



Electronic service quality: An empirical investigation in Saudi Arabia

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ABSTRACT

Despite the increase of Internet users and the development of web based technology and infrastructure, electronic services in developing countries is not yet very diffused and well used compared with other developed regions. In fact, the issue related to the determinants of service quality in the e-banking context is still subject of debate, particularly in Saudi Arabia. Also, few studies examine the antecedents and consequences of electronic service quality in an integrated model. Thus, in this study we will try to respond to this gap.

Keywords: TAM; SERVQUAL; Unified theory of acceptance and use of technology (UTAUT); service quality; Internet banking; technology use.

1. INTRODUCTION

Electronic banking has fundamentally transformed the delivering of services and the way to deal with customers (Yadav and Pavlou, 2014). It has offered many possibilities to complete transactional activities in a cost effective way with more flexibility and regardless of the physical location of the bank (Hanafizadeh, Keating, and Khedmatgozar, 2014; Goh, and Kauffman, 2013). In addition, Internet is used more frequently in the banking sector to offer new electronic services and it plays an important role in retaining valuable customers (Yadav and Pavlou, 2014, Vatanasombut, et al. 2008; Liao and Cheung, 2002). Now, most banks, especially in Saudi Arabia, have deployed web based technology systems in order to improve their interactions with customers and to reduce their costs (Hanafizadeh, Keating, and Khedmatgozar, 2014; Safeena, Kammani, and Date, 2014; Mishra, and Singh 2014; Al-Ghaith, Sanzognim and Sandhu, K. (2010).

Despite the increase of Internet users and the development of web based technology and infrastructure, today e-banking in developing countries is not yet very diffused and well used compared with other developed regions (Hanafizadeh, Keating, and Khedmatgozar, 2014; Hoehle, Scornavacca, and Huff, 2012). Especially, the issue related to the determinants of e-service quality in the banking context is still object of debate, particularly in Saudi Arabia. Also, few studies examine the antecedents and consequences of electronic service quality in an integrated model. Thus, in this study we will try to respond to this gap.

This paper is organised as follows. First, we present an overview of the state of electronic banking services in Saudi Arabia. After that, we discuss the evolution of the service quality concept and its link with the internet environment. Then, we discuss the consequence of the service quality and we present our hypotheses. In the next section, the method, measures, and results of the study will be exposed. Finally, we present the conclusion and future research directions in the end of the paper.

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2. E-BANKING SERVICES IN SAUDI ARABIA

While there are many terms to identify e-services, in this paper it refers to the banking services delivered electronically and exclusively through the Internet. Other channels may deliver electronic services such as ATM and mobile phone, but we are interested here exclusively on the services supported only by the web site of the banks.

E-banking represents a variety of electronic services as managing current account, paying bills, transferring funds, printing statements, and inquiring about account balances (Hanafizadeh, Keating, and Khedmatgozar, 2014; Safeena, Kammani, and Date, 2014; Mishra, and Singh 2014). Also, electronic banking constitutes a platform to support other commercial solutions, as well as online shopping, online auction, and online stock trading.

Delivering services online offers many benefits to the banks such as cost savings compared to traditional channels, the reduction of branch networks and the opportunity of mass customization.

Other advantages provided to the customers can be cited. There is an increase in the autonomy, a less dependency on bank's branch, more flexibility in doing banking transactions, and consequently, saving time and effort for the clients (Martins, Oliveira, and Popovič, 2014; Hanafizadeh, Keating, and Khedmatgozar, 2014; Safeena, Kammani, and Date, 2014; Mishra, and Singh 2014).

For the Saudi Banks, the electronic services present an opportunity to face challenges in this evolutionary domain and can be viewed as new way to raise the competitive capability of the firm. In order to satisfy 20 million of Saudis people and a 10 million of expatriates¹, Saudi banks are looking for new ways to perform their activities and are exploring different distribution channels.

Furthermore, Saudi population is largely dominated by young individuals who are more willing to use Internet technologies easily and so, are more inclined to interact online with their banks (Sohail, and Al-Jabri, 2014). In fact, Internet penetration is on constant rise in Saudi Arabia, creating therefore a higher demand on electronic banking services. According to the report published by the Central Department of Statistics and Information in 2013, the number of Internet users in the Kingdom of Saudi Arabia continues to raise rapidly, reaching about 18.1 million at the end of first quarter of 2014, with a population penetration of 58.1%.

The development of internet use by Saudi people is considered as an important factor for the diffusion of electronic banking services. In fact, different services are provided online via the web sites of the banks as account management, payment of bills, personal loans, brokerage services, mutual funds, issuance of credit cards, etc.,

This electronic channel is added to the traditional interaction system including branches, ATM networks, and telephone based services.

3. SERVICE QUALITY IN E-SERVICE CONTEXT

The service quality literature has been developed by marketing researchers to evaluate the customer perceptions of the service provided by a vendor in the personal environment (Parasuraman, Zeithaml, and Berry, 1985). According to these researchers, service quality represents a customer's global, subjective assessment of the quality of an interaction with a vendor, including the degree to which specific service needs have been met (Parasuraman, Zeithaml, and Malhotra, 2005).

Later, the marketing studies about service quality have been used by information systems researchers to assess the quality of the service delivered by the IS department (Pitt, Watson, and Kavan, 1995). So, the users of the information systems take the place of customer, and the IS department is considered as an internal service provider.

After that, several studies have integrated service quality as a determinant of user satisfaction. For example, Pitt, Watson, and Kavan (1995) added service quality as a new dimension to DeLone and McLean (1992) to explain information technology use and user satisfaction. Likewise, DeLone and McLean (2003) proposed an updated IS success model in which service quality construct influences the IT use either directly or indirectly via user satisfaction.

With the increasing service functionalities delivered online, especially in e-service context such as e-banking, the attention was turned more on the customer use than on the technology or system user. So, service quality will represent not only the technical concern, but the support delivered by the technology become more important. Some mentioned that electronic environment has shifted the focus on the IT from internal management tools to customer directed applications (Straub and Watson 2001). Consequently, the deployment of information technology will be increasingly characterized not only by technical issues, but as well by service quality issues (Koufaris 2002; Straub and Watson 2001).

¹ <http://www.cdsi.gov.sa/>

Previous research have mentioned that in the e-service context, it is more difficult to separate service quality from the system itself and from the information delivered, since they are all computer-mediated (Xu, Benbasat, and Cenfetelli, 2013). Other studies have outlined earlier that service quality is more important in virtual environment than ever before, because user become consumer rather than employee, and thus poor support leads to low use and then loss of customers (Peter, DeLone, and McLean, 2013; DeLone and McLean, 2004).

Xu, Benbasat, and Cenfetelli (2013) have noted that service quality in the online environment reflects the overall support delivered by and via the Internet interfaces. This idea is increasingly shared by different authors who consider that service quality represents more the effectiveness of the support capabilities than the quality of the system itself (Petter, DeLone and Mclean, 2008; DeLone and McLean, 2004).

We conceptualize perceived SQ as a consumer's overall evaluation of the service provision of a website. This definition is based on the conceptualization that evaluation of service quality must include considerations of both content and delivery (Xu, Benbasat, and Cenfetelli, 2013). When a customer perceives a higher quality of what is offered (i.e., content) and a higher quality of how it is offered (i.e., delivery) in a website, the customer's perceived SQ will also be higher. Empirically, prior research has confirmed that perceptions of service content and service delivery are two important predictors of customers' perceived SQ (Xu, Benbasat, and Cenfetelli, 2013).

While previous models such TAM (Venkatesh, and Davis, 2000) and UTAUT (Venkatesh et al., 2003; Venkatesh, et Zhang, 2010) focus on technical quality to explain attitude and behavioral intention to use IT, they leaves out important variables reflecting support capabilities (Xu, Benbasat, and Cenfetelli, 2013). Delone and McLean (2003), among others, have called for the inclusion of service quality factors to well understand of behavioral intention and use of IT, especially in online service context. Service quality which includes both content and delivery of electronic service goes beyond individual characteristics and system features to predict the adoption of Internet-based technologies. Empirically, many studies have used service quality factors as antecedents of attitude and intention toward using Internet technologies either directly (Sambasivan, Wemyss, and Rose, 2010; Wangpipatwong, Chutimaskul, and Papisratom, 2009) or indirectly (Elmorshidy, 2013; Xu, Benbasat, and Cenfetelli, 2013).

4. CONSEQUENCES OF SERVICE QUALITY

Wixom and Todd (2005) theorize and empirically support the influence of quality on satisfaction. Service quality, especially, is widely supported in the marketing literature as a determinant of service satisfaction. In e-service context, Xu, Benbasat, and Cenfetelli (2013) found that perceived service quality influences service satisfaction. Thus, we predict that service quality, which is an object-based belief, influences attitudes about service satisfaction in e-banking context. Thus, we propose the following:

H1: perceived service quality has a positive effect on service satisfaction.

Perceived usefulness represents the extent to which potential users expect the use of an information system to improve their task performance (Davis, 1989). Within online shopping context, perceived usefulness refers to the degree to which a customer believes a website helps them achieve their shopping goals (Cenfetelli et al. 2008). In e-service context, perceived usefulness refers more to the performance expectancy which is defined as the degree to which using a web based-technology will provide benefits to consumers in performing certain online activities (Xu, Benbasat, and Cenfetelli, 2013). Also, perceived ease of use refers to the degree of ease associated with consumers' use of web based technology (Venkatesh, Thong, and Xu, 2012). Wixom and Todd (2005) found that user satisfaction influences behavioral beliefs such as usefulness and ease of use. For example, Xu, Benbasat, and Cenfetelli (2013) note that service satisfaction represents an object-based attitude that serves as an external variable shaping behavioral beliefs. They found that perceived usefulness serves as consequential behavioral belief of service satisfaction. The link from satisfaction to usefulness and ease of use is also supported from other studies considering that online shopping provide a utilitarian value through responses evoked during the online experience (Voss et al. 2003). We expect that service satisfaction will influence perceived usefulness and perceived ease of use. That is, the higher the satisfaction with the service provided, the more likely the customer will find the experience of using the website to be easily and useful. Moreover, according to Technology Acceptance Model (TAM), perceived ease of use influences perceived usefulness.

Thus, we propose the following:

H2: user satisfaction has a positive effect on perceived usefulness.

H3: user satisfaction has a positive effect on perceived ease of use.

H4: perceived ease of use has a positive effect on perceived usefulness.

TAM used the Theory of Reasoned Action as a theoretical basis to explain information technology acceptance and use. The Attitude towards using information technology in TAM is determined by perceived ease of use and perceived usefulness. These two beliefs create a favorable behavioral intention toward using this technology which is consequently affects its actual use. Others studies found that ease of use and usefulness are determinants of behavioral intention to use

electronic services (Martins, Oliveira, and Popović, 2014; Riffai, Grant, and Edgar, 2012). Thus, we propose the following:

H5: perceived ease of use has a positive effect on behavioral intention of continued use of electronic services.

H6: perceived usefulness has a positive effect on behavioral intention of continued use of electronic services.

5. DATA COLLECTION AND MEASUREMENT

In this study, we will test the hypotheses in e-banking context as an electronic environment. A snowball sample method is used in this research because this sampling method is suitable to the Saudi Arabian context (Sohail and Shaikh, 2008). A questionnaire was distributed by the researchers to colleagues, students and university staff who are current users of electronic banking services. The questionnaire was firstly built in English and the final version was translated into Arabic. In order to ensure the equivalence of measurements in the two languages, the translation was reviewed by a third party. The questionnaire was finalized after correcting a few minor differences in wording in the two languages. Overall, 420 questionnaires were distributed hand to hand and 133 usable questionnaires were received (response rate of 32%).

The sample is composed almost equally between women and men. 76% of the respondents have more than four years of Internet experience, about 70% of them occupied the function of supervisor or manager, and are educated (Bachelor's degree or higher). All of the measures used were adopted from prior research. Perceived ease of use (PEOU), perceived usefulness (PU), and behavioral intention of continued use (BI) are adapted from Venkatesh, Thong, and Xu (2012). Service quality (SQ) represents a second order construct integrating the four following constructs: website design (WD), customer service (CS), reliability (RI), and security (SE). Satisfaction (SAT) is measured with one item construct. These measures were adapted from Wolfinbarger and Gilly (2003). All items were measured using a seven-point Likert scale, with the anchors being "strongly disagree" and "strongly agree".

6. DATA ANALYSIS AND RESULTS

In this study, we use Partial Least squares (PLS) which is a more "regression-based" approach that minimizes the residual variances of the endogenous constructs (Hair, Ringle, and Sarstedt, 2011). The PLS algorithm first optimizes measurement model parameters and then, in a second step, estimates the path coefficients in the structural model. Because of its prediction orientation, this method is suitable when the research objective is theory development and prediction (Hair, Ringle, and Sarstedt, 2011). The PLS approach represents a one-step technique, requires no additional specification of parameter constraints or assumptions of multivariate normality, can be used to estimate large complex models, and estimates standard errors via resampling procedures (Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). Smart PLS 3 (Ringle, Wende, & Will, 2015) is the software used in this study.

6.1. Evaluation of measurement model

Reflective measurement models should be assessed with regard to their reliability and validity. Construct reliability can be assessed using the composite reliability as an estimate of a construct's internal consistency (Wetzels, Odekerken-Schroder, and Van Oppen, 2009; Hair, et al. 2012). Unlike Cronbach's alpha, composite reliability does not assume that all indicators are equally reliable, making it more suitable for PLS-SEM, which prioritizes indicators according to their reliability during model estimation. Composite reliability should be higher than 0.7 (Hair, Ringle, and Sarstedt, 2011; Hair, et al. 2012). In our case, the composite reliability of our constructs is above the recommended cutoff of .70 and the alpha values exceed the cutoff value of .70 as shown in table 1.

Also, each indicator's reliability needs to be taken into account, whereby each indicator's absolute standardized loading should be higher than 0.70 (Hair, Ringle, and Sarstedt, 2011). In our case, all loadings are greater than 0.7 and are significant at 5%. Reflective measurement models' validity assessment focuses on convergent validity and discriminant validity (Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). For convergent validity, the average variance extracted (AVE) is examined. An AVE value of 0.50 and higher indicates a sufficient degree of convergent validity, meaning that the latent variable explains more than half of its indicators' variance (Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). As is seen in table 1, AVE for each construct is above the expected threshold of 0.5, ensuring convergent validity. For the assessment of discriminant validity, two measures are used: the Fornell-Larcker criterion and cross loadings (Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). The Fornell-Larcker criterion indicates that a latent construct shares more variance with its assigned indicators than with another latent variable in the structural model. Technically, To assess discriminant validity, the square root of AVE should be greater than the correlations between the constructs (Hair et al. 2012; Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). This criterion is verified as shown in table 2 below.

The second criterion of discriminant validity refers to the cross-loading. An indicator's loading with its associated latent construct should be higher than its loadings with all the remaining constructs (Hair, Ringle, and Sarstedt, 2011).

We found also that no indicator has loadings with lower values than their cross loadings showing that all the loadings of the measurement items on their assigned latent variables are larger than any other loadings.

In summary, our measurement model satisfies the reliability and validity criteria. Thus, the constructs described above could be used to test the associated hypotheses proposed earlier.

Table 1. AVE, composite reliability, and cronbach alpha

	AVE	Composite Reliability	Cronbach Alpha
BI	0.913	0.969	0.952
CS	0.820	0.932	0.890
PEOU	0.848	0.944	0.910
RI	0.861	0.949	0.919
PU	0.755	0.902	0.835
SE	0.928	0.975	0.961
SQ	0.603	0.948	0.940
WD	0.781	0.914	0.860

Table 2. Discriminant validity

	BI	CS	EOU	FI	PU	SAT	SE	SQ	WD
BI	0.955								
CS	0.573	0.906							
PEOU	0.586	0.526	0.921						
RI	0.530	0.601	0.583	0.928					
PU	0.670	0.486	0.680	0.478	0.869				
SAT	0.602	0.826	0.529	0.631	0.573	1.000			
SE	0.682	0.665	0.422	0.564	0.423	0.612	0.963		
SQ	0.716	0.861	0.638	0.851	0.558	0.792	0.825	0.777	
WD	0.631	0.632	0.640	0.717	0.503	0.598	0.531	0.842	0.884

6.2. Evaluation of Structural model

To evaluate the structural model, we focus mainly on the R^2 measures and the level and significance of the path coefficients (Hair, Ringle, and Sarstedt, 2011). Because PLS-SEM approach has to explain the endogenous latent variables' variance, the key target constructs' level of R^2 should be high. In general, R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables in the structural model can, as a rule of thumb, be described as substantial, moderate, or weak, respectively (Hair, Ringle, and Sarstedt, 2011). The individual path coefficients of the PLS structural model can be interpreted as standardized beta coefficients of ordinary least squares regressions (Hair, Ringle, and Sarstedt, 2011; Henseler, Ringle, and Sinkovics, 2009). Just as with the indicators' weights and loadings, each path coefficient's significance can be assessed by means of a bootstrapping procedure. For each effect in the path model, one can evaluate the effect size by means of Cohen's (1988) f^2 .

The effect size f^2 is calculated as the increase in R^2 relative to the proportion of variance of the endogenous latent variable that remains unexplained (Henseler, Ringle, and Sinkovics, 2009). f^2 values of 0.02, 0.15, and 0.35 signify small, medium, and large effects, respectively (Henseler, Ringle, and Sinkovics, 2009). Table 3 and table 4 show the R^2 and f^2 values respectively in our model presented in figure 1.

Table 3. R² values

	R Square
BI	0.480
CS	0.741
PEOU	0.280
RI	0.725
PU	0.525
SAT	0.627
SE	0.680
WD	0.709

Table 4. f² values

	BI	CS	EOU	FI	PU	SAT	SE	SQ	WD
BI									
CS									
PEOU	0.061				0.416				
RI									
PU	0.264								
SAT			0.389		0.133				
SE									
SQ		2.859		2.634		1.681	2.128		2.432
WD									

We calculate t-statistics derived from bootstrapping (300 iterations). Path coefficients are presented in figure 1, and t statistics and p values are presented in table 5. All hypotheses are supported in this study as shown in Table 5. We found that service quality (as a second order construct) has positive effect on service satisfaction ($\beta= 0.792$; $p< 0.001$). Service satisfaction has a positive effect on both perceived usefulness ($\beta= 0.296$; $p< 0.05$), and perceived ease of use ($\beta= 0.529$; $p< 0.001$). Perceived usefulness influences positively behavioral intention ($\beta= 0.505$; $p< 0.001$). Perceived ease of use has a direct positive effect ($\beta= 0.243$; $p< 0.05$) and indirect effect ($\beta= 0.264$; $p< 0.05$) on behavioral intention of continued of electronic services.

Figure1: Path coefficients of the model

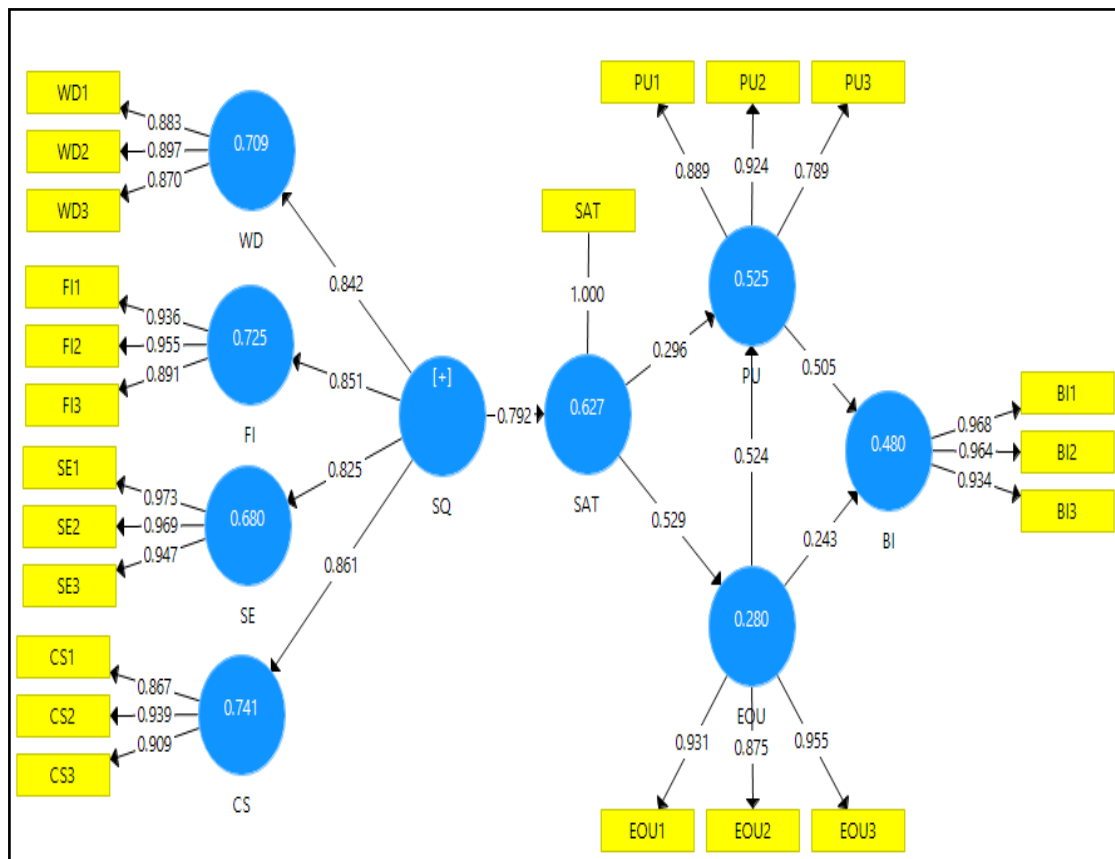


Table 5. T statistics an p values of path coefficients

	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics ((O/STERR))	P Values
PEOU -> BI	0.243	0.235	0.105	2.301	0.022
PEOU -> PU	0.524	0.533	0.100	5.223	0.000
PU -> BI	0.505	0.505	0.123	4.089	0.000
SAT -> EOU	0.529	0.524	0.090	5.848	0.000
SAT -> PU	0.296	0.284	0.109	2.714	0.007
SQ -> CS	0.861	0.861	0.031	27.376	0.000
SQ -> FI	0.851	0.855	0.027	31.145	0.000
SQ -> SAT	0.792	0.792	0.044	17.899	0.000
SQ -> SE	0.825	0.828	0.032	25.853	0.000
SQ -> WD	0.842	0.842	0.034	24.732	0.000

7. DISCUSSION

Our study supported the indirect positive effect of service quality on behavioral intention via ease of use and usefulness ($\beta = 0.331$; $p < 0.001$). Other studies found the same results (Elmorshidy, 2013; Xu, Benbasat, and Cenfetelli, 2013).

Service quality encompasses four aspects which reflect the capability of the website to provide in-depth information about e-services and allows customer to complete a variety of transactions quickly and safely. Also, the dimension of service quality cover the content and the delivery of bank's website, and are used successfully to assess the quality for Internet banking services (Gupta, and Bansal, 2012, Herington, and Weaven, 2009, Sohail, and Shaikh, 2008). Empirically, several studies found that service quality factors influence the use of Internet-based technologies either directly (Sambasivan, Wemyss, and Rose, 2010; Wangpipatwong, Chutimaskul, and Papasratorn, 2009) or indirectly (Elmorshidy, 2013; Xu, Benbasat, and Cenfetelli, 2013). The security dimension, as important dimension in the banking context, reflects the ability of the web site to ensure privacy and to protect sensitive information by offering adequate security features and procedures.

Past studies outlined the importance of security as significant antecedent of electronic banking adoption (Gupta, and Bansal, 2012, Herington, and Weaven, 2009, Sohail, and Shaikh, 2008).

Our results demonstrate also that perceived usefulness and perceived ease of use are important determinants of behavioral intention in e-service banking context. This demonstrates that customers of e-banking services are worried about the performance expected and the ease of use of the system. This result reinforces the believe that e-banking is seems to be a useful web-based technology which can provide many benefits to consumers in performing their banking activities in easily way . This finding is consistent with the results of prior studies (Riffai, Grant, and Edgar, 2012; Martins, Oliveira, and Popović, 2014).

8. CONCLUSION

This research shows that the users of electronic banking services are goal oriented who focused essentially on the usefulness of technology and ease of use. The performance and effort are the primarily concern of customers and they determine the behavioral intention of continued use in the future. Thus, banks should concentrate on this issue and they are applied to pay more attention for developing the bank's web site functionalities to provide more suitable services and features in order to improve the usefulness and the ease of use of the online system.

In addition, the results of this study reveal that service quality model improve our knowledge about the end-user intention to use electronic banking services. We found that service quality, as multidimensional construct, influences service satisfaction which is, in turn, has a positive impact indirectly on the intention of continued use.

The service quality incorporates in this study four dimensions: web design, reliability, security and customer service which cover the content and the delivery of bank's website. So, banks should be attentive to these factors by allocating necessary human and material resources to develop and maintain functionalities such as navigation, information search, transaction processing, appropriate personalization, security of payments and privacy of shared information.

While this study enhance our knowledge about the electronic banking service, some improvements can be taken in the future. For example, further research may examine the effect of moderate variables such age, gender, education level or Internet experience. In addition, future studies are appealed to test the model proposed here in other contexts (other countries and/or other technologies) to verify its robustness. Finally, further studies can integrate other factors or other models which can be suitable to enrich this one proposed here.

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