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The impact of the online and offline features on the user acceptance of Internet shopping malls

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Abstract

Internet shopping mall has the dual nature of Web-based application system and traditional shopping mall. This paper explores online and offline features of Internet shopping malls and their relationships with the acceptance behaviors of customers. The results from a Web survey of 932 users show that the technology acceptance model (TAM) is valid in predicting the acceptance of the Internet shopping malls and that online and offline features have positive effects on the user acceptance. Both online and offline features have greater effects on the usefulness, attitude, and intention to use than either online or offline features separately. This study provides a domain-specific, integrative approach in evaluating the quality and antecedents of user acceptance for Internet shopping malls.

Keywords: Online features; Offline features; Technology acceptance model; Internet shopping mall

1. Introduction

The Internet shopping mall as one of the types of electronic commerce has proliferated rapidly since the middle of 1990s where Web technologies have played a major role in this growth [5]. The growth of Internet shopping mall is expected to be accelerated because it has a lot of incentives such as convenience, broader selections [7], competitive pricing, greater access to information, product quality, and time to receive product [19]. However, it seems to be not always successful for an individual shopping mall to employ Internet system for strategic purposes. It should compete with other Internet shopping malls, traditional shopping channels and brick-and-mortar companies. Furthermore, practitioners say that customer satisfaction is more challenging in the Internet commerce than ever before because customers are more demanding and information empowered to make their own decisions, and want their needs met immediately, perfectly, and for free [6]. Thus, it still remains as a key challenge for the Internet

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shopping malls to understand customer requirements and enhance his/her satisfaction.

Researchers and practitioners explored to examine the factors affecting the user satisfaction and usage in the Internet shopping malls. They tried to make an assessment of the quality of their e-commerce offering as perceived by their customers. Yet the factors or quality measurements are widely varied and there is no agreement in those views. Some discussed the aspects of Web quality in a descriptive manner without delineating its major dimensions [16,26] while others focused on the success factors of the Internet shopping mall [4,5,21,31]. The variations are largely caused by the different origins of Internet shopping mall, i.e. information system (IS) views and marketing views. The IS-oriented views explain and predict consumer acceptance behavior by examining the technical specifications such as system quality, information quality, and service quality [3,22,25,29]. The marketing-oriented views regard the Internet shopping mall as a type of shopping channels and deal with consumer satisfaction and purchase intention by examining traditional marketing factors such as product perceptions, delivery services, and price [24,28].

It is recommended to have integrative perspective and domain-specific approach to understand the user behavior and measure the relevant quality for specific Web system like Internet shopping mall. Although Internet shopping mall is based on Web application system, it is more than its IT interface. It is a business entity with which the customers are economically engaged [12]. Customers "browse" an Internet shopping mall just as they "visit" a brick-and-mortar shop, "create order transactions" just as they "purchase products." They anticipate timely delivery of the exact product which they have ordered either in the online or offline shop. An Internet shopping mall is, therefore, a full representation of the store to the consumer. Although online consumers have unique needs and concerns that reflect their online environment, they still share some characteristics of their offline counterparts. It is likely that both the online and offline quality significantly affect the user perception and attitude toward the use of an Internet shopping mall.

The first purpose of this study is to empirically explore the offline and online quality factors of Internet shopping malls based upon the integrative perspective of IS and marketing. The second is to investigate the relationship between the quality factors and user acceptance behaviors through path analysis where the technology acceptance model (TAM) is applied as a theoretical foundation. It focuses on the relationships between offline features and each construct of TAM, and the relevance of the integrative approach by considering both offline and online features to the acceptance of Internet shopping mall.

The next section introduces related literature. The research design and survey results, discussions are presented in the following sections. The final section explains the implication of this study and proposes further research directions.

2. Literature review

In the context of electronic commerce (EC), the functions and features provided by companies' Web sites can be classified into several phases of marketing: pre, online, and after sales [26]. The pre-sales phase includes a company's efforts to attract customers by advertising, public relations, new product or service announcements. Customers' electronic purchasing activities occur in the online sales where orders and charges are placed electronically through Web facilities. The after-sales phase includes customer service, delivery, and problem resolution. This phase should generate or obtain customer satisfaction by meeting various expectations of customers. Thus, customer satisfaction may be accomplished not only by the quality of online features but also by that of offline features in all the three phases of marketing.

As Internet shopping mall deals with both IS and marketing activities, the literature from both areas is appropriate in the research context. Based on synthesis of this work, we group the quality factors of Internet shopping mall into two categories relating to online and offline features. Online features mean the quality of Web system which adopts the IS/Web quality measures such as system, information, and service quality while

offline features mean the back-office factors such as product quality and delivery service. This study uses the TAM as a base model which is the most influential and widely discussed theory in predicting and explaining the end-user behavior and system use [9]. The TAM is likely to be suitable as a theoretical foundation for the user acceptance of Internet shopping mall because Internet shopping mall is still system-based.

2.1. Online features of Internet shopping mall

The online features are the quality measures of Web system or services provided by the Web system. As an Internet shopping mall provides its major services by Web environment, the IS-oriented view of the Internet shopping mall suggests that the drivers for consumer acceptance are based on the system features such as design, functionality, security, and information quality [27,29], and services features, supported by the Web system, such as reliability, responsiveness, and empathy [28]. Pit et al. [28] introduced the augmented model which includes system, information, and service quality as independent variables for IS success. Zhang and von Dran [32] explored the quality measures using factor analysis and showed that the factors such as information, service, and design are the key success factors for e-commerce. Ahn et al. [3] showed that the system, information, and service quality have significant impacts on user attitude and user technology acceptance of Internet shopping malls. Quality concept and measurements of Web system are widely varied according to the research objective, but the main category is in the balanced stream of system, information, and service quality.

2.1.1. System quality

System quality describes the measures of Web sites as information processing system and taps the engineering-oriented performance characteristics such as operational efficiency and appearance. The typical measures of this area for traditional IS include system availability, reliability, responsiveness, and system flexibility [17,25]. As the design of a Web site is within the framework of IS, system quality is still an important measure in the Web context. Some examples are design [26,29], appearance and technical adequacy [4], download delay [27,30], navigation [27], security and privacy [29], and hypermedia presentation [30]. These system quality measures are likely to provide users with more convenience, enhance privacy, and reduce the time for information seeking.

2.1.2. Information quality

Traditionally, information quality has been the quality of reports that the system produces. In the Web environment, the information is related to not only the report but also the user presentation itself. The most commonly used items for information quality are accuracy, currency, completeness, timeliness, and understandability [10,22,25]. Information quality is likely to help users to compare shopping products, enhance shopping enjoyment, and take better purchase choices. Prior research stressed the importance of information quality, and most frequently used measures in the Web context are the content and content quality [4,5,27,29]. They appeared to have increased the intrinsic and extrinsic beliefs of users toward using Internet shopping malls [3,25].

2.1.3. Service quality

Service quality in the traditional IS environment is based on the perspective that the organization is composed of multiple processes with the goal of providing the customer with high-quality service. It typically refers to availability of multiple communication mechanisms for accepting consumer complaints and timely resolution of complaints, but may also include assisting consumers in using a product effectively, suggesting complementary products or service, and joint problem-solving [6]. Service quality is important because of the lack of face-to-face contact on a Web site. It is more necessary for Internet shopping mall than other Web site because Internet shopping mall should provide online services in finding, ordering, and delivering the physical products. Typical dimensions are tangibles, reliability, responsiveness, assurance, and empathy [3,5,28]. They are likely to enhance the usability of Web site and support users in each step of purchasing process.

2.2. Offline features of Internet shopping mall

Although the online quality factors play an important role in the purchasing decision process of consumer, there is also a need to consider other potential values of adoption from the consumer's perspective. These benefits are typically rooted in traditional marketing criteria such as access to better products and higher levels of delivery service. These features are intrinsically different from online features. For example, the variety and functionality of physical product give limit to information shown at the Web sites. The delivery functions are performed by offline operations rather than by Web presence. Grewala et al. [13] insist that delivery and customer service are more important than online features. Gurau et al. [14] also showed that physical logistics are important for e-commerce.

2.2.1. Product quality

Customer's product perception is the expected standard of product or service excellence. Although Internet shopping mall deals with physical and digital products or services, the basic concept of product quality is not different from that of traditional commerce. The most influential factors appear to be product quality and product variety [18]. Product quality means the actual functionality of the product, consistency between the quality specification of Internet shopping mall and real quality of the physical product. Variety is the assortment or a range of goods available from a shop. Customers are likely to visit an Internet shopping mall with various and high-quality products. If the product quality meets their expectation, customers tend to regard the Internet shopping mall as useful and continue to visit it. Keeney [19] posited that maximization of product quality is one of the "fundamental objectives" for shoppers.

2.2.2. Delivery service

Reliable and timely delivery is one of the fundamental objectives for online shoppers. Online shoppers make their orders at their office or home anticipating quicker delivery than offline purchasing, and timely delivery on his convenient time. The timely and reliable delivery makes users satisfied so that they will keep using the Internet shopping malls. On the contrary, even though the Web presence has well designed Web pages and powerful Web features, the consumer may turn to other Web sites or traditional brick-and-mortar shops if the delivery time is too late or delivered item is different from the product listed at Web sites. Keeney [19] argued that reliable delivery is an item of "means objectives" in e-commerce while time to receive product is one of the "fundamental objectives."

2.3. Technology acceptance in Internet shopping mall

2.3.1. Technology acceptance model

The Web site for a specific Internet shopping mall is the main method by which the service provider and customers interface through purchasing process. It is a very serious concern to understand user expectations and how they feel about the Web sites they use. The more one has positive attitude, the higher intention he/she has to revisit a Web site. The TAM has emerged as a powerful model among the models investigating the acceptance and use of information technology (IT), including the innovation diffusion theory and the theory of reasoned action [3]. TAM postulates that the perceptions or beliefs about the innovation are instrumental in the development of attitudes that eventually result in system utilization behavior. It posits that the actual system use is determined by each user's behavioral intention to use, which is in turn influenced by each user's attitudes toward use. Finally, the attitude is directly affected by the ease of use and the usefulness of the system [7,8]. The studies subsequent to Davis [8] suggest that TAM yields highly consistent results on the acceptance behavior of the users towards new systems in the office environment [1,2]. In addition, a number of recent studies have successfully adopted TAM to study the acceptance of Internet related technologies [6,7,20,22,25]. Thus, TAM may be suitable as a theoretical foundation for Internet shopping mall research because the basis of the Internet shopping mall is system-based.

2.3.2. External variables of TAM

Although TAM is an influential model in the IS field, some researchers have improved TAM by incorporating what have been termed "external variables". Such external variables may improve the viability of TAM in the context of traditional IS and Web based system. There are increasing amounts of research which focused on Web quality factors with regard to the user acceptance in the Web context. Lederer et al. [22] found that information quality has a significant relationship with perceived usefulness. Lin and Lu [25] showed that the information quality, response time, and system accessibility have an effect on perceived ease of use and usefulness.

Besides the online quality factors, some domain-specific measures were tested for Internet shopping mall. Koufaris et al. used search mechanism, positive challenge, and product involvement as external variables for DVD shop [21], and they also applied Web skill to TAM in general shopping malls [20]. Liao and Cheung [23] tested their extended TAM with security, network speed, price, experience, vendor quality, and education for e-Shop domain.

Although TAM postulates that antecedent variables intervene indirectly by influencing perceived ease of use and perceived usefulness, there is no clear pattern with respect to the choice of the external variables for Internet shopping malls. Although there are increasing numbers of studies which have investigated the relationship between Web quality and user acceptance, the concern about these studies is that most of them take the system focused approach and give little attention to offline quality factors.

3. The research model

The model of this study is based on the TAM provided by Davis [8]. Although there are some additional constructs to TAM such as confirmation satisfaction loyalty incentives, concentration, enjoyment [6,20], we think that the original constructs of TAM are valid enough for the purpose of this study in exploring the relationships between the external variables and user acceptance of Internet shopping mall. The model validates the online and offline features as the antecedents for user beliefs of using the mall. It is postulated that each of the five perceived Web quality factors of user positively affects the perceived ease of use and usefulness. As offline operations are not the features of system functions, they are not likely to be mediated by the ease of use. Instead, they are expected to directly affect the perceived usefulness. As previous research has shown that the actual use is predicted by the intention to use [9], we operationalize the adoption decision as the intention to use. The research model underlying this study is shown in Fig. 1. The unit of analysis is the user of Internet shopping malls. The population of data consists of the individuals who use it for purchasing specific items.

3.1. Measurement development

The questionnaire, using a seven-point Likert scale, was employed to collect data for the constructs of the research model. The measure items for the quality construct were derived from IS and marketing literature. They were developed and validated instruments for measuring online features [5,27,29] and offline features [13,14,19].

The sample items were initially assessed by a Delphi method. Four information system professors were asked to evaluate the items and make changes to eliminate repetitive items, technical/non-user oriented items, and sub-attributes of higher level attributes. After three evaluation rounds, 31 Web quality attributes remained as shown in Table 1. Typical TAM constructs and related measurements were adopted from many previous studies [3,8,22,25].

Prior to administering the survey, a pilot test was conducted among 65 graduate students and MIS professors to pre-test for the content and readability. The authors deleted four measures which have low reliability scores and re-specified some wordings to clarify the meaning of each questionnaire item which was advised by the pilot test. The resulting questionnaire consisted of 51 items measuring the nine latent variables. All items of the questionnaire are shown in Table 1 and Appendix A.

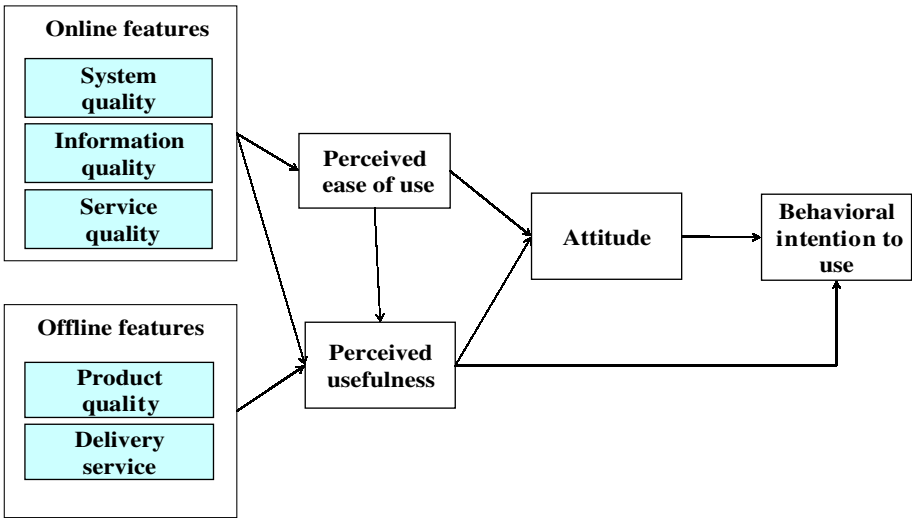

Fig. 1. Research model.

3.2. Web-based survey

In order to target online users, a Web-based survey was employed. We selected six Internet shopping malls which were listed as top ten in revenue and awareness during 2002 in Korea. The shopping malls posted the banner for our survey and linked it to the survey site.

The questionnaire consisted of an opening instruction page that would open a separate Web browser window containing the items to be assessed. Each respondent was asked to provide the name of Internet shopping mall where he/she linked from. The respondents were then instructed to answer all the questions based on their experience when using that particular Internet shopping mall. Respondents were asked to mark their answers to each of the questions using the 1 to 7 Likert type scales on which the anchor for 1 was "strongly disagree" and for 7 "strongly agree."

In total, 932 cases were gathered for the first two weeks in June 2003. The questionnaire responses were received into an MS access database, filtered to check for duplicates, and converted into a form usable in LISREL. Fifty nine percent of the respondents were female. Most respondents were in their twenties or thirties and have more than two years of experience with the Web. More than seventy percent of them use the shopping mall at home while their jobs were wide range of students, clerks, specialists, technicians, and housewives. More than 80 percent of participants have made purchases through the Internet shopping mall, which suggests that the information we have collected is more reflective of the views of "buyers" than those of "browsers." Detailed descriptive statistics relating to the respondents' characteristics are shown in Table 2.

4. Results

The research model was analyzed using the structural equation modeling (SEM) technique, supported by LISREL 8.12 software. Model estimation was done using the maximum likelihood method. Data analysis proceeded in two stages. The measurement model was first examined for validating and refining the research instrument, followed by the analysis of the structural equation model for testing the associations in our research model.

4.1. Measurement model

To analyze the dimensions of quality factors, we conducted the exploratory factor analysis without any priori constraints on the estimation of

Table 1
Quality constructs and measurement items of Internet shopping mall

Constructs	Measures	Questionnaire
System quality	Design	(The web site) has an appropriate style of design for business type
	Navigation	(The web site) has an easy navigation to information
	Response time	(The web site) has fast response and transaction processing
	System security	(The web site) keeps transactions secure from exposure
	System availability	I can use (the web site) when I want to use it
	Functionality	(The web site) has a good functionality relevant to site type
	Error free transaction	(The web site) keeps error-free transactions
	Multimedia	(The web site) provides an appropriate video-audio presentation
	Personal travel[a]	(The web site) supports personal travel in navigation
Information quality	Contents variety	(The web site) has sufficient contents which I expect to find
	Complete information	(The web site) provides complete information
	Detail information	(The web site) provides detailed information
	Accurate information	(The web site) provides accurate information
	Timely information	(The web site) provides timely information
	Reliable information	(The web site) provides reliable information
	Appropriate format	(The web site) communicates information in an appropriate format
	Better purchase choice[a]	(The web site) provides selective information for purchase choice
	Comparison shopping[a]	(The web site) provides comparative information between products
Service quality	Responsiveness	(The web site) anticipates and responds promptly to user request
	Reliability	(The web site) can be depended on to provide whatever is promised
	Confidence	(The web site) instills confidence in users and reduces uncertainty
	Empathy	(The web site) understands and adapts to the user's specific needs
	Follow-up service	(The web site) provides follow-up service to users
	Competence	(The web site) gives a professional and competence image
Product quality	Product quality	(The web site) deals products with high quality
	Product variety	(The web site) deals various products
	Product availability	(The web site) supports high product availability
Delivery service	Reliable delivery	(The web site) delivers the right product which was ordered
	Package safety	(The web site) delivers products with safely packaged
	Timely delivery	(The web site) delivers products at promised time
	Return easiness[a]	It is easy to return the product delivered

[a] Dropped after pilot test.

components or the number of components to be extracted. Table 3 shows the exploratory factor analysis of quality measures. Items were loaded for four factors at around 0.5 or more factor loading and emerged with no-cross construct loadings above 0.5. Product quality and delivery service loaded on one factor. The results show that the measures of product quality and delivery service would be expected to have similar profiles of differences across groups in user acceptance of Internet shopping mall. As we focus on the offline features including product quality and delivery service, we integrate the product quality and delivery service as one factor. As we regard the offline feature is composite dimension from a number of offline variables with a minimum loss of information, it appears to be reasonable for further research.

The internal consistency reliability of all questions was assessed by the Cronbach alpha and item-to-total correlations. The alpha coefficients and item-to-total correlations of measurement items for each construct are presented in Table 4. We dropped two items of ease of use, PEOU2 (expert's help) and PEOU5 (mental effort), from further analysis, whose values of item-total correlation were lower than the recommended value, 0.60 for field studies [15]. The values of item-total correlations range from 0.729 (for system quality – SYSQ3) to 0.930 (for attitude toward using

Table 2
Profile of respondents

Measure	Item	Frequency	Percentage (%)
Total		932	100.0
Gender	Male	385	41.3
	Female	547	58.7
Age	Below 20	16	1.7
	20–29	356	38.2
	30–39	463	49.7
	Over 40	97	10.4
Occupation	Student	178	19.1
	Clerical employee	160	17.2
	Specialist	119	12.8
	Technician	153	16.4
	Housewife	221	23.7
	Etc.	101	10.8
Primary place of Internet use	Office	246	26.4
	Home	676	72.5
	Etc.	10	1.1
Degree of Internet experience	Under 1 year	69	7.4
	1–4 year	409	43.9
	Over 4 year	454	48.7

– ATT2). The α values from 0.9025 (for system quality) to 0.9510 (for attitude toward using). Given the exploratory nature of the study, the validity and reliability of the scales were deemed adequate.

We examined the convergent validity of the measurement items by factor loadings, composite reliability, and the variance-extracted measure. The results of the test of convergent validity are also shown in Table 4. Factor loadings of all items in each construct range from 0.679 (SYSQ3) to 0.919 (ATT2) which exceed the recommended level of 0.60 [15]. The composite reliabilities range from 0.9025 (for system quality) to 0.9516 (for attitude toward using) which exceed the recommended level of 0.80 [15]. The variance extracted measures range from 0.5308 (for system quality) to 0.7974 (for attitude toward using) which also exceed the recommended level of 0.50 [15]. The results, therefore, demonstrate convergent validity of the measurement items.

Discriminant validity can be tested by comparing the squared correlation between two constructs with their respective variance extracted measure [11]. Table 5 shows the squared correlation of each pair of constructs and the variance extracted measures. The variance extracted measures of each construct are in the diagonal. It shows that all squared correlations between two constructs are less than the variance extracted measures of both constructs.

These results show that the users recognize the online and offline features as different domains. They consider system, information, and service quality as different factors within online features while they consider product and delivery as same factors within offline features. The results show the quality structure of the Internet shopping malls. Concerning the structure of the quality variables, there are clearly two separate and distinct dimensions of customer evaluation of the Internet shopping malls: online features and offline features. The two different dimensions are expected to have different profiles and roles in user acceptance behavior of Internet shopping mall.

4.2. Structural model

After assessing the reliability and validity, we tested the overall fit of our path model. The overall

Table 3
Results of exploratory factor analysis

	Factor loadings				
		Online service	System quality	Information quality	Product and delivery
SYSQ1	Design		0.725		
SYSQ2	Navigation		0.736		
SYSQ3	Response time		0.641		
SYSQ4	Security		0.551		
SYSQ5	Availability		0.642		
SYSQ6	Functionality		0.617		
SYSQ7	Error free		0.622		
SYSQ8	Multimedia		0.598		
INFQ1	Contents			0.635	
INFQ2	Completeness			0.733	
INFQ3	Detail			0.744	
INFQ4	Accuracy			0.719	
INFQ5	Timeliness			0.667	
INFQ6	Reliable information			0.641	
INFQ7	Format			0.600	
SVCQ1	Responsiveness	0.763			
SVCQ2	Reliability	0.776			
SVCQ3	Confidence	0.680			
SVCQ4	Empathy	0.755			
SVCQ5	Follow-up service	0.729			
SVCQ6	Competence	0.770			
PROD1	Product quality				0.719
PROD2	Variety				0.760
PROD3	Availability				0.781
DELI1	Reliable delivery				0.683
DELI2	Package safety				0.621
DELI3	Timely delivery				0.577

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization. A rotation converged in eight iterations. Rotated factor loadings, with values <0.5 suppressed are displayed.

model fit evaluates the correspondence of the actual or observed input matrix with that predicted from the proposed model. The summary of the overall fit indices of our research model is shown in Table 6. The χ^2 value of 278.605 with 10 degrees of freedom is statistically significant at the 0.000 significance level. The GFI value 0.938, RMSR value of 0.0577 and most other values surpass the recommended level while AGFI value of 0.776 is at a marginal acceptance level.

We compared the proposed model with other competing models; TAM with only online quality variables and TAM with only offline quality variables. The results indicate that the absolute fit measures and incremental fit measures favor TAM with online quality variables while the parsimonious fit measures favor our research model. All the models are quite close with no substantive differences. Among the models, our research model excels on path coefficients (β) and squared multiple correlation coefficients (R^2) especially for perceived usefulness. The three online factors account for 64.7% of the variance and the offline factors account for 57.5% of the variance in usefulness while online and offline factors account for 66.7% of the variance in usefulness. Therefore, we are assured that the path diagram for our research model is a more adequate representation of the entire set of causal relationships than other comparative models. Other paths between offline features and attitude and intention to use provided only a small increase in explanation power of the path coefficients. This reconfirms that the impact of offline quality on

Table 4
Results of internal reliability and convergent validity test

Construct	Item	Internal reliability		Convergent validity			
		Cronbach α	Item-total correlation	Standardized loading	Standard error	Composite reliability	Variance extracted
System quality	SYSQ1	0.9025	0.773	0.741	0.488	0.9025	0.5308
	SYSQ2		0.813	0.786	0.433		
	SYSQ3		0.729	0.679	0.519		
	SYSQ4		0.745	0.699	0.472		
	SYSQ5		0.789	0.753	0.463		
	SYSQ6		0.775	0.737	0.479		
	SYSQ7		0.784	0.747	0.460		
	SYSQ8		0.757	0.714	0.482		
Information quality	INFQ1	0.9113	0.802	0.764	0.416	0.9112	0.5950
	INFQ2		0.834	0.821	0.326		
	INFQ3		0.820	0.807	0.349		
	INFQ4		0.821	0.788	0.379		
	INFQ5		0.789	0.736	0.459		
	INFQ6		0.796	0.738	0.455		
	INFQ7		0.794	0.741	0.451		
Service quality	SVCQ1	0.9288	0.861	0.827	0.316	0.9289	0.6856
	SVCQ2		0.864	0.825	0.319		
	SVCQ3		0.826	0.782	0.389		
	SVCQ4		0.879	0.858	0.263		
	SVCQ5		0.845	0.818	0.330		
	SVCQ6		0.877	0.855	0.269		
Product and delivery	PROD1	0.9079	0.873	0.915	0.163	0.9100	0.6316
	PROD2		0.843	0.853	0.272		
	PROD3		0.873	0.896	0.198		
	DELI1		0.793	0.691	0.523		
	DELI2		0.827	0.713	0.492		
	DELI3		0.785	0.661	0.563		
Perceived ease of use[a]	PEOU1	0.9080	0.841	0.781	0.390	0.9091	0.6671
	PEOU3		0.872	0.852	0.273		
	PEOU4		0.873	0.852	0.274		
	PEOU6		0.862	0.822	0.325		
	PEOU7		0.833	0.773	0.402		
Perceived usefulness	PU1	0.9257	0.814	0.744	0.447	0.9256	0.6408
	PU2		0.816	0.742	0.450		
	PU3		0.833	0.774	0.400		
	PU4		0.838	0.785	0.383		
	PU5		0.839	0.822	0.324		
	PU6		0.815	0.870	0.243		
	PU7		0.843	0.856	0.267		
Attitude toward using	ATT1	0.9510	0.917	0.904	0.183	0.9516	0.7974
	ATT2		0.930	0.919	0.155		
	ATT3		0.925	0.908	0.175		
	ATT4		0.920	0.897	0.196		
	ATT5		0.883	0.834	0.304		
Behavioral intention to use	BI1	0.9228	0.880	0.870	0.243	0.9261	0.7167
	BI2		0.901	0.917	0.158		
	BI3		0.909	0.913	0.166		
	BI4		0.822	0.708	0.499		
	BI5		0.877	0.806	0.350		

[a] Two items were dropped from the final scales.

Table 5
Comparison of squared correlation and variance extracted

	1	2	3	4	5	6	7	8
1. System quality	(0.5308)							
2. Information quality	0.5296	(0.5950)						
3. Service quality	0.4377	0.4582	(0.6856)					
4. Product and delivery	0.5099	0.4503	0.4808	(0.6316)				
5. Perceived ease of use	0.4966	0.3895	0.3239	0.4416	(0.6671)			
6. Perceived usefulness	0.4875	0.5436	0.4644	0.5133	0.4312	(0.6408)		
7. Attitude toward using	0.4962	0.5037	0.3889	0.5143	0.4162	0.6397	(0.7974)	
8. Behavioral intention to use	0.4772	0.4070	0.3501	0.5013	0.4114	0.5324	0.6775	(0.7167)

Values in parentheses: variance extracted.

Table 6
Fit indices for the structural models

Fit index	Research model	Online quality with TAM	Offline quality with TAM	Recommended Cut-off values [17]
Absolute fit measures				
Chi-square (χ^2)	278.605	152.756	149.553	The lower, the better
Degrees of freedom	10	7	3	
Significance level	0.000	0.000	0.000	
Goodness-of-fit index (GFI)	0.938**	0.958**	0.945**	>0.90
Root mean square residual (RMSR)	0.0577**	0.0424**	0.0544**	<0.08
Incremental fit measures				
Adjusted goodness-of-fit index (AGFI)	0.776*	0.832*	0.724*	> 0.9
Tucker-Lewis index (TLI) or (NNFI)	0.939**	0.952**	0.896*	> 0.9
Normed fit index (NFI)	0.978**	0.983**	0.967**	> 0.9
Comparative fit index (CFI)	0.978**	0.984**	0.969**	The higher, the better
Parsimonious fit measures				
Parsimonious normed fit index (PNFI)	0.349*	0.328*	0.291*	The higher, the better
Parsimonious goodness-of-fit index (PGFI)	0.260*	0.240*	0.189*	The higher, the better
Squared multiple correlation				
PEOU	0.525	0.525	N/A	
PU	0.667	0.647	0.575	
ATT	0.704	0.692	0.689	
BI	0.719	0.709	0.702	

Acceptability: *(marginal), **(acceptable).

the attitude and intention to use is strongly mediated by perceived usefulness.

Having assessed the overall and measurement model, we examined the estimated coefficients of the causal relationships between constructs. Fig. 2 illustrates the estimated coefficients and their significance in the proposed structural model. The coefficients of determination (R^2) or each dependent construct are also shown in the figure.

System quality has the strong significant influences on perceived ease of use ($\beta = 0.613,\ p < 0.01$) and usefulness ($\beta = 0.077,\ p < 0.05$). Information

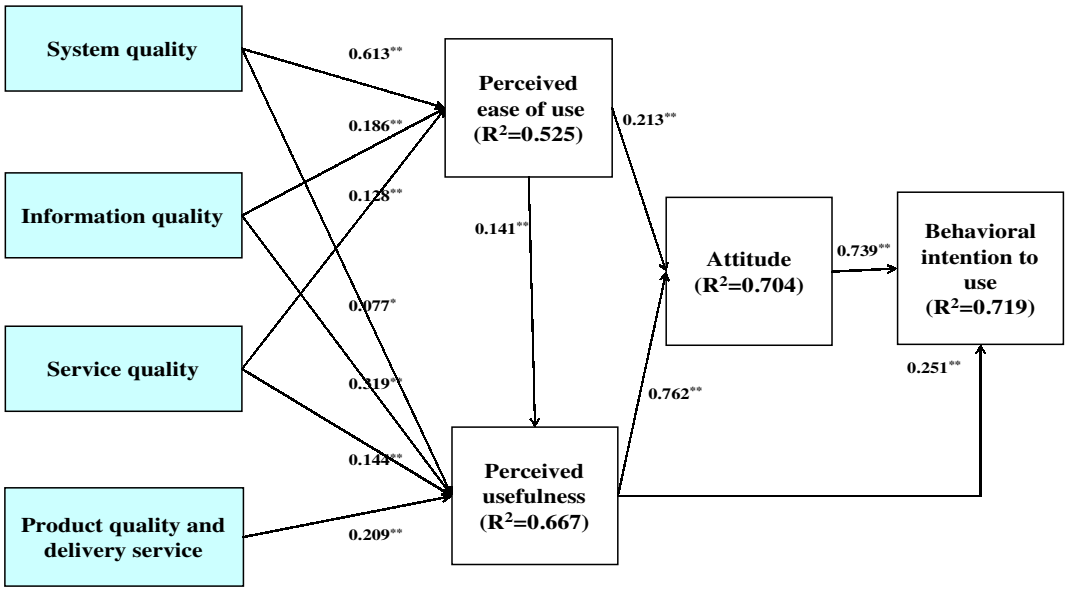

Fig. 2. Structural model fit. Model goodness-of-fit: $\chi^2 = 278.61$ (df = 10), NFI = 0.978, NNFI = 0.939, CFI = 0.978. Path significance: $^{*}p < 0.05$, $^{**}p < 0.01$.

quality has the strong significant influences on perceived ease of use ($\beta = 0.186,\ p < 0.01$) and usefulness ($\beta = 0.319,\ p < 0.01$). Service quality also has the significant influences on perceived ease of use ($\beta = 0.128,\ p < 0.01$) and usefulness ($\beta = 0.144,\ p < 0.01$). Product quality and delivery also has the significant influences on usefulness ($\beta = 0.209,\ p < 0.01$).

The results show that the system quality has an impact on perceived usefulness mediated by perceived ease of use while the information quality and service quality have an impact on usefulness directly and indirectly through ease of use. The product quality and delivery show that they directly affect the usefulness. Among the external online and offline quality variables, information quality has the biggest effect on perceived usefulness and behavioral intention to use Internet shopping mall.

4.3. Discussion

The purpose of this study was to explore the online and offline features with regard to the customer acceptance behavior of Internet shopping malls. We test the quality dimensions of Internet shopping malls and the impact of quality features on user acceptance variables.

The results show that the customers recognize the online and offline features as different domains. Consistent with previous research [3], they regard the online quality as system, information, and service quality while they additionally regard the offline quality as product and delivery. This means that the customer plays both as a system user and a shopper just as we defined the Internet shopping mall as a Web system and a cyber shop. The categorization gives us a domain-specific and integrative approach to the Internet shopping mall, i.e., both of system focused and marketing focused. The role of online and offline quality is important because they are under full control of the company and influence the beliefs and behavioral intention so as to encourage the system use while other psychological factors (i.e., user beliefs, attitude, intention to reuse), or demographic factors (i.e., age, experience, decision style) are hardly manageable by the company.

The results show that TAM yields highly consistent results on the acceptance behavior of the users towards Internet shopping malls. An individual's attitude toward the use of the Internet

shopping mall is significantly affected by the individual's perception about the ease of use and usefulness. The two constructs, perceived usefulness and perceived ease of use, mediated the external variables to influence Internet user's decision to visit the Internet shopping mall for purchases. Consistent with the previous research [25], the usefulness is more strongly linked to the intention to use than the ease of use while the ease of use exerts a significant effect on the usefulness. This implies that the usefulness is still the primary concern for using an Internet shopping mall. The ease of use has an indirect effect on the formation of intentions. That is, the easier an Internet shopping mall is to use, the more useful it is perceived to be.

At the same time, both online quality and offline features have greater effects on usefulness than online quality alone. The individual's acceptance of the Internet shopping mall may be better explained by both online and offline features of Internet shopping malls. Most of previous research suggests system-oriented variables such as design, functionality, security, content variety, and information quality. But this study demonstrates that the offline features also play an important role for user acceptance for Internet shopping mall. In our study, information quality is still the primary concern for using an Internet shopping mall while the product quality and delivery service have more effects on the perceived usefulness than the system quality and service quality. This result is consistent with a previous study that shows that many consumers appear to be disillusioned with late deliveries, phantom purchases, and out-of-stock items on online shop [6]. This study demonstrates the validity of integrated concept of quality features from the standpoint of individual-level technology acceptance research for Internet shopping mall.

The results give managerial implications to practitioners regarding how to invest their time and resources when designing and operating Web sites. Research shows that it is not always successful for an individual shopping mall to employ Internet systems for strategic purpose. They even may be endangered their precious business images by applying "inappropriate" strategy with websites [25]. In a given environment of high competitiveness and resource limitation, the company can take selective approaches among external variables. If customers find an Internet shopping mall to be too difficult to navigate and make transactions, the manager should try to improve its usability by enhancing system quality. If many of current customers do not browse again or seem to move to other competitive sites even if the Web presences are as good as those of competitors, the manager should seriously monitor the product quality and delivery services. As such, the online and offline quality measures may be used as the performance indicators for each functional team and the benchmarks to evaluate the current Web system against other competitive shopping malls.

5. Conclusion

This study explores the quality features of Internet shopping malls with regard to the customer acceptance behavior. The results show that there are two separate and distinct dimensions of evaluation used by the customers in terms of the structure of the quality variables; online features and offline features. The two features have different profiles and effects on user acceptance of Internet shopping mall. Online quality has a positive impact on perceived ease of use and usefulness, while offline quality has a positive impact on usefulness.

The results mean that the users of an Internet shopping mall consider the Web site not merely as an information system but also as a virtual store which provides the full stages of purchasing process of finding, ordering, and receiving. The dual nature of the online consumer as a tradition shopper and an Web user implies that the offline features are just as important to retain customers as online quality factors. Hence, the practitioners seeking to increase the visit of user and purchasing through their Web sites should emphasize not only the online presence of Internet shopping mall but also the back office operations such as product sourcing, logistics, and customer services. The Internet shopping mall should have higher benchmarks to have the high quality of both online and

offline quality to have competitive edge in the Internet shopping market.

The contributions of this study are that we were able to see and suggest the "broader picture" in terms of the extended quality measures by including the offline quality, and how the customers regard the quality measures of Internet shopping malls. It empirically demonstrated that the offline features as well as online features have a significant impact on the user acceptance in the Internet shopping mall. It suggests that the virtual store managers and developers should have domain-specific and integrative approach to evaluate the Web-based Internet shopping mall, and can take selective strategy to enhance the user beliefs and increase the customer intention to return by considering both online quality and offline features.

Although this study provides meaningful implications for Internet shopping malls, it has some limitations and thus has further research issues. First, all external variables are based on the perceived quality of users, which are subjective and may be influenced by each user's individual characteristics such as Web site skills, sensitiveness to price, and level of demanding for delivery time. Different results may be obtained if we measured the online and offline quality from the independent Web survey companies or if we compared the actual delivery time of specific item across the Internet shopping malls.

Second, although the results show that the quality factors of Web presence and offline features affect the user's beliefs in Internet shopping malls, it is important to realize that other factors may also play an important role in user beliefs. Examples of such factors include peer influence, computer experience, and innovation characteristics. Future research should enhance the search for antecedents affecting the user beliefs.

Finally, this study focuses on the online shopping mall domain. The comparative analysis of Web quality and user acceptance model for various Web site domains is another challenging research area. We may assume that the effect of Web quality factors on user's beliefs may differ by the type of Web site. We may not need to adopt the offline features for the product or services that have pure online contexts. We can also consider other intrinsic measures of user beliefs to better understand the user behaviors for various Web domains.

Appendix A

This appendix contains the statements used in the survey. Respondents were asked to mark their answers to each of the questions using the 1 to 7 Likert type scales on which the anchor for 1 was "strongly disagree" and for 7 "strongly agree"

A.1. Web quality questionnaires

System quality, information quality, online service quality, product quality, and delivery service measures are presented in Table 1.

A.2. Perceived ease of use

PEOU1. Learning this Web site is easy for me
PEOU2. It will be impossible to use this Web without expert help
PEOU3. My interaction with this Web is clear and understandable
PEOU4. It is easy for me to become skilful at using this Web
PEOU5. Using this Web requires a lot of mental effort
PEOU6. I find it easy to get this Web to do what I want it to do
PEOU7. I find this Web site user friendly

A.3. Perceived usefulness

PU1. Using this Web enables me to accomplish tasks more quickly
PU2. Using this Web helps me to get better decision
PU3. Using this Web improves the performance of my tasks
PU4. Using this Web saves me money
PU5. Using this Web increases my task productivity
PU6. Using this Web improves my task quality
PU7. Using this Web makes my job easier

A.4. Attitude to use

ATT1. Using this site is a good idea
ATT2. Using this site is a wise idea
ATT3. Using this site is satisfactory idea
ATT4. Using this site is a positive idea
ATT5. Using this site is an appealing idea

A.5. Behavioral intention to use

BI1. I will keep use of this Web site in the future
BI2. I will use this Web on a regular basis in the future
BI3. I will frequently use this Web site in the future
BI4. I will use this Web site rather than other Web sites for purchasing product
BI5. I will recommend others to use this Web site

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