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Website Design and Usage Behaviour: An Application of the UTAUT Model for Internet Banking in UK

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Abstract

A well designed website brings numerous benefits to firms. Some of these benefits are well established. But what elements of the website design really matter and how do these in turn influence website usage behaviour? Adopting the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical foundation, we report the findings from a survey of 316 users of internet banking; data were collected through an offline questionnaire developed based on the literature review and previous studies,directed to a convenience sample. Structure equation modelling, the two steps approach, starting with measurement model and then the structural model was applied.We demonstrate that the technical, general content and appearance dimensions of a Web site are the most important for users. In addition, these dimensions are significantly related to usage behaviour directly and indirectly through belief constructs. We also find that the impact of performance expectancy on usage behaviouris significant in predicting usage. Implications and Recommendationswere provided after thorough discussion.

Keywords: online behaviour, website design dimensions, usage behaviour, technology acceptance

1. Introduction

Internet technology and applications has created new ways of interaction with consumer and the growing reliance on computerized systems turned consumers to using internet access as a more convenient channel. An increasing number of businesses are investing in customer directed online source technologies in an effort to garner a share of the online marketplace. Many traditional retail firms such as banks are evaluating different ways to improve their web presence and succeed in their online project.

This study focuses on web design quality aspects that impact consumer actual usage of banks online presence in the UK. Previous work on website design characteristics presented numerous factors and features that are deemed important in the virtual existence, from users and competition perspectives. In the Internet banking environment, system characteristics, specifically functional features of the bank website, are considered of most importance (Ndubisi & Sinti, 2006) as well as system security, which is an important quality of online transactions by both users and non-users (Gerrard & Gunningham, 2003) and risk, which is a key determinant of attitude toward online banking acceptance (Curran & Meuter, 2005). Information security refers to consumers' belief about the web vender's ability to fulfil security requirements, e.g. authentication, encryption, and no repudiation (Cheung & Lee, 2001). Information protection is defined as the consumers' belief about the web vender's ability to safeguard their personal information from security and privacy preaches. When consumers feel comfortable with the way the bank website will protect their personal information and financial details, they overcome any psychological barrier to engage in the online banking services.

Conversely, information technology and user acceptance research reports numerous factors affect behavioural intention or usage behaviour. The unified theory of acceptance and use of technology (UTAUT), an aggregated model of eight different models in the field of information technology and user acceptance, comprises three important antecedents for usage intensions while a fourth factor, facilitating conditions, serve as a determinant of actual usage (Venkatesh et. al., 2003).

The objective of our study is to examine the impact of the web design quality concept on online banking actual

usage. In order to achieve that, we extend the original UTAUT model to incorporate web design quality concept as a multidimensional construct. In the original UTAUT model, facilitating conditions measures the type of support an individual might receive at work at the time of adopting a new technology. Given that online banking usage is a voluntary behaviour, we propose that within the online context the web design quality concept would have the utmost effect on online banking system usage.

2. Conceptual Framework

Our framework in Figure 1 presents website design elements as driving the Internet banking behaviours, and this process is moderated by performance expectancy. Performance expectancy, in turn, is positively related to social influence, experience and effort expectancy. In what follows, the constructs under consideration in this study and our rationale for linkages between individual concepts and further details of theory, on which we rely, is outlined.

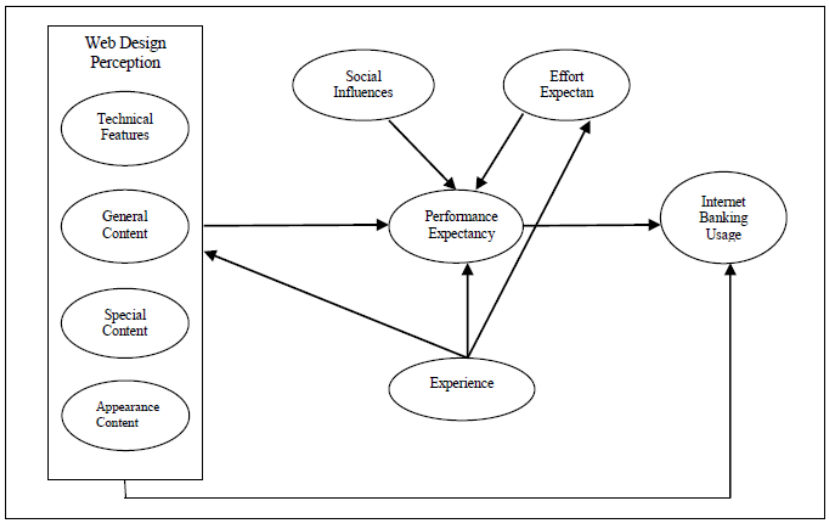

Figure 1. Conceptual model

The aggregated technology acceptance (UTAUT) model is a parsimonious model comprising four beliefs; three of which posit as direct determinants of intentions to use: effort expectancy, performance expectancy, and social influence, while the fourth, facilitating conditions, serves as a determinant of usage behaviour. Although these determinants have their origins in the eight models that comprised the aggregated model and despite the similarity between the UTAUT key constructs and TAM, the authors of the UTAUT have emphasized that the components of their model are independent of any theoretical perspective. In other words, the authors cautioned against extending previously established linkages between these components (Vekatesh et al., 2003). This research intends to investigate such possible extension.

TAM research has established the links between perceived ease of use and perceived usefulness (PEOU-PU); and PU moderating role between perceived ease of use and behavioural intentions (PEOU-BI). TAM suggests the effect of external factors on intention is mediated by PEOU and PU (Davis et al., 1989). TAM2 has provided more understanding of PU determinants and found that social norms are antecedents to PU. In this study, the previously established relationships among TAM's variables are investigated to examine whether they prevail in the UTAUT model (specifically, whether effort expectancy (EE) and social influences (SI) have an impact on performance expectancy (PE), and whether PE mediates the effects EE and SI have on behavioural intentions).

H1: Effort Expectancy will have a positive effect on Performance Expectancy.

H2: Social Influences will have a positive effect on Performance Expectancy.

H3: PE will mediate the relations between EE-Usage and SI –Usage.

A significant body of literature examined the relationship between the elements of websites and its influence on usage intentions, online behaviour, and overall system satisfaction (e.g., Bauer, et al., 2005; Bauer et al., 2006; Blacke et al., 2005; Floh & Treiblmaier, 2006; Gan et al., 2006; Han & Stoel, 2009; Lee & Lin, 2005; Torkzadeh & Dhillon, 2002).

In a conceptual examination of what influences online behaviours, Dennis et al. (2009) gave the collective term web atmospherics to identify web design elements and postulated these to be the primary drivers of online behaviours. In an empirical study, Jayawardhena and Wright (2009) demonstrated that web attributes are significant in driving online behaviours. Other studies have attempted to examine the specific web site design elements that have an influence on behaviours. Aladwani and Palvia (2002) developed an instrument that captures key characteristics of website quality from the user's perspective. Perceived web quality was defined as a user's evaluation of a website's features meeting the user's needs and reflecting overall excellence of the website. Aladwani (2006) proposed a model that has its root in Davis' TechnologyAcceptance Model and considered as an extension to the earlier work (Aladwani & Palvia, 2002). This model examined the influence of the four sub-dimensions of a website on attitudes and purchase intentions of web consumers. First, the *technical* dimension which refers to technical characteristics of the website such as security, ease of navigation, search facilities, site availability, valid links, personalization or customization, speed of page loading, interactivity, and ease of access. The second dimension deals with *general content* which refers to characteristics such as content usefulness, completeness, clarity, currency, conciseness, and accuracy. The third dimension encompasses *specific content* refers to characteristics found on the website such as finding contact information, a firm's general information, product/service details, consumer policies, and customer support. The fourth and final dimension, appearance, refers to characteristics of the website such as attractiveness, organization, proper use of fonts, colours and proper use of multimedia.

In the UTAUT model, authors identified a direct determinant for usage behaviour, facilitating conditions. Facilitating conditions is a construct that reflects an individual's perception about his / her control over the behaviour (Venkatesh, Brown, Maruping, & Bala, 2008). Venkatesh et al. (2008) state that facilitating conditions in general refer to individuals' perceptions of the availability of technological and/or organizational resources that can remove barriers to the use of a system. It is argued that facilitating conditions emphasize the role external factors (e.g., resources) have on usage directly without the mediation of behavioural intention (Venkatesh et al., 2003). Based on this argument, web design and characteristics is a technical form of support in the online behaviour framework and as established in literature, website design quality has a considerable impact on individuals' behaviour over the world wide web.We therefore, hypothesize that,

H4: Website design elements will be positively related to usage.

Information systems research has long explored how system designs influence usage (Delone & Mclean, 1992; 2003). System designs also demonstrate an indirect effect on intentions to use through usefulness and ease of use (Davis, 1989; Igbaria, Guimaraes & Davis, 1995; Lee & Lin, 2005; Schaupp et al., 2006). Following these strands of research we propose that website design elements influence on usage will be mediated.

We examine the mediating role of performance expectancy between web design quality dimensions and internet banking usage.

H5: Website quality will have an indirect effect on usage through performance expectancy.

Previous research reports expertise and proficiency among respondents influence the use of technology (Novak et al., 2000; Lassar et al., 2005). Experience also impact perceived usefulness (Dishaw et al., 2002; Johnson & Marakas, 2000; Taylor & Todd, 1995c). Users' prior general computer experience affects their perceptions of ease of use (Gruiting & Ndubisi, 2006). Hypotheses six and seven address the expected direct effect of experience on effort expectancy and performance expectancy.

H6: Prior Experience will have a positive effect on Effort Expectancy.

H7: Prior Experience will have a positive effect on Performance Expectancy.

Experience also affects perceived behavioural control (Taylor & Todd, 1995b; King& Dennis, 2003). Research on computer-human behaviour reports that prior computer experiences significantly affect individuals' perceptions of computers and web technologies; the more computer-related experience, the more positive perceptions of computer and web technologies (Liaw, 2002). We investigate the role of prior experience (computer and internet knowledge) as an antecedent to website quality perceptions. The argument here is that experienced users in respect to computer and internet knowledge will appreciate the quality of the website design in terms of the four dimensions: technical, general and specific content, and appearance.

H8: Prior Experience will have a positive effect on Website Quality perceptions.

3. Methodology

An offline questionnaire was used to collect data using convenience sample and out of the four hundred research

instrument distributed 334 were retrieved and 316 wereusable making a 79% response rate.

The sample description showed that females comprised 36% and males 64%. The majority (70%) are educated (bachelor degree and above); 35% aged between 21-30 years and 30% aged 31-40; and almost equally distributed among four income categories. The relatively high level of education and predominance of males in the sample reflects the profile of online banking customers in the UK (Jayawardhena & Foley, 2000).

The research instrument is developed based on Venkatesh et al.'s (2003) key constructs measurement scale and Aladwani's (2006) website quality concept measurement scale (Table 1 depicts the Likert statements). The instrument is also pre-tested using focus group and pilot sample techniques to verify clarity of meaning and comprehension as well as functionality in respect to guidelines and time needed for complete response.

Table 1. Operational definitions of the research model variables

Variable	Definition	Items
Performance Expectancy (Venkatesh et al., 2003)	The degree to which an individual believes that using internet banking will help him/her attain gains in performing banking tasks through this channel.	o I find internet banking useful o Using internet banking enables me to accomplish banking tasks more quickly o Using internet banking increases the effective use of my time in handling my banking tasks o Using internet banking increases the quality of my banking services output at minimal efforts.
Effort Expectancy (Venkatesh et al., 2003)	The degree of ease associated with the use of internet banking.	o My interaction with internet banking is clear and understandable o I am skilful at using internet banking o Learning to use the internet banking system is easy for me o I find it easy to get the internet banking system to do what I want it to do
Social Influences (Venkatesh et al., 2003)	The degree to which an individual perceives that important others believe he/she should use internet banking and also measures bank staff support in usage of the internet channel	o People who are important to me think that I should use internet banking facilities o People who influence my behaviour think I should use internet banking. o The bank staffs are helpful in the use of the internet banking system. o The branch encourages the use of internet channel
Technical Quality (TQ) (Aladwani, 2006)	The technical characteristics of the website such as security, ease of navigation, search facilities, site availability, valid links, personalization or customization, interactivity, and ease of access	The Bank web site: (TQ 1-8) o looks secure for carrying out transactions o looks easy to navigate o has adequate search facilities o has valid links (hyperlinks) o can be personalized or customized to meet my needs o has many interactive features (e.g. online application for bank services) o is easy to access o pages load quickly
General Content Quality (GQ) (Aladwani, 2006)	The characteristics of the bank website content in general such as content usefulness, completeness, clarity, currency, conciseness, and accuracy.	The content of the bank's website is (GQ 1-6) o useful o complete o clear o current o concise o accurate
Special Content Quality (SQ) (Aladwani, 2006)	The specific content characteristics found on a website such as finding contact information, a firm's general information, product/service details, consumer policies, and customer support	On the bank's website I can find: (SQ 1-5) o contact information (e.g. email addresses, phone numbers, etc.) o general bank information (e.g. goals, owners) o details about their products and services o information related to customer policies (e.g. privacy and dispute details) o information related to customer services
Appearance Quality (AQ) (Aladwani, 2006)	The characteristics of the website appearance such as attractiveness, organization, proper use of font, colours and proper use of multimedia.	The bank website: (AQ 1-5) o looks attractive o looks organized o is easy to read o uses appropriate colours o uses multimedia features properly

4. Data Analysis

Structure equation modelling, the two steps approach, starting with measurement model and then the structural model is applied. In order to assess the impact of the website quality dimensions on Internet banking usage, at first the dimensions were treated as independent variables and incorporated in the measurement model for general assessment. The dimensions passed the measurement model testing step; however, the structural model step revealed a good fit measures and an insignificant reading for the direct paths (Quality dimensions- usage). Furthermore, results from modification indices: regression weights, after model refinement, show that the dimensions are correlated supporting the decision of treating website quality dimensions as first order factors. According to Chen et al. (2005), a second- order model is applicable when the lower order factors are substantially correlated with each other, and when there is a higher order factor that is hypothesized to account for the relations among the lower order factors.

The proceeding analysis incorporates the web quality factor as a second order factor and this is carried out in two parts. Part one aims at validating the measures of the website quality structure with its four dimensions and introducing the website quality concept as a higher order structure. Part Two incorporates the higher-order structure into the UTAUT, examines the measurement model fit and validity, and tests relations among variables in the structural model.

4.1 Part One: Validation of the Website Structure

First, the factorial validity of the theoretical construct, website quality perceptions is tested. This step examines the first-order CFA model design where:

1) Website quality perceptions can be explained by four factors: technical quality (TQ), general content quality (GQ), special content quality (SQ), and appearance quality (AQ).

2) Each item-pair measure has a non-zero loading on the factor that it is designed to measure and a zero loading on all other factors.

3) The four factors, consistent with the theory, are correlated.

4) Errors associated with each measure are uncorrelated.

Using Amos–Graphics, version 18, CFA was run several times on the first order structure while applying the refinement criteria guidelines of Hair, et al. (2006) and Byrne (2001): (1) standardized regression weights (S.R.W.) values should be above 0.5 and preferably above 0.7; (2) squared multiple correlations (SMCs) should be above 0.5; (3) standardized residual covariances (S.R.C.) should be above 2.58 or below -2.58 or what is known as the absolute value (Byrne, 2001); and (4) items for which the modification indices (MI) reveal high covariance between measurement errors accompanied by high regression weights between these errors' constructs are candidates for deletion (Byrne, 2001; Hair et al., 2006). The model specification, after applying the refinement criteria mentioned above, resulted in specifications depicted in Figure 2.

The model fit statistics indicated a good fit: CMIN = 86.19 with df = 59 and CMIN/df ratio = 1.46, which is < 2, indicating an acceptable fit (Byrne, 2001; Carmines and McIver, 1981); standardized RMR =. 035 and GFI = .94; NFI = .96 and CFI = .986 all indicating a good fit (Byrne, 2001; Hair et al., 2006; Schmacker and Lomax, 2004); and RMSEA = .047 with 90% confidence interval of (.023 and .068) and a PCLOSE = .558, which is non-significant, thus indicating 90% confidence that the RMSEA value falls within these two interval values (Byrne, 2001).

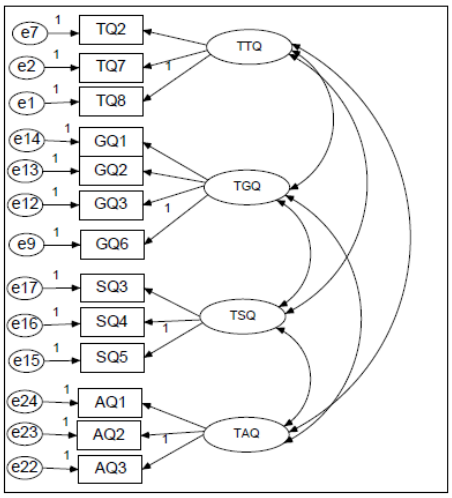

Figure 2. Web design dimensions first-order model specifications

The readings show that the website quality perceptions construct is best presented as a multidimensional construct. Such result on the first-order level permits proceeding to the second stage. Introducing the higher order factor, website quality perceptions, requires constraining the variance of the higher order to one or constraining one of the paths to one: at this stage option one is applied.

The first run after introducing the second order factor revealed a need for modifications, as variable special content quality (TSQ) has low factor loadings (SMC) below 0.5, and thus it is deleted. The hypothesized second-order factor model presented in Figure 3 was specified in the following way: (a) each item would have a non-zero loading on the first-order factor (technical quality (TTQ), general content quality (TGQ), and appearance quality (TAQ)) that it was designed to measure and a zero loading on each of the other first-order factors; (b) error terms associated with each item would be uncorrelated; and (c) all covariance between each pair of the first-order factors would be explained by a higher order factor — which is termed website quality perceptions

The model fit statistics are: CMIN = 45.92 with df = 32, and CMIN/df = 1.435. GFI = .960, NFI = .970, CFI = .991 which are all above .90. Standardized RMR = .024 which is within the acceptable range (below .05), RMSEA = .046 with 90% confidence interval of (.000 and.074) and a PCLOSE = .558 which is a non-significant value indicating that the RMSEA value lies within the 90% confidence interval.

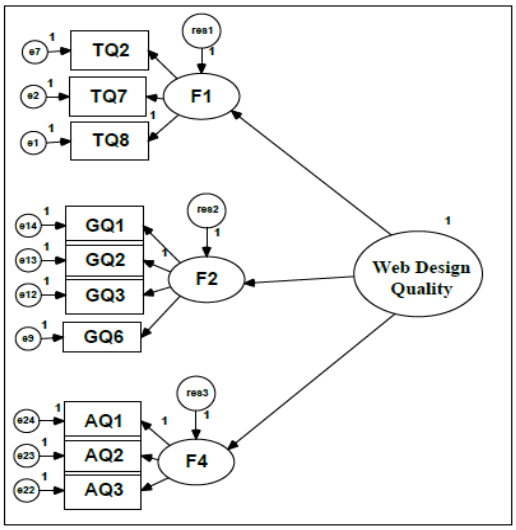

Figure 3. Web design higher order structure

As with hierarchical models, it is critical to check the identification status of the higher order portion of the model (Byrne, 2001). With three-order factors:

Sample moment = (n (n + 1)) / 2 = 6 where n = 3

Free Parameters = 0 error variances (these are set to 1)

+ 3 factor variances

+ 0 factor covariances (these are set to 0)

+ 3 regression coefficients

6 total free parameters

Degrees of Freedom = Sample moments – Free parameters = 0.

As such, the higher order level of the model is just-identified with zero degrees of freedom. Thus, prior to testing for the validity of the hypothesized structure shown in Figure 3, the just-identification issue at the upper level of the model needs to be addressed first. One approach to resolving the issue of just-identification in the model is to place equality constraints on particular parameters known to yield estimates that are approximately equal. Critical ratio differences, in AMOS output, are considered a powerful and unique exploratory mechanism for detecting candidate parameters for the imposition of equality constraints. The critical ratio differences output provides a list of estimates for the pair-wise differences among all parameters (Byrne, 2001). To determine the candidate parameters for equality constraints, variance readings in the estimates output is considered.

Table 2. Second-order factor variance: estimates, C.R, and labels for critical ratios of differences

	Estimates	C.R.	Label
Res1 (F1)	.169	5.078	Par-11
Res2 (F2)	.114	3.646	Pa1-12
Res3 (F4)	.112	3.943	Par-13

The first order residuals related to F2 (TGQ), and F4 (TAQ) has estimated values that are almost identical; however, the estimate reading related to F1 (TTQ) residual is not far different from the other two. The final decision on which parameters to constrain as equal must be determined from the actual critical ratio difference values, which are extracted from the AMOS output: par11- par12 (-1.120); par 11- par13 (-1.24); par12 – par13 (-.041). By comparing the critical ratios to the standard normal distribution (to test whether the two parameters are equal in the population), and given that the values are less than 1.96, the hypothesized pair-wise variance equality could not be rejected. Thus, it seems reasonable to constrain variances related to the three residuals to be equal. As such, the higher order level of the model will be over-identified with two degrees of freedom. In other words, the variance will be estimated for one residual and then the same value will be held constant across the other two residual variances (Byrne, 2001).

After re-specifying the model, a run of the model goodness of fit statistics resulted in readings: CMIN = 47.832 with df = 34 and CMIN/df = 1.407. GFI = .958, SRMR = .0272. NFI =.969 and CFI = .991. RMSEA = .045 with 90% confidence interval (.000 and .072) and a PCLOSE = .595, indicating a good fit. Additionally, all factor loadings are above .7 and the SMCs are above 0.6. Thus, based on these results, the model can be considered to best represent the structure of website quality item scores for the UK sample.

Having established an acceptable level of model fit, the next step is to introduce the higher-order factor, website quality perceptions

4.2 Part Two: Incorporating the Higher-Order in the UTAUT Research Model

The proposed extension to the UTAUT model is examined through CFA using structural equation modelling (SEM). The procedure comprises two stages: the measurement model and the structural model.

4.2.1 Stage One: Measurement Model

Running the CFA for the research model after incorporating the website quality perceptions higher–order structure and applying the refinement criteria mentioned previously resulted in the measurement model depicted in Figure 4.

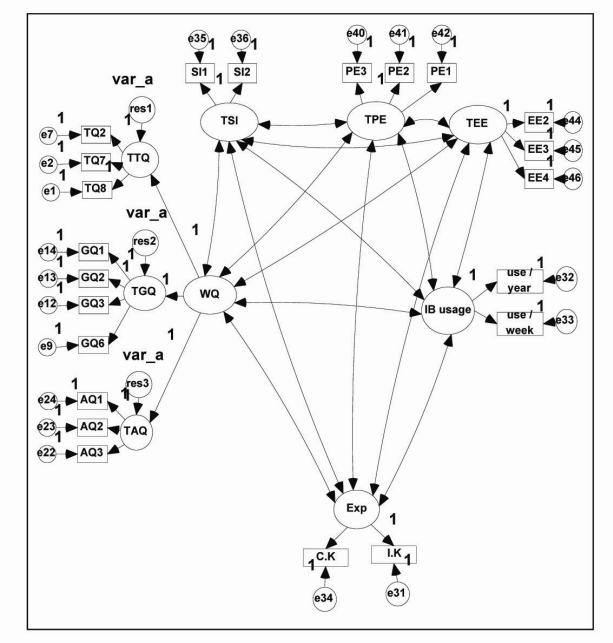

Figure 4. Measurement model with higher-order structure

The model fit statistics are indicative of a good fit: CMIN = 293.707 with df = 195, and CMIN/df ratio = 1.506. GFI = .891 and SRMR = .0545. NFI = .921 and CFI = .972. RMSEA = .050 with 90% confidence interval (.038 and .061) and PCLOSE = .506. As Table 3 shows, all standardized loadings estimates are above .7 except for one, which does not seem to significantly harm model fit or internal consistency; the SMCs are all above 0.5 and the reliability estimates all exceed 0.7 (only the internal consistency reliability for IB usage is below .70), supporting convergent validity.

Table 3. Standardized factor loadings (regression weights), variance extracted (SMC's), and reliability estimates

	TGQ	TAQ	TTQ	TPE	TEE	TSI	EXP	IB usage
GQ1	.85							
GQ2	.85							
GQ3	.88							
GQ6	.74							
AQ1		.83						
AQ2		.90						
AQ3		.86						
TQ8			.88					
TQ7			.86					
TQ2			.79					
PE1				.86				
PE2				.94				
PE3				.89				
EE2					.89			
EE3					.89			
EE4					.81			
SI1						.87		
SI2						.97		
I.K							.97	
C.K							.90	
U / W								.63
U/yrs								.86
AVE	70.0%	74.7%	71.7%	80.6%	74.9%	84.5%	87.1%	56.9%
Reliability	.90	.89	.88	.92	.90	R=.84	R=.93	R=.54

TGQ = TotalGQ etc. EXP = Experience, AVE: Average Variance Extracted.

Table 4 indicates that the squared roots of the shared variance between the constructs and their measure are higher than the correlations across constructs, supporting discriminant validity.

Table 4. Selected AMOS text output for implied (all variables) correlation matrix

	TSI	TEE	TPE	Exp	IB usage	WQ	TAQ	TGQ	TTQ
TSI	.85	0.06	0.06	0.06	0.10	0.19	0.14	0.14	0.14
TEE	.24	.75	0.52	0.39	0.40	0.28	0.20	0.20	0.20
TPE	.25	.72	.81	0.24	0.48	0.39	0.28	0.28	0.28
Exp	.25	.63	.49	.87	0.30	0.10	0.08	0.08	0.08
IB usage	.32	.63	.69	.55	.57	0.37	0.28	0.28	0.28
WQ	.44	.53	.62	.32	.61	.74	0.734	0.73	0.73
TAQ	.37	.45	.53	.28	.52	.86	.75	0.54	0.54
TGQ	.37	.45	.53	.28	.52	.86	.74	.70	0.54
TTQ	.37	.45	.53	.28	.52	.86	.74	.74	.72

Notes: values on the diagonal are the constructs' AVE. The values below the diagonal are the constructs' implied correlations. Values above the diagonal are the squared correlations.

4.2.2 Stage Two: Structural Model

Nomological validity examines the nature of the relationships among the website quality concept and theoretically related construct in the research structural model. Using Amos graphics, the CFA model was turned into a structural model by imposing the directional arrows reflecting the hypothesized relations among the models' variables. Running the structural model and applying the refinement criteria mentioned previously resulted in a model consisting of four constructs in addition to the higher order factor of website quality perceptions. The social influence variable proved to have no substantive impact on the other constructs. The specifications of the final model called for the deletion of this variable.

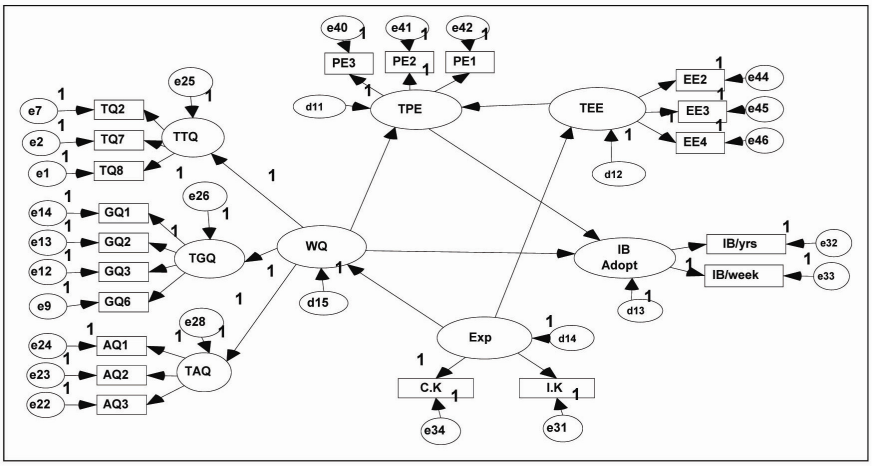

Figure 5. The structural model

e model fit indices indicate a good fit: CMIN = 239.754, df = 162 and a CMIN/df ratio = 1.480; GFI = .899 and SRMR = .0539; NFI = .929 and CFI = .975; and RMSEA = .048 with 90% confidence interval (.035 and .061) and PCLOSE =.569.

5. Hypotheses Testing and Results

Table 5 shows the detailed structural model test results. The coefficients for path EE-PE reading is significant, indicating support for H1. Social influence was predicted to directly impact performance expectancy but the coefficient was insignificant, thus not supporting H2. SI did not impact the other constructs and was deleted from the structural model.

Table 5. UK's model estimates

Hypothesis Number	Paths			Coefficient	S.E.	C.R	P	Result
H8	Exp	→	WQ	.288	.064	4.487	***	supported
H6	Exp	→	TEE	.446	.059	7.564	***	supported
H1	TEE	→	TPE	.751	.096	7.812	***	supported
H5	WQ	→	TPE	.455	.094	4.821	***	supported
H4	WQ	→	IB usage	.437	.145	3.021	.003	supported
H3	TPE	→	IB usage	.616	.103	5.966	***	supported

Note: *** p<.001; ** p<.01; * p<.05.

H3 posited that PE would mediate the relationships between EE-IB usage and SI-IB usage. However, since H2 was not supported, H3 is partially supported. Website quality perceptions were posited to have an indirect impact through PE (H4) and a direct impact on IB usage (H5). The coefficients for the former paths are significant, thus supporting H4 and H5. Experience was posited as an antecedent to major constructs in the model. The hypothesized impact of experience on effort expectancy (H6); performance expectancy (H7) and website quality perceptions (H8) was significant. Although the impact of experience on effort expectancy was positive, it was a model specification search choice to exclude that path.

6. Discussions and Conclusions

6.1 Discussions

The website quality structure: The testing and validation of website quality perceptions as a multidimensional construct using CFA produced specifications that retained a good representation for each of the four dimensions (three items per variable) and good model fit indices. Thus, website quality is best represented by a multidimensional structure instead of a unidimensional construct. The elements of website quality dimensions that were highly rated by respondents are: ease of navigation, access and loading time (technical quality); content usefulness, competence, clarity and accuracy (general content quality); and attractiveness, organization and readability (appearance quality). These findings confirm prior internet banking research (e.g., Jun & Cai, 2001; Pikkarainen et al., 2004).

SI-PE impact: the impact of social influences on performance expectancy was non-significant. This result is consistent with previous research, which indicated that the impact of social influence on perceived usefulness tends to vanish under voluntary usage conditions and users may depend on their own beliefs rather than on others' opinions or may use their direct experience with a system to form their intentions or perceptions of usefulness (Morris & Venkatesh, 2000; Taylor & Todd, 1995b; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Karahanna and Straub (1999) argued that inexperienced potential system adopters are influenced by social norms more than are current experienced users. The current study investigated individual actual experienced users of internet banking under discretionary usage conditions. Social norm is similar to social influences in the UTAUT as the case with perceived usefulness and performance expectancy (Venkatesh et al., 2003). The insignificant impact of social influence on performance expectancy result confirms previous findings reported in literature.

Comparison of findings with the TAM 1: the estimates output revealed a significant link between EE-PE, which is equivalent to that between the TAM's constructs, PEOU-PU. Literature has indicated the impact of perceived ease of use on behavioural intention and usage to be inconsistent. Systems' complexity and the role of experience as a moderator were cited as reasons behind such inconsistency (Igbaria et al., 1997; Sun & Zhang, 2006). In other words, perceived ease of use has an influence on usage or behavioural intention when technology is more complex and individuals are less experienced. In the current study, respondents are actual users; hence it is assumed that they have system experience and do not find it complex. Prior research has also shown perceived ease of use to be a significant antecedent of perceived usefulness that can affect acceptance of systems indirectly through perceived usefulness (Davis et al., 1992). Literature also reports PU as a strong, or even the most important determinant of usage. In the current study, the PE-IB usage link is supported and PE has the highest standardized direct effect (.513) on usage behaviour. The current study found support for the mediating role of PE with respect to EE-IB usage relationship while the mediating role of PE between SI-IB usage was not supported as SI-PE (H2) was non-significant.

WQ Impact: in the current study, the website quality dimension replaced the technological resources of

facilitating conditions in Venkatesh et al.'s (2003) UTAUT model. Results demonstrate that website quality perceptions have both a direct and indirect impact on usage behaviour. The standardized direct impact WQ-IB usage is .265 while WQ-PE (.331). However, WQ-IB usage standardized total effect (.536) is higher than that of PE-IB usage (.513), indicating that WQ exerts a greater impact on usage behaviour than does PE. These results confirm findings from previous research: website quality (referred to as information system quality) was reported to impact PU (Ahn et al., 2007; Lin & Lu, 2000; Yi & Jiang, 2007). Internet banking research reports similar results: website quality features such as access, navigation, and speed are determinants of internet banking adoption as well as perceived usefulness (Jaruwachirathanakul & Fink, 2005); perceived usefulness and information on online banking are the main factors influencing online banking acceptance (Pikkarainen et al., 2004).

The role of Experience's: prior research has established the importance of actual behaviour experience in the development of beliefs such as perceived ease of use (Davis et al., 1989, Venkatesh & Davis, 1996). It is also assumed that with increasing computer and internet knowledge experience, individuals are expected to fine-tune their system-specific perceived ease of use to reflect their interaction with the system or, as in this case, online access in general (Venkatesh, 2000). In the current study, experience was found to impact effort expectancy directly whereas its impact on performance expectancy was indirect through effort expectancy. The mediating role of effort expectancy is logical: individuals' past computing and internet knowledge would enable them to make judgments about sites' effort expectancy and hence sites' performance expectancy. Results from information system studies generally indicate a positive relationship between information system experience and ease of use and usefulness (Nysveen & Pedersen, 2004). The impact of prior experience on website quality perception also confirms previous IS research that reports experience as an antecedent to perceived behavioural control (TPB model: Taylor & Todd, 1995a), which is similar to facilitating conditions (UTAUT model: Venkatesh et al., 2003; Venkatesh et al., 2008).

Finally, the output for squared multiple correlations shows that the extended research model explains 50% of actual internet usage behaviour. The authors of the UTAUT report an explanation power of 70% taking into account the effect of moderators (Venkatesh et al., 2003). The present study is not reporting the effect of moderators, and using a different analytical approach. Correspondingly, TAM is reported to explain 40% of intentions to use and 30% of actual use (Burton-Jones & Hubona, 2005), while the current proposed extension produced an explanation power exceeding the reported percentage for actual usage.

6.2 Conclusions

The results demonstrated that website quality perceptions are a multidimensional concept that can be presented as a higher-order structure. Results also indicated that website quality structure has an impact (directly and indirectly) on online usage behaviour and that its total impact is greater than that of any other construct in the model. The results also suggested that the previously established links among TAM's constructs are also valid among UTAUT constructs. As such, this work has added to the understanding of technology adoption within theories of technology acceptance research and in discretionary online behaviour contexts. The extended model provides an avenue to conceptualize how various web design quality choices might influence overall website quality perceptions through the attributes of the four quality dimensions. This provides an approach for linking website quality perceptions to their ultimate effects on systems effort expectancy, performance expectancy, and usage in the context of the internet banking environment.

7. Contribution and Limitations

7.1 Contribution

This research makes both theoretical and practical contributions. The first theoretical contribution lies in the validation of the website quality as a higher order structure. The dimensions developed by Aladwani and Palvia (2002) were tested and validated as a first-order structure. In the current study, such treatment failed to measure the expected influence of these dimensions on related constructs in the research model. The interrelationships among the four dimensions led to the higher-order structure presentation. The second theoretical contribution is the extension to the UTAUT model achieved by incorporating the website quality higher order structure to account for the quality characteristics of online presence that induce online behaviour. This research shows evidence that the aggregated technology model can be effective in accounting for usage behaviour, especially within the online context and the proposed model extension. The research also provided a theoretical understanding of how perceptions of the website quality dimensions (e.g., ease of navigation, access and loading time; content usefulness, completeness and clarity; and appearance attractiveness, organization and readability) are considered important features of a bank's web design among users in the UK. Additionally, the research

demonstrated the role of website quality perceptions and their impact on the beliefs structure in the UTAUT model on one hand, and ultimate system usage behaviour on the other.

From the implementation analysis perspective, the current work validated the UTAUT measures in addition to supporting the interrelationships among the key constructs in technology acceptance research. The current research contributes to theory by providing a new perspective to the UTAUT by exhibiting that previously established relationships among TAMs' constructs are also valid between the key constructs in the UTAUT within the context examined. This is considered a new addition to our understanding with respect to the unified theory of acceptance and use of technology. From an empirical analysis perspective, the research utilized a structural equation analytical technique that permits a concurrent assessment of the adequacy of the measurement model and the conceptual model used to assess the target behaviour. Specifically, the research employed confirmatory factor analysis to validate the measurement model with the higher-order structure incorporated in the proposed research model.

7.2 Limitations

A limitation of the present study is that it was examined within the specific domain of internet banking; it is uncertain whether or not the findings can be applied more broadly to other forms of technology in other countries. Another limitation is the use of cross-section survey. While acknowledging these limitations, it does not in any way compromise the significant findings in this study pertaining to role of website design in influencing individuals' usage of Internet banking. As outlined below, these limitations are outweighed by the implications for practitioners and the avenues opened up for future research.

8. Implications and Recommendations

Managers and developers can benefit from the current findings by reinforcing users' decisions; maintaining the quality of highly rated features of the website quality dimensions; communicating these features to potential users; and making their web applications and services more engaging and commercially viable.

Decision makers within the financial sector can visualize the role of beliefs in forming actual usage behaviour. The findings showed that experienced users relied on their perceptions of performance expectancy and website design quality to make decisions about system usage. In this study, the benefits accumulated in perceptions of performance expectancy, such as speed, time and efficiency, are highly valued by users; second only to their perceptions of web design quality. The implication here for practitioners is to build on these features and merits in attracting non-users and reinforcing the decision of actual users by maintaining and improving such characteristics of efficiency.

Several implications are present for future research. First, this research was successful in validating the measures and higher order structure of the website quality perceptions construct. However, the need persist for further research to cross validate these findings in other contexts. Second, the extended UTAUT model might be applied to other online behaviour such as e-commerce or e-shopping. Third, given that most current research is still focused on TAM, the UTAUT model as a parsimonious, aggregated form of eight dominant technology acceptance models may well form the vehicle for a change of direction. The authors encourage researchers to investigate the effects of the website quality aspects as antecedents to performance expectancy, effort expectancy and related usage behaviour. The current research model suggests ways in which this can be accomplished. Previous IS research examined the impact of system and information quality on system use and user satisfaction. Nevertheless, the dimensions of website quality examined in this current study are more broad and comprehensive than previously reported, opening up opportunities for future research.

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