek product information and purchase	0.89	0.79		
This is my preferred web retailer	0.89	0.79		
When I need to seek product information and purchase online, this is where I go first	0.74	0.54		
I often seek product information and purchase online from this web retailer	0.76	0.58		

Table 3 (continued)

Construct	Standardized item loadings <sup>a</sup>	Item reliability	Composite reliability	Variance extracted
Recommended value		> 0.50	> 0.70	> 0.50
<b>Perceived usefulness</b>			0.89	0.67
The web site improves my performance in information seeking and purchasing	0.80	0.64		
The web site enables me to seek and purchase faster	0.80	0.64		
The web site enhances my effectiveness in information seeking and purchasing	0.86	0.73		
The web site increases my productivity in information seeking and purchasing	0.81	0.66		
<b>Trust</b>			0.94	0.68
Expertise	0.81	0.65		
Information	0.83	0.68		
Fairness in transactions	0.83	0.69		
Fairness in service	0.85	0.72		
Empathy	0.80	0.64		
Resolving concerns	0.80	0.65		
Overall trust	0.85	0.73		
<b>Continuance intention</b>			0.92	0.79
I intend to continue using the web site in the future	0.92	0.84		
I expect my use of the web site to continue in the future	0.91	0.82		
It is likely that I will continue to transact with the web retailer in the near future	0.84	0.70		

<sup>a</sup>All indicator loadings are significant at  $p = 0.001$ .

Table 4  
Inter-construct correlations (diagonal elements show the square root of the AVE)

	Appearance	Content quality	Specific content	Technical adequacy	Habit	Perceived usefulness	Trust	Continuance intention
Appearance	0.806							
Content quality	0.672	0.819						
Specific content	0.472	0.535	0.781					
Technical adequacy	0.629	0.682	0.678	0.742				
Habit	0.507	0.493	0.422	0.565	0.825			
Perceived usefulness	0.584	0.61	0.486	0.66	0.619	0.819		
Trust	0.507	0.587	0.585	0.702	0.546	0.675	0.825	
Continuance intention	0.534	0.497	0.442	0.585	0.624	0.642	0.635	0.889

## 5.2. Structural model

Having satisfied measurement requirements, we performed structural equation analysis to test the structural relationships. As seen in Table 2, the results showed that the  $\chi^2$  statistic is significant ( $\chi^2 = 1814.08, p = 0.0$ ), GFI at 0.835 is marginally acceptable, and the other fit indices are within accepted thresholds:  $\chi^2/df$  at 2.17 (df = 836), RMSEA at 0.0534, RMR at 0.0426, AGFI at 0.813, NNFI at 0.929, CFI at 0.934. Fig. 2 shows the standardized LISREL path coefficients. All paths are significant except the path between specific content and perceived usefulness ( $\gamma = -0.094, t = -1.55$ ), and between appearance and trust ( $\gamma = -0.055, t = -0.85$ ), which are insignificant. The Modification Indices (MI) of LISREL report shows that the proposed model does not need to be further modified. The extent of explained variance of continuance intention was 62%, which demonstrates a better result compared with similar research in e-commerce (Bhattacharjee, 2001; Gefen, 2003; Gefen et al., 2003; Lin et al., 2005). The extent of explained variance of trust was 62%, and of perceived usefulness 70%.

Table 5  
 $\chi^2$ -tests of discriminant validity

Variables constrained	$\chi^2$	Degrees of freedom	$\chi^2$ difference <sup>a</sup>
None	1805.04	832	—
A + CQ	2326.44	833	521.40
A + SC	2595.52	833	790.48
A + TA	2391.81	833	586.77
A + H	2478.85	833	673.81
A + PU	2329.48	833	524.44
A + T	2703.14	833	898.10
A + CI	2472.28	833	667.24
CQ + SC	2519.12	833	714.08
CQ + TA	2398.12	833	593.08
CQ + H	2539.47	833	734.43
CQ + PU	2304.69	833	499.65
CQ + T	2811.38	833	1006.34
CQ + CI	2537.43	833	732.39
SC + TA	2181.87	833	376.83
SC + H	2574.19	833	769.15
SC + PU	2441.51	833	636.47
SC + T	2435.24	833	630.20
SC + CI	2560.11	833	755.07
TA + H	2405.76	833	600.72
TA + PU	2194.38	833	389.34
TA + T	2399.19	833	594.15
TA + CI	2408.91	833	603.87
H + PU	2235.18	833	430.14
H + T	2471.72	833	666.68
H + CI	2293.50	833	488.46
PU + T	2202.05	833	397.01
PU + CI	2225.93	833	420.89
T + CI	2359.24	833	554.20

A = appearance, CQ = content quality, SC = specific content, TA = technical adequacy, H = habit, PU = perceived usefulness, T = trust, CI = continuance intention.

<sup>a</sup>All  $\chi^2$  differences are significant at  $p = 0.001$ .

Although we claim that habit has a positive impact on trust and perceived usefulness, some may argue the reverse and that trust and perceived usefulness lead to habit. To examine this possibility, we ran LISREL for the contrary hypotheses among perceived usefulness, trust and habit. The results  $\chi^2 = 1831.447$ ,  $p = 0.0$ ;  $\chi^2/df = 2.18$ ,  $df = 840$ ; RMSEA = 0.0538; RMR = 0.0466; GFI = 0.833; AGFI = 0.811; NNFI = 0.928; CFI = 0.933 show that our original model is the better one.

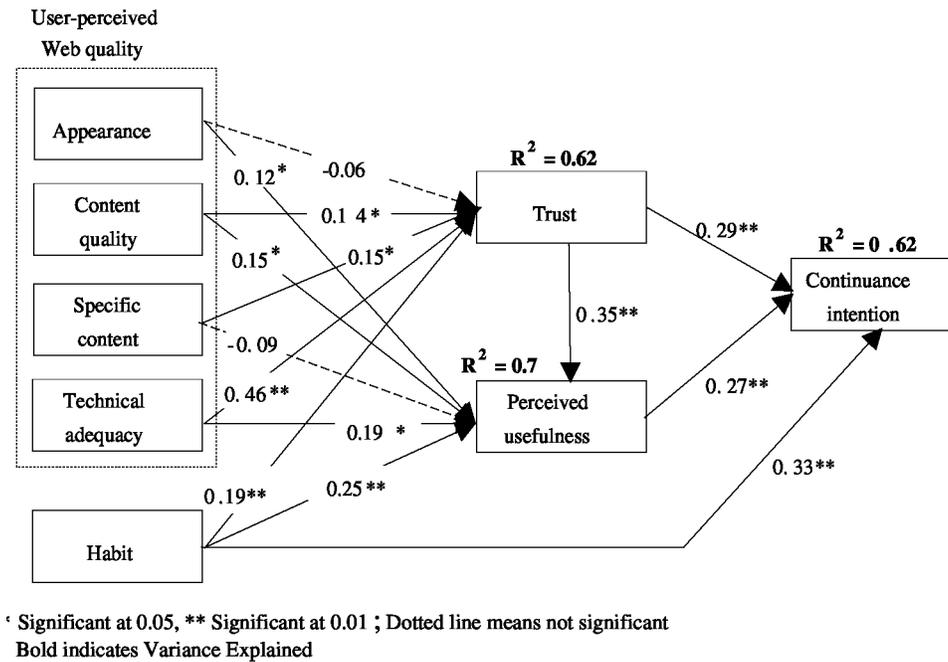


Fig. 2. Standardized LISREL solution.

### 5.3. Results

As shown in Fig. 2, perceived usefulness ( $\beta = 0.27$ ,  $p < 0.01$ ) and trust ( $\beta = 0.29$ ,  $p < 0.01$ ) are strong predictors of continuance intention. Therefore, H1 and H2 are supported. The effect of trust on perceived usefulness ( $\beta = 0.35$ ,  $p < 0.01$ ) was significant, validating H3. Habit was found to influence continuance intention ( $\beta = 0.33$ ,  $p < 0.01$ ), perceived usefulness ( $\beta = 0.25$ ,  $p < 0.01$ ), and trust ( $\beta = 0.19$ ,  $p < 0.01$ ) positively, thus validating H4, H5, and H6. User-perceived web quality was verified as an important exogenous variable, but not each dimension of web quality plays an equal role. The effect of appearance on perceived usefulness ( $\beta = 0.12$ ,  $p < 0.05$ ) was significant, validating H7a. However, the effect of appearance on trust was not supported, thus H8a is rejected. Content quality was found to influence perceived usefulness ( $\beta = 0.14$ ,  $p < 0.05$ ) and trust positively ( $\beta = 0.15$ ,  $p < 0.05$ ). Therefore, H7b and H8b are supported. The effect of specific content on usefulness ( $\beta = 0.15$ ,  $p < 0.05$ ) was significant, validating H8c. The specific content, however, has no significant impact on perceived usefulness, thus H7c cannot be supported. Technical adequacy was found to influence perceived usefulness ( $\beta = 0.19$ ,  $p < 0.05$ ) and trust ( $\beta = 0.46$ ,  $p < 0.01$ ) positively. Therefore, H7d and H8d were supported. It is noticeable that technical adequacy was the most influential predictor of trust compared with other dimensions of web quality. The hypothesis-testing results are summarized in Table 6.

## 6. Discussion and conclusions

### 6.1. Discussion

We first discuss the impacts of web quality. The result that the appearance dimension significantly affects user perception of usefulness is in agreement with Heijden's (2003) study, which targeted web portals. An aesthetic and attractive web site can enhance the user's perception of usefulness. Therefore, web retailers should stress the appearance related features in the design of web sites, e.g., the layout, use of colors, fonts, graphics, etc. However, the results show that appearance did not significantly contribute to user's trust. While the finding may be true and may need further validation, a possible explanation is that the subjects in this study were consumers who have had several purchase experiences with the target web site. On the contrary, a novice user can only depend on the external cues to assess the web retailers' trustworthiness (Mcknight et al., 1998), and the

appearance cue is quite an obvious one. Besides, the web sites chosen by respondents are popular and famous in Taiwan. Therefore, appearance may have no significant impact on trust for experienced online shoppers.

Table 6  
Hypothesis-testing results

Hypotheses	Remarks
H1. The perceived usefulness of a web site will positively affect users' intentions to continue using it.	Supported
H2. Trust in the web retailer will positively affect users' intentions to continue using its web site.	Supported
H3. Trust in the web retailer will positively affect user's perceived usefulness of its web site.	Supported
H4. Habitual previous activity with a web site will positively affect user's intention to continue using the web site.	Supported
H5. Habitual previous activity with a web site will positively affect users' perceived usefulness of a web site.	Supported
H6. Habitual previous activity with a web site will positively affect user's trust in the web retailer.	Supported
H7. The user-perceived web site quality will positively affect the perceived usefulness of the web site.	Partial supported
H7a. The appearance of a web site will positively affect the user's perception of its usefulness.	Supported
H7b. The content quality of a web site will positively affect the user's perception of its usefulness.	Supported
H7c. Specific content in a web site will positively affect the user's perception of its usefulness.	Not supported
H7d. Technical adequacy of the web site will positively affect the user's perception of its usefulness.	Supported
H8. The user-perceived web site quality will positively affect the user's trust in the web retailer.	Partial supported
H8a. The appearance of a web site will positively affect the users' trust in the web retailer.	Not supported
H8b. The content quality of a web site will positively affect the users' trust in the web retailer.	Supported
H8c. Specific content in a web site will positively affect the user's trust in the web retailer.	Supported
H8d. Technical adequacy of the web site will positively affect the user's trust in the web retailer.	Supported

The content quality of web sites can increase consumers' beliefs of perceived usefulness and trust. In online shopping, the consumers' decision-making process requires the scanning, filtering, collection, integration and comparison of information related to products and services (Cao, Gruca, & Klemz, 2003; Pavlou, 2003; Turban et al., 2000), which is important and time-consuming. If the web retailer cannot offer complete, clear, and current information, customers will give up buying or turn to a competitor. Furthermore, shopping from web sites is different from traditional brick-and-mortar stores. Customers are unable to touch, feel, and try products; therefore the need for clearer and detailed information is essential for decision-making. In light of these requirements, web retailers should not only create quality content but also actively maintain and improve the quality of their web sites.

Specific content dimension of web quality does not directly impact users' perceptions of usefulness, but it does directly affect the user's trust. Specific content affects perceived usefulness indirectly via trust. This is an important finding. In order to increase trust, all useful information relevant to consumers, especially information that is of particular concern to the consumer (i.e., contact information, customer policies, product/service details, after-sale support, etc.) should be completely and clearly demonstrated.

Adopting adequate technologies reflects the retailer's technological capability and facilitates convenience of using the web site, which in turn enhance the consumers' beliefs of trust and perceived usefulness. Interestingly, of all dimensions of web quality, technical adequacy had the most significant impact on trust. The clear implication is that the web retailer should continuously update technologies in order to provide the requisite functionality to the online shopper. A retailer with old and outdated technologies is likely to be regarded as less trustworthy.

The second focus of the article was the role of habit in e-commerce. Besides perceived usefulness and trust, which are considered major predictors of intention to use, a significant contribution of this research is that the consumer's habit was also verified to be a major predictor of intention. Habit is also an antecedent to trust which in turn is antecedent to perceived usefulness. The role of trust in continuance has been established in the literature; so we do not discuss it further. What is important is the role of habit, which has a direct linkage to continuance intention as well as mediated by perceived usefulness and trust. Thus the past behavior of a customer will have a large impact on their current assessment of whether to continue the behavior in the future.

## 6.2. Implications

Besides the quality issues discussed above, there are several practical implications of the impacts of habit. If a web retailer wants to attract consumers who have prior online shopping experience, they must change the

consumers' habit, which was cultivated elsewhere. For example, to overcome the force of habit, a web retailer may have to provide more favorable incentives and higher value than competitors do, and encourage consumers to revisit its web site. If the retailer can provide these and if the consumers can perceive the greater benefit, then they may alter their habit. Obviously, the bar is much higher for web retailers trying to attract new customers. Our findings also have implications beyond e-commerce. In interactions related to information systems and information technology, where there is inherently more uncertainty, habit may play a role. In general, when people repeatedly interact with specific entities, their perception of risk is diminished and there is no need to reassess (Gefen, 2003).

On the other hand, for existing customers, a web retailer should try to constantly strengthen their habitual use. Besides doing the best to maintain high customer satisfaction, it is necessary to actively reinforce the relationship with these customers. Frequent incentives, value added services, discounts, and personalized service are some of the measures to reinforce the customers' habit. If the retailer can maintain its existing customers, then it is a significant barrier for competitors to overcome.

Consumers also base their decisions on a large part on the usefulness of the site and the retailer's trustworthiness. Gefen (2003) argues that consumer will recalculate the benefits of using a web site when the habit is no longer beneficial. Bhattacharjee (2001) found that the consumers' perceived usefulness and satisfaction will diminish when their perceptions of performance are worse than expected, and then they will reassess the web site and decide whether or not to use it in the future. Therefore, it is necessary for the web retailer to maintain consumers' trust and to constantly improve the usability of their site. Especially in the Internet-based e-commerce environment, pure-play e-retailers constantly encounter the threats of potential competitors. The maturity and low cost of technology lowers the entrance threshold of new competitors and the transparency of information makes the business model easily imitable by competitors. To sustain customers and strengthen competition advantage, web retailer must plan effective strategies to increase the customers' beliefs of perceived usefulness and trust.

### **6.3. Limitations**

This study is not without its limitations. First, subjects of the study came from two sources and were not sampled randomly. Therefore, the sample may not be fully representative of the population. Second, the use of self-report scales suggests the possibility of a common method bias for some of the results. Limitations, notwithstanding, our study highlights the importance of habit and web quality in consumer e-commerce.

### **6.4. Suggestions for future research**

Given the importance of habit in web site usage, and by extension in the context of information systems where much uncertainty is present, it seems necessary for researchers to seriously examine the role of habit in technology adoption. Although the associations between habit and trust and between habit and perceived usefulness were established in our study, further research in different contexts is encouraged to enhance the generalizability of the results.

While the high variance explained by the model shows that many of the significant variables have been captured, there is always the possibility of other predictors of continuance intentions. For instance, Moon and Kim (2001) argued that perceived playfulness reflects users' intrinsic beliefs in web acceptance, and Koufaris (2002) found that shopping enjoyment has an impact on consumers' intention to revisit a Web site. These factors emphasize the hedonistic perspective in technology acceptance.

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