Full Length Research Paper

Understanding resistance to cell phone banking adoption through the application of the technology acceptance model (TAM)

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The resistance to the adoption of cell phone banking poses a challenge to managers in banks. Previous research on the adoption of cell phone banking did not examine how the barriers to the adoption of technology influence the behaviour of clients. This article observes how the barriers of technology adoption influence perceived usefulness and perceived ease of use. The population of the study reported in this article consisted of 288 respondents who were non-users of cell phone banking services. The results of the assessment of the structural model demonstrated that both the value barrier and the tradition barrier had a strong negative influence on perceived usefulness. The usage barrier and the information barrier also had a strong negative influence on both perceived ease of use and the value barrier. Perceived ease of use had a strong positive influence on perceived usefulness and intention to use, while perceived usefulness had a strong positive influence on behavioural intention. Recommendations on how to improve the adoption of mobile phone banking are provided.

Key words: Technology acceptance model (TAM), cell phone banking, usage barrier, value barrier, tradition barrier, information barrier.

INTRODUCTION

Banks utilize branch-based retail banking as a means of enabling customers to manage their finances. There are however, other means of enabling customers to manage their finances and one of them is cell phone banking. One of the reasons why banks made cell phone banking available to customers is that the penetration and diffusion of cellphones is high and this means that customers would have access to the service. Introducing cell phone banking to customers is valuable since such a technological service brings convenience to the customers, and offers benefits such as lower costs, saving time and making transactions anywhere (Grabner-Krauter and Faullant, 2008).

Customer attitude towards banking services has been studied by researchers such as Howcroft et al. (2002) and Liao and Cheung (2002). Brown et al. (2003) observed the factors that predict the adoption of mobile phone banking. Chung and Kwon (2009) explained the effects of customers' cell phone banking experience and technical support on the intention to use cell phone banking while Gu et al. (2009) demonstrated the various determinants of behavioural intention in cell phone banking adoption. Yu and Fang (2009) researched the post-adoption user perception of mobile phone banking, while Lee and Chung (2009) investigated the factors that affect trust in mobile phone banking.

However, regardless of all the benefits of cell phone banking, the adoption of this service is still low. According to Gartner (2007), and Luarn and Lin (2005), the adoption of mobile banking has been low because customers are resistant (Kuisma et al., 2007). It is thus important to understand why customers do not adopt mobile banking. Such information will be useful in enabling bank

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managers to formulate effective marketing strategies and hence increase customers' utilization of cell phone banking.

Although, previous studies have provided useful information on adoption behaviour with regard to cell phone banking, research that focuses on why customers resist such a service and how this resistance influences behaviour intention is limited. An understanding of why potential customers resist cell phone banking will play a critical role in solving the challenge of cell phone banking resistance as such customers represent a potential market for these services.

The question to be answered was therefore: What are the factors that negatively influence the formation of intention to adopt cell phone banking? The main objective of this study was therefore, to use the technology acceptance model (TAM) to explain how resistance factors influences the formation of intention to adopt cell phone banking and to suggest solutions in cases of negative influence.

Firstly, a theoretical framework and model development are discussed. Then, the focus falls on the research methodology employed in the study. This is followed by the discussion of results, conclusion and the limitations of the study.

LITERATURE REVIEW

Technology acceptance

Davis (1989) introduced TAM for the first time as a model that can be used to explain the determinants of acceptance of technology by customers. Researchers have found TAM to be robust in predicting technology acceptance. This was proven by King and He (2006) who conducted a meta-analysis of TAM. In their study, King and He (2006) used results from 140 papers in 22 journals. The study involved more than 12 000 observations to show that TAM is reliable and can be used in different contexts. The two determinants for acceptance of technology which were identified and validated by Davis (1989) are perceived usefulness and perceived ease of use. King and He (2006) proved that perceived usefulness and perceived ease of use are accurate in predicting behavioural intention. Venkatesh and Davis (2000) extended TAM into TAM 2 and Venkatesh and Bala (2008) extended TAM 2 into TAM 3. TAM 2 demonstrated that other variables such as subjective norm, image, job relevance, output quality and result demonstrability influences perceived usefulness. TAM 3 on the other hand demonstrated that perceived ease of use can be explained by variables such as computer self-efficacy, perception of external control, computer anxiety, computer playfulness, perceived enjoyment and objective usability as demonstrated by Venkatesh (2000). The proposed model for this study is demonstrated in Figure 1.

Perceived usefulness and perceived ease of use

The study relied on some of the findings from research on mobile banking because of the similar nature of cell phone banking and mobile banking. Davis (1989) defines perceived usefulness as the extent to which people believe that technology will help them perform the task at hand. When customers perceive that technology is useful, then they will have the intention to use it (Venkatesh and Davis, 2000). Therefore, it can be assumed that perceived usefulness leads to behavioural intentions. Yiu et al. (2007) supported this idea and mentioned that perceived usefulness positively influences behavioural intention in mobile banking.

Davis (1989) defines perceived ease of use as the extent to which people believe that using technology will be free from effort. Djamasbi et al. (2010) found that perceived ease of use positively influences perceived usefulness and behavioural intention. Perceived ease of use has a significant effect on behavioural intention (Ventakesh, 2000; Ventakesh and Morris, 2000), as well as on perceived usefulness (Luarn and Lin, 2005). According to Wang et al. (2003), perceived ease of use positively influences behavioural intention.

The following hypotheses were therefore formulated:

H_1: Perceived usefulness positively influences behavioural intention.
H_2: Perceived ease of use positively influences behavioural intention.
H_3: Perceived ease of use positively influences perceived usefulness.

Technology resistance

The early work of Ram and Sheth (1989), on resistance factors, identified two reasons why customers would resist technology innovation. Firstly, customers resist an innovation that requires them to change their daily routines. Such a change can be viewed as being disruptive. Secondly, customers will resist technology innovations if such a change conflicts with their belief structure. These reasons of resistance represent two categories of resistance factors: functional barriers and psychological barriers (Ram and Sheth, 1989). Functional barriers relate to the usage barrier, value barrier and risk barrier; while psychological barriers relate to the tradition barrier and image barrier (Ram and Sheth, 1989).

In this study, TAM was used as the salient theory to explain how factors that influence bank customers to resist adoption of cell phone banking affect their intention to use technology. Some studies have given insight into the reasons why customers resist mobile banking (Swilley, 2010; Kleijnen et al., 2009; Kuisma et al., 2007). Luo et al. (2010) demonstrated how perceived risk influences the initial acceptance of mobile banking while Zhao et al. (2008) and Durkin et al. (2007) explain how
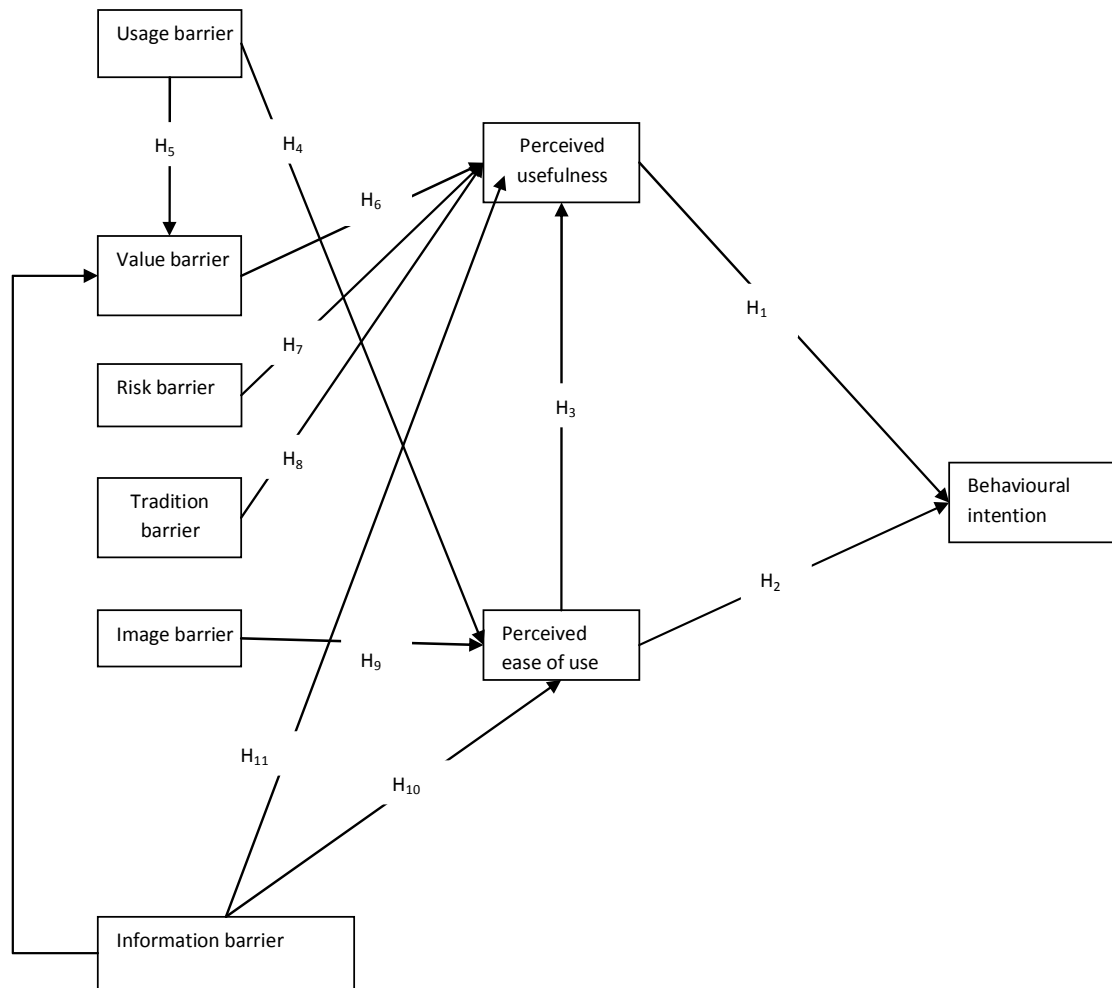
Figure 1. Proposed model.

perceived risk influences the adoption of mobile banking.

Usage barrier

According to Ram and Sheth (1989), the usage barrier occurs when technology innovation does not fit with customers' workflows, habits and practices, because more effort will be required from customers to learn and utilize such technological innovation. Ram and Sheth (1989) are also of the opinion that, the usage barrier can be the strongest cause of technology innovation resistance. Kuisma et al. findings (2007) showed that respondents who did not use mobile banking perceived such services to be difficult to use in banking activities. Furthermore, in a study by Laukkanen and Lauronen (2005) it was found that a cell phone was seen to be limited in terms of its ability to display information of the bill. The complexity of mobile banking has caused customers to perceive such services as being difficult to

use (Gerrad and Cunningham, 2003). It can therefore, be assumed that, when customers have a high perception that cell phone banking is difficult to use, they will not find such a service valuable. This would cause a usage barrier. In the study on which this research is based, a usage barrier was defined as lack of fit between customers' routine way of doing their banking transactions and the perceived difficulty of the new way of banking. Since perceived ease of use is related to the degree of complexity of technological innovation (Davis, 1989), it is expected that the usage barrier will have a negative effect on perceived ease of use.

Value barrier

A value barrier occurs when a technological innovation does not offer a strong performance-to-price value compared with competing offers (Ram and Sheth, 1989). As a result customers decide not to adopt the technology

innovation because they perceive that they will not benefit if they adopt such an innovation (Ram and Sheth, 1989). When perceived usefulness of mobile banking is low, then customers would be less likely to adopt such services (Laukkanen, 2008). For example, in instances where customers perceive that the cost of learning the technological innovation is higher than the benefits associated with it, then the value barrier will be higher (Dunphy and Herbig, 1995). Kuisma et al. (2007) point out that, customers who did not use mobile banking said that the benefits of mobile banking were not significant since connection to the Internet would be costly. Such customers regarded the costs as being higher than the benefits. This view is supported by Laukkanen et al. (2007a) who mentioned that customers who did not use mobile banking believed it to be too expensive. The value barrier can therefore, be defined as the extent to which a customer perceives that the benefits associated with cell phone banking do not justify the costs.

Risk barrier

The risk barrier explains the degree of risk associated with technological innovation (Ram and Sheth, 1989). Typically risk could be physical, economic, functional or social (Ram and Sheth, 1989). According to Ellen et al. (1991), self-efficacy was identified as a major risk factor which explained technology innovation resistance. Self-efficacy in this instance refers to the confidence clients have in their ability to use technological services. The fear of making mistakes while conducting mobile banking activities, as well as feelings of insecurity, caused customers not to use mobile banking (Laukkanen et al., 2007a). Furthermore, customers who did not use mobile banking mentioned that at the bank branch they were less likely to experience problems (Aknci et al., 2004).

According to Black et al. (2001), customers worry about connection breaks while conducting banking activities. They also fear losing their money and they are concerned about the privacy of their personal information when it comes to mobile banking (Laukkanen et al., 2007a). Liao and Cheung (2002) found that confidentiality is a major concern which increases risk among customers. The risk barrier in this case can be defined as the perceived possibility of experiencing a loss when using cell phone banking.

Tradition barrier

When a technology innovation poses a change in customers' established traditions, then it can present a tradition barrier, particularly if it is contrary to the values that are important to the customer (Ram and Sheth, 1989). If the daily routines in particular are important to the customers then the tradition barrier will be even

stronger (Luakkanen et al., 2007a) because, for some customers, mobile banking is a channel they are not accustomed to (Fain and Roberts, 1997). Customers who prefer to deal with tellers have a higher tradition barrier (Marr and Prendergast, 1993) because the social dimension and human interaction are important to them (Gerrard et al., 2006; Srijumpa et al., 2007). Such customers do not want to deal with new approaches when carrying out their banking activities (Luakkanen et al., 2007a). Gerrard et al. (2006) also mentioned that some customers do not find it necessary to utilize mobile banking because they prefer their current way of handling their banking activities. The tradition barrier can therefore be defined as a resistance towards change in a customer's banking behaviour which is caused by cell phone banking.

Image barrier

An image barrier occurs when customers embrace stereotyped thinking concerning the relevant technological innovation and hence hinder its adoption (Ram and Sheth, 1989). Such thinking can be caused by the origin of the product in terms of its category, country of origin or the brand (Luakkanen et al., 2007a). Some customers who did not use mobile banking were those who had a negative 'hard-to-use' image of technology. Such customers perceive technology as being difficult to use and as a result they form a negative image of mobile banking (Luakkanen et al., 2007a). An image barrier is thus defined as the negative perception of cell phone banking as a result of the 'hard-to-use' image of the technology.

Information barrier

In this study, a barrier considered in addition to the barriers studied by Ram and Sheth (1989) was the information barrier. The information barrier was added because when customers do not have knowledge about cell phone banking, they may not know or understand the benefits nor will they know how they should use the service. Wilton and Pessemier (1981) demonstrated that when relevant information about technology innovation is limited to the bank customers then the customers will be inclined to resist adoption. Sathye (1999) mentioned that, it is important for banks to explain how such technologies add value compared to other means which offer the same benefit. A study by Laukkanen and Kiviniemi (2010) showed that knowledge about cell phone banking is the strongest factor that would decrease barriers to adoption. The information barrier is thus defined as a lack of knowledge about cell phone banking on the part of the bank concerned.

Having considered the arguments on technology

resistance, the following hypotheses were formulated:

H_4: Usage barrier negatively influences perceived ease of use.

H_5: Usage barrier positively influences the value barrier.

H_6: Value barrier negatively influences perceived usefulness.

H_7: Risk barrier negatively influences perceived usefulness.

H_8: Tradition barrier negatively influences perceived usefulness.

H_9: Image barrier negatively influences ease of use.

H_{10}: Information barrier negatively influences perceived ease of use.

H_{11}: Information barrier negatively influences perceived usefulness.

H_{12}: Information barrier positively influences the value barrier.

RESEARCH DESIGN AND METHODS

Sampling

The target population consisted of non-users of cell phone banking. This was appropriate since the intention of the study was to measure resistance to cell phone banking. Non-probability sampling was used and the sample size was 288 respondents.

Data collection

The data was collected by means of mall intercepts. Pilot testing was conducted with 200 respondents. Based on the results, certain questions were rephrased for the sake of clarity. The quality of the results of this study was therefore improved. Before the questionnaire was handed out, the respondents were asked whether they made use of cell phone banking. Only those who indicated that they were non-users of cell phone banking and had a bank account were allowed to complete the questionnaire.

The questionnaire had two sections: The first section measured the demographic information, and the second section measured the six barriers to technology acceptance, as well as perceived usefulness, perceived ease of use and behavioural intention as discussed under the theoretical framework. A seven-point Likert-type scale was used, where 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = undecided, 5 = slightly agree, 6 = agree and 7 = strongly agree. The scales used to measure resistance factors were adopted from Laukkanen and Kiviniemi (2010), Grabner-Krauter and Faullant (2008) and Laukkanen et al. (2008, 2007a, 2007b, 2009) (Refer to annexure A). The scales used to measure perceived usefulness, perceived ease of use and behavioural intention to use were adopted from Swilley (2010), Yoon (2010), Gu et al. (2009), Lee (2009), Grabner-Krauter and Faullant (2008), Zhao et al. (2008), Luarn and Lin (2005) and Wu and Wang (2005).

DATA ANALYSES AND RESULTS

Descriptive statistics

PASW 18 was used for descriptive data. The females comprised 50.3% of the sample while the males comprised

comprised 49.3% of the sample. The age groups were distributed as follows: 18 to 24 (25.7%), 25 to 29 (24%), 30 to 34 (19.4%), 35 to 39 (9.7%), 40 to 44 (9%) and 45 and above (10.8%). Those who were unemployed made up 22.9%, part-time employed were 19.4%, full-time employed 43.8% and self-employed were 12.8%. The results for level of education showed that 13.9% of the respondents did not have a high school education, 29.9% had a high school education, 17.7% had a college diploma, 11.5% had a technikon degree, 4.9% had a university degree and 16% had a postgraduate degree. The distribution of income was as follows: Less than R1 000 (29.2%), R1000 – R4 999 (28.1%), R5 000 – R9 999 (13.5%), R10 000 – R14 999 (15.3%), R15000 – R19 999 (7.6%) and R20 000 and above (6.3%). The demographic information is presented in Table 1.

Assessment of the measurement model

Before the assessment of the measurement model with EQS 6.1, the multivariate normality of the data was investigated. Data is considered to be multivariate normal if the standardized estimate of Mardia's coefficient is smaller than five (Byrne, 2006). In this study, the normalized estimate of Mardia's coefficient was 78.604, which suggests that the data violated the assumption of multivariate normality. Therefore, the measurement model was estimated using the maximum likelihood robust estimation method.

A confirmatory factor analysis (CFA) based on the measurement scales showed acceptable fit (Table 2). The values for the fit indices for the CFA were well below the recommended cut-off values for acceptable fit as indicated in Hair et al. (2006). The cut-off values are: $\chi^2/df < 3$, CFI > 0.9, RMSEA < 0.08.

The next step was to assess the construct reliability and validity of the measurement model. Construct reliability was assessed by dividing the squared sum of factor loadings with the sum of the squared factor loadings and the error variance terms for a construct (Hair et al., 2006). The cut-off value of >0.07 was used as an indication of acceptable construct reliability (Hair et al., 2006). The construct reliability value for every construct shown in Table 3 was well above 0.7. Convergent validity was examined by considering the average extracted variance of each construct in the model and the factor loadings. In the measurement model, the average extracted variances of all constructs were above 0.5, which suggests adequate convergence (Hair et al., 2006). Furthermore, in the measurement model the indicator variables loaded significantly onto the intended constructs and were above the recommended 0.7 (the ideal). Thus, the results in Table 3 provide considerable evidence of convergent validity.

Discriminant validity was examined by comparing the variance-extracted percentages for any construct with the squared inter-construct correlations associated with that

Table 1. Demographic analysis of the respondents.

Demographic variable		N	%
Age	18 – 24	74	26.1
	25 – 29	69	24.3
	30 – 34	56	19.7
	35 – 39	28	9.9
	40 – 44	26	9.2
	45+	31	10.9
	Missing value	0	0
	Total	288	100
Gender	Male	145	50.3
	Female	142	49.3
	Missing value	1	0.3
	Total	288	100
Employment	Unemployed	66	22.9
	Part-time employed	56	19.4
	Full-time employed	126	43.8
	Self-employed	37	12.8
	Missing value	3	1
	Total	288	100
Education	Below matric	40	13.9
	Matric	86	29.9
	College diploma	51	17.7
	Technikon diploma	33	11.5
	Technikon degree	14	4.9
	University degree	46	16
	Postgraduate degree	18	6.3
	Total	288	100
Income	Less than R1 000	84	29.2
	R1000 – R4 999	81	28.1
	R5 000- R9 999	39	13.5
	R10 000 – R14 999	44	15.3
	R15000 – R19 999	22	7.6
	R20 000 and above	18	6.3
	Total	288	100

Table 2. Goodness of fit summary for the measurement model.

Fit index	Value
Satorra-Bentler scaled χ^2	1127.638
df	706
S-Bχ^2/df	1.597
CFI	0.932
RMSEA	0.046

factor (Fornell and Larcker, 1981). If the variance-extracted estimate is greater than the squared correlation estimate it could be interpreted as evidence of discriminant validity. As shown in Table 4, the variance-extracted estimate for each construct was greater than the squared correlations associated with the construct. Thus, the criterion for discriminant validity in the measurement model was met.

Collectively, these results provide support for the overall quality of the measures used in the research to measure the constructs. In particular, these statistics suggest that the component measures are reliable and have convergent and discriminant validity.

Structural model assessment

EQS 6.1 was used to create the covariance-based structural equation model. Again, the maximum likelihood robust estimation method used as the normalised estimate of Mardia's coefficient for the structural model was 77.8966. The S-Bχ^2/df ratio of the structural model was 1.419; the CFI 0.955 and the RMSEA was 0.038. Considering the guidelines set by Hair et al. (2006) for model fit indices, it can be concluded that the hypothesized model fits acceptably with the observed data. The standardized path coefficients of the proposed research model are shown in Table 5.

The results of the assessment of the structural model indicated that, the hypothesized model explains approxi-mately 64% of the variance of the intention construct, whilst the determinants of perceived usefulness and perceived ease of use explain approximately 64 and 50% of the variance in the two constructs, respectively. In accordance with TAM theory, perceived usefulness and perceived ease of use have significant influences on intention, and perceived ease of use has a strong positive influence on the perceived usefulness of cell phone banking (0.498). The barrier with the strongest significant negative influence on perceived usefulness is the value barrier (-0.353), followed by the tradition barrier (-0.202). According to the results, the risk barrier and the information barrier do not exert a significantly negative influence on perceived usefulness. Of the three determinants of the perceived ease of use of mobile phone banking, the information barrier has the strongest significantly negative influence (-0.472), followed by the usage barrier (-0.304). The data did not support the hypothesis that the image barrier will influence perceived ease of use negatively (P>0.05). Lastly, in the theoretical discussion, it was also hypothesized that the usage barrier and the information barrier would have a negative influence on the value barrier. The results of the analysis supported these two hypotheses and show that the usage barrier has a stronger significantly positive influence on the value barrier than the information barrier (0.533 versus 0.253).

Table 3. Assessment of construct reliability and convergent validity.

Construct	Item	Standardized regression weight	Average variance extracted	Construct reliability
Usage barrier (UB)	UB1	0.819	0.698	0.927
	UB2	0.863		
	UB3	0.824		
Value barrier (VB)	VB1	0.745	0.678	0.938
	VB2	0.869		
	VB3	0.867		
	VB4	0.807		
Risk barrier (RB)	R1	0.718	0.654	0.953
	R2	0.756		
	R3	0.813		
	R4	0.838		
	R5	0.875		
	R6	0.842		
Tradition barrier (TB)	TB1	0.749	0.539	0.802
	TB2	0.719		
Image barrier (IB)	IB1	0.735	0.670	0.936
	IB2	0.852		
	IB3	0.848		
	IB4	0.833		
Information barrier (IFB)	IFB1	0.734	0.608	0.917
	IFB2	0.775		
	IFB3	0.796		
	IFB4	0.812		
Usefulness (U)	PU1	0.859	0.719	0.959
	PU2	0.9		
	PU3	0.823		
	PU4	0.864		
	PU5	0.789		
Ease of use (EOU)	EOU1	0.802	0.659	0.946
	EOU2	0.87		
	EOU3	0.769		
	EOU4	0.825		
	EOU5	0.79		
Intention to use (IU)	IU1	0.813	0.697	0.955
	IU2	0.871		
	IU3	0.853		
	IU4	0.824		
	IU5	0.813		

DISCUSSION

The results of the application of TAM supported the explanation of customers' resistance to cell phone banking. According to the results, the extended TAM can be used to explain the extent to which the various resistance factors influence the adoption of mobile phone banking. The result also demonstrates which barriers are

Table 4. Result of the assessment of discriminant validity according to Fornell and Larcker (1981).

	UB	VB	RB	TB	IB	IFB	PU	EOU	IU
UB	*0.698*								
VB	0.539	*0.678*							
RB	0.023	0.067	*0.654*						
TB	0.001	0.006	0.316	*0.539*					
IB	0.017	0.015	0.338	0.281	*0.670*				
IFB	0.233	0.311	0.017	0.008	0.001	*0.608*			
PU	0.271	0.421	0.017	0.027	0.022	0.334	*0.719*		
EOU	0.298	0.320	0.004	0.007	0.022	0.397	0.557	*0.659*	
IU	0.332	0.413	0.031	0.021	0.013	0.335	0.545	0.554	*0.697*

Note: Values in italics on the diagonal show the AVE; numbers below the diagonal represent squared
Inter-construct correlations.

Table 5. EQS 6.1 analysis results of the research model.

Determinant	Hypothesis	Standardized path coefficient	ρ	Variance explained of dependent variable
Intention to adopt cell phone banking (IU)	H_1: U → IU	.416	0.000	R^2 (IU) = .637
	H_2: EOU →IU	.430	0.000	
Perceived usefulness of cell phone banking (U)	H_6: VB → U	-.353	0.000	R^2 (U) = .644
	H_7: RB → U	.102	0.059	
	H_8: TB → U	-.202	0.006	
	H_{11}: IFB → U	-.120	0.092	
	H_3 EOU →U	.498	0.000	
Perceived ease of use of cell phone banking (EOU)	H_4: UB → EOU	-.304	0.000	R^2 (EOU) = .499
	H_9: IB → EOU	-.079	0.068	
	H_{10}: IFB → EOU	-.472	0.000	
Value barrier (VB)	H_5: UB → VB	.533	0.000	R^2 (VB) = .604
	H_{12}: IFB → VB	.253	0.001	

The value barrier has the strongest negative relationship on perceived usefulness, followed by the tradition barrier. The relationship of the risk barrier and the information barrier to perceived usefulness was not significant. This suggests that customers need to be better informed about the benefits of cell phone banking, so that, they can overcome the value barrier. Since the tradition barrier also has a significantly negative relationship with perceived usefulness, it means that the customers do not want to change their established traditions or daily routines, as is indicated in the theory. Gerrard et al. (2000) also indicated that, it may be possible that these clients prefer social interaction.

The information barrier had the strongest negative relationship with perceived ease of use. The usage barrier also had a strong positive relationship with perceived ease of use. These results showed that customers need more information about cell phone banking. It must be emphasized that it is simple to use such a service.

According to these results, one of the challenges is that clients perceive such a service been difficult or complex, as the theory also demonstrates.

The usage barrier and the information barrier were also strong positive determinants of the value barrier. In this instance, clients would need more information about the benefits, so that they can find cell phone banking valuable. As demonstrated in the theory of TAM, perceived ease of use had a strong positive influence on perceived usefulness. Both perceived usefulness and perceived ease of use have a positive influence on behavioural intention, with perceived ease of use being the strongest. Therefore, there must be a greater focus on these two determinants.

THEORETICAL AND MANAGERIAL IMPLICATIONS

According to the findings, the value barrier and the tradition

barrier strongly influence perceived usefulness negatively. The information barrier and the usage barrier influence perceived ease of use negatively. On the other hand, the value barrier is positively influenced by both the usage barrier and the information barrier. Finally, perceived usefulness and perceived ease of use positively influence behavioural intention.

The information acquired contributed to a better understanding of why clients resist cell phone banking. This was achieved by using TAM. Previous studies on cell phone banking have not done so. Furthermore, the findings of this study concur with those of Venkatesh and Bala (2008) who demonstrated that perceived usefulness and perceived ease of use can have other determinants. In this study, the determinants of these two constructs were resistance factors to technology as identified by Ram and Sheth (1989). The information barrier, which was not included in the work by Ram and Sheth (1989), was added. The impact of these resistance factors was explained in the context of mobile phone banking. A contribution is made with regard to the extent to which each resistance factor influences cell phone banking acceptance.

The information provided by the study is useful for managers who are responsible for marketing strategies. It is not sufficient for managers to know that the usage barrier, value barrier, risk barrier, tradition barrier, image barrier and information barrier play a role in influencing clients' resistance to cell phone banking. Managers must also know how and to what extent each resistance factor influences clients; this is the contribution of this study.

The two barriers that have a strong negative influence on clients' perception of ease of use are the information barrier and the usage barrier. For managers to improve clients' perceived ease of use, they need to ensure that in their marketing communication tools, they emphasize that less effort is needed when utilizing cell phone banking and that such a service is simple. Since the information barrier was the strongest barrier with a negative influence, the most important focus should be on giving information to clients about how easy it is to use cell phone banking. Promotions should also be run in the banks where clients are given an opportunity to try out the cell phone banking and the personnel should be readily available for assistance.

Concerning the perceived usefulness, the two barriers which have a strong negative influence are the value barrier and the tradition barrier. To improve perceived usefulness, managers need to promote the usefulness of cell phone banking from the perspective of the benefits it offers. It must be communicated through advertising that cell phone banking is useful and that the benefits far exceed the cost of learning to use the service. In other words, it must be demonstrated that cell phone banking is worth the cost. To reduce the tradition barrier, it would be useful to utilize sales advertising whereby customers are informed that cell phone banking is useful because it

does not threaten the traditional routines but enhances customers' way of life. Since both the usage barrier and the information barrier positively influence the value barrier, managers need to demonstrate value to their clients by emphasizing how cell phone banking can be part of the routine way of doing banking and that such a service is not problematic. Information explaining how cell phone banking adds value compared to other means of doing banking must be provided.

Given that perceived ease of use has the strongest influence on perceived usefulness compared to other determinants of perceived usefulness, the marketing focus should be on showing that cell phone banking is useful because it is easy to use. Behavioural intention is influenced by perceived ease of use more than perceived usefulness. Managers need to encourage clients to use cell phone banking because such a service is helpful and is free from effort. Neither the risk barrier nor the image barrier had a significant influence as determinants. This indicates that clients do not find cell phone banking risky nor do they have the perception that it is hard to use.

LIMITATIONS OF THE STUDY

One limitation of this study is that only resistance factors to technology acceptance were observed as determinants of perceived usefulness and perceived ease of use. Attitude, which plays a critical role in influencing behavioural intention, was not observed. For future studies, attitude should be included to give more insight into the clients' resistance to mobile phone banking. Furthermore, previous research demonstrated that clients differ in terms of variables such as age, income and gender. This study did not examine such moderating factors. Future studies must therefore focus on moderating factors so that managers are better enabled to tailor the cell phone banking. Another limitation was that, due to financial constraints, the sample size was small. For future research it is recommended that the sample size be larger.

Conclusion

The aim of the study reported in this article was to explain the resistance to the adoption of cell phone banking through the application of the application of the technology acceptance model (TAM). The results confirmed that the usage barrier and the information barrier are the determinants of perceived ease of use. It was also confirmed that the value barrier and the tradition barrier were the determinants of perceived usefulness. The risk barrier did not have a significant relationship to perceived usefulness and the image barrier did not have a significant relationship to perceived ease of use. These results would be useful to bank managers who have the

responsibility of encouraging their clients to use cell phone banking. These results can help managers make informed marketing decisions that will be useful in encouraging clients to utilize cell phone banking. It is therefore, important that managers of banks pay attention to the results and recommendations of this study.

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Annexure A

Usage barrier

UB1	In my opinion, cell phone banking services would not be easy to use*
UB2	In my opinion, cell phone banking services would not be fast to use*
UB3	In my opinion, the benefits of cell phone banking are not clear *

Value barrier

VB1	The use of cell phone banking services is reasonably priced*
VB2	In my opinion, cell phone banking is a convenient way of handling my financial matters*
VB3	In my opinion, the use of cell phone banking increases my ability to control my financial matters by myself*
VB4	In my opinion, cell phone banking would be useful to do my banking transactions*

Risk barrier

RB1	I believe that it can rather easily happen that my money could be stolen if I use cell phone banking
RB2	I would not feel totally safe providing personal information over cell phone banking
RB3	I am worried about using cell phone banking, because other people may be able to access my account
RB4	I would not feel secure sending personal information via cell phone banking
RB5	The cell phone banking system is not secure
RB6	Cell phone banking systems could be attacked or hacked into

Tradition barrier

TB1	I prefer to do my banking by means of established ways instead of using cell phone banking
TB2	I am so used to established ways of doing my banking, that I would find it difficult to change to cell phone banking

Image barrier

IB1	In my opinion, new technology is often too complicated to be useful
IB2	I have such an image that cell phone banking is difficult to use
IB3	Cell phone banking would make me feel frustrated
IB4	Cell phone banking would make me feel anxious

Information barrier

IFB1	In my opinion, there is enough information available about cell phone banking
IFB2	I feel that my bank has provided me with the necessary information I need to make a decision about using cell phone banking
IFB3	I feel that when needed, I will get enough guidance from my bank-related to cell phone banking
IFB4	I feel that information on cell phone banking is easy to obtain

Perceived usefulness

U1	Using cell phone banking would save me time
U2	Using cell phone banking would improve my efficiency in doing my banking transactions
U3	Cell phone banking would be useful to me
U4	I think that using cell phone banking would make it easier for me to carry out my banking tasks
U5	Overall, I think that using cell phone banking would be advantageous

Perceived ease of use

EOU1	Learning to use cell phone banking would be easy for me
EOU2	It would be easy to make cell phone banking do what I want it to
EOU3	I think that interaction with cell phone banking would not require a lot of mental effort
EOU4	I think that it would be easy to use cell phone banking to accomplish my banking tasks
EOU5	Using cell phone banking would be clear and understandable

Intention to use

IU1	I would use cell phone banking for my banking needs
IU2	I see myself using the cell phone banking for handling my banking transactions
IU3	I intend to use cell phone banking continuously in the future
IU4	I would recommend others to use cell phone banking
IU5	I will frequently use cell phone banking in the future

* Items were reverse coded.