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TO WHOM IT MAY CONCERN

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Post adoption phenomena for mobile service continuance: a mobile banking perspective

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Abstract:

The mobile phone as a tool for mobile banking services has great potential to revolutionize the financial services market. The benefits to users are the time and place independence which results in easy and convenient access to mobile banking services. Various studies have been completed to determine the factors that influence the adoption of mobile commerce services, like mobile banking. Adoption does not necessarily result in the ultimate success of mobile commerce services, as it merely helps influencing adoption rates. The paper was therefore aimed at proving further insights of factors that influence continued and repeat service usage of mobile banking services. This paper discusses mobile banking services and the importance of post adoption research. The proposed expectation-confirmation model (ECM) of IS continuance, that was used in this study, is explained in detail. At a practical level, the expanded expectation confirmation model used in this study presents IS service providers with insights in how to address their user's satisfaction and continued support of IS services.

Keywords: Mobile banking, Expectation Confirmation Model, Service Provider

Introduction

The mobile internet is growing rapidly, with mobile device penetration exceeding personal computer penetration globally (Constantiou, Mylonopoulos & Sideris, 2002; ITU, 2007). The potential of mobile commerce applications has seen many companies invest substantial resources on these forms of information technologies. Providing these services becomes

increasingly important for gaining a competitive advantage for companies (Lin & Wang, 2006). Many studies have been completed that identify factors which influence the adoption of new mobile information technologies and services (Anckar, Carlsson & Walden, 2003; Brown, Cajee, Davies & Stroebel, 2003; Brown & Molla, 2005; Chan, Kupta & Kim, 2007; Kim, Lee & Lee, 2007), such as cell phone banking adoption. Less attention is paid to determining which factors lead to continued use of mobile information technologies and services. The paradox in this is that an information technology success is not only a product of high adoption rates, but that the continued use of such an information technology results in ultimate success (Hong, Tam & Thong, 2006). It is important to understand what factors influence continued and repeat service usage versus discontinuance behaviour. Retaining customers and continued use is an imperative to ensure sustainability of m-commerce services (Lin & Wang, 2006). Hong et al. (2006) state "the potential benefits from increasing user retention rate can include a substantial reduction in operating costs and possibly a dramatic increase in profits". Other studies suggest that it costs between five to six times as much to recruit new users than to maintain existing ones (Bhattacherjee, 2001a; Spiller, Vlasic & Yetton, 2007).

Research questions and objectives

It is necessary to further investigate what factors will lead to continued and repeat use of mobile information technologies. Many studies focus on determining which factors influence technology adoption (Anckar et al., 2003; Brown et al., 2003; Brown & Molla, 2005; Chan et al., 2007; Kim et al., 2007), whereas comparatively few studies aim to determine which factors influence continued and repeat use (Bhattacherjee, 2001b; Hong et al., 2006). The purpose of this study was to determine factors that will result in continued and repeat use of mobile banking services in South Africa. In order to find new insights into mobile banking continuance we aimed to meet the following objectives:

- Provide insight into factors that result in mobile banking continuance and repeat use.
- Determine the relevant importance of these factors for mobile banking in South Africa.

Literature review

Overview of the mobile industry of South Africa

The slow growth in fixed line rollout and limited availability of fixed line infrastructure has led consumers in Africa to adopt mobile telephones services rather quickly. This has resulted in a mobile boom in Africa. Various factors have contributed to this mobile boom; these include cheaper infrastructure, larger regional penetration and business models oriented to the needs of poorer segments of the population (ITU, 2007b). This phenomenon is particularly relevant in South Africa. South Africa has a population of approximately 47.6 million people. Market information and statistics published by the International Telecommunication Union (ITU) indicate that mobile service penetration was at 83.3 percent in South Africa at the end of the year 2006. This is much higher than fixed line penetration, which was at 9.97 percent (ITU, 2007b). This shows that South Africans value mobile telephone services. Joubert (2006) states the mobile phone has progressed from a luxury to an essential tool in South Africa. Internet penetration in South Africa is rather low compared to the average worldwide penetration. The average penetration of internet users in G8 countries (Canada, France, Germany, Italy, Japan, Russia, the UK and the US) is at 50 percent. Internet penetration was at 10.75 percent in South Africa in 2006, according to the ITU study (ITU, 2007b). Users of mobile internet services have the potential of a much larger footprint than PC based internet users, especially in South Africa.

According to Anckar et al. (2003, p.887) "*mobility means freedom*". This new found freedom brings convenience through choice and value. Mobility may change the way companies and people work, communicate, buy and sell.

Online and mobile banking

Technology developments and the adoption of their opportunities are demonstrated in the success of online banking services through internet and mobile banking services (Laukkanen, 2007). Banking customers have become less willing to visit traditional branches. Customers have become more receptive to new electronic channels because of the convenience it brings in today's fast paced world and the fact that the cost of performing these transactions electronically is at lower rates compared to branch based transaction. These channels don't impose the normal constraint of business hour banking and allows users to make use of services 24 hours a day from anywhere (Laukkanen, 2007).

Mobile banking refers to the use of mobile devices to perform banking transactions. For the purpose of this study mobile banking is defined as the provisioning of banking service to the mobile phone. The service is data centric and provided over mobile telephone networks (Goode, 2007). The key concepts of this definition are the fact that mobile phones are used as the user end point, communication is data centric, and that the service is provided over a mobile telephone network. It is important to point out that this definition excludes voice based banking services, such as interactive voice response (IVR) telephone banking services. The diffusion of mobile phones worldwide and technological advancements in mobile phone capabilities has made the transformation of internet banking service to mobile devices the logical next development in electronic banking (Laukkanen, 2007). It is believed that mobile phones will increasingly be used for payments, banking, investing, and other transaction-based and security-sensitive applications (Herzberg, 2003). In mobile banking, the cell phone device is used as a terminal, similarly to an automatic teller machine (ATM). Mobile banking is considered to be one of the most promising m-commerce services (Chen & Frolick, 2004; Herzberg, 2003). The mobile phone as a tool for mobile banking services has great potential to revolutionize the financial services market (Goode, 2007). The benefits to users is the time and place independence which results in easy and convenient access to (mobile) banking services (Mallat, Rossi & Tuunainen, 2004). These potential benefits create an opportunity for banks and financial institutions that continually look at ways to improve service, reduce costs, improve efficiencies, increase market coverage and to differentiate services and products (Brown & Molla, 2005; Kim et al., 2007). Through mobile banking (m-banking) services financial institutions and banks aim to provide a convenient alternative to the traditional banking services (Kim et al., 2007).

Although efforts are focused on developing better and more convenient banking services, m-banking adoption is slow and underutilized (Kim et al., 2007, Laukkanen, 2007). A study completed in South Africa during 2006 found that (of the respondents) only 10 percent of bank account holders have ever used their cell phones for m-banking (World Wide Worx, 2006). Despite the success of cell phone use compared to internet use, the success of m-banking has not paralleled the success of internet banking in South Africa. Advances in mobile phone technology, like web access functionality, is likely to result in the diffusion of this situation (Brown & Molla, 2005). Banks in South Africa however remain positive and continue to believe that m-banking will deliver on its promise. Demand in rural areas of South Africa is often higher than in urban areas. This supports findings from the "Mobility 2005" (Goldstuck, 2005) report, which states that the need for access was more important, than being switched on to the possibilities of information technology. M-banking is the logical solution for South Africa as there is high rural population coverage by mobile services and where there is limited access to

banking services to the so called unbanked part of the population (Ashford, 2004). Further mobile banking can be used as an extension or complementary service to internet banking services (Basso et al, 2007; Brown et al., 2003). The mobile banking technologies have matured and are available worldwide (Basso et al., 2007). Mobile phone technologies have also advanced with a growing number providing internet access to perform online transactions (Laukkanen, 2007).

Research conducted by Juniper Research forecasts, that by the end of the year 2011, 20 percent of world's mobile phone users would have adopted mobile banking services. This means that all regions will see a significant growth in the adoption of these services over the next four years (Goode, 2007). This forecasted growth equates to an approximate 600 percent increase of mobile banking users worldwide between the years 2008 to 2011. The total number of mobile banking users worldwide is estimated to grow to 816.4 million users by the end of the year 2011 (Goode, 2007).

Mobile banking user perceptions and perceived inhibitors of mobile banking

The research study by World Wide Worx (Goldstuck, 2005) also determined the perceptions of users of mobile banking. The results show that more than 60 percent of the respondents perceived mobile banking as convenient and more than 50 percent perceived the service to be versatile and easy to use. 48.7 percent perceived the service as safe and 47 percent indicated that they are comfortable using the service. Previous studies have highlighted a number of inhibiting factors of mobile banking services. These include the perception that mobile banking service costs are high, that the services are complex to use and that potential security issues may exist (Laukkanen, 2007). These three issues can be addressed; in fact most mobile banking services are free in South Africa, but users must be educated about the low data cost charged by the mobile network operators.

Determinants of continuance intention

Factors leading to adoption of information technologies receive much attention. Various studies have been completed to determine the factors that influence the adoption of mobile commerce services (Anckar et al., 2003; Brown et al., 2003; Brown & Molla, 2005; Chan et al., 2007; Kim et al., 2007), such as mobile banking. Meeting the necessary adoption factors for an information technology does not necessarily result in the ultimate success of the technology, but merely helps to influence the adoption rate of the technology or service (Hong et al., 2006).

The initial acceptance and adoption of an information technology is an important step toward realizing success, but continued use results in the ultimate success of such an information technology (Bhattacherjee, 2001b). It is important to understand which factors influence continued and repeat service usage versus discontinuance behaviour (Lin & Wang, 2006). Studies such as the innovation decision theory acknowledges that users re-evaluate their initial adoption decision during the final stage of acceptance commonly referred to as the confirmation stage (Bhattacherjee, 2001b).

Retaining customers and ensuring continued use is an imperative to ensure sustainability of m-commerce services (Lin & Wang, 2006). For service providers (companies) to survive, they require both initial adoption as well as continued use. Retaining customers is between five and six time cheaper than acquiring new ones (Bhattacherjee, 2001a; Spiller et al., 2007). To highlight the importance of retention the following example by Crego and Shiffrin (1995, cited by

Bhattacherjee, 2001b, p352) puts this statement in perspective. They suggest that "*a 5% increase in customer retention in the insurance industry typically translates into 18% saving in operating costs"*.

Analytical frameworks developed to determine adoption behaviour are often extended to determine post adoption behaviour. The assumption that adoption factors can be extended to determine post adoption behaviour is limited to the factors considered for initial adoption and not necessarily includes factors which influence continuance of use (Bhattacherjee, 2001b; Spiller, Vlasic & Yetton, 2007). Often factors not considered for initial adoption may impact continued and repeat use. Therefore alternative frameworks can be used to determine the factors that influence continuance, as the antecedents of continuance vary from the initial adoption decision making process. (Spiller et al., 2007).

Expectation confirmation for is continuance (model)

Research into post purchase behaviour is a dominant theme in consumer behaviour literature. The expectation confirmation theory (ECT) framework is commonly used in a post purchase context to determine satisfaction and re-purchase decisions of consumers (Bhattacherjee, 2001b; Hong et al., 2006).

In the information technology context, reuse and continuance of the service are the equivalent of a repurchase. The theoretical constructs pertinent to repurchase intention are influenced by four constructs as shown in

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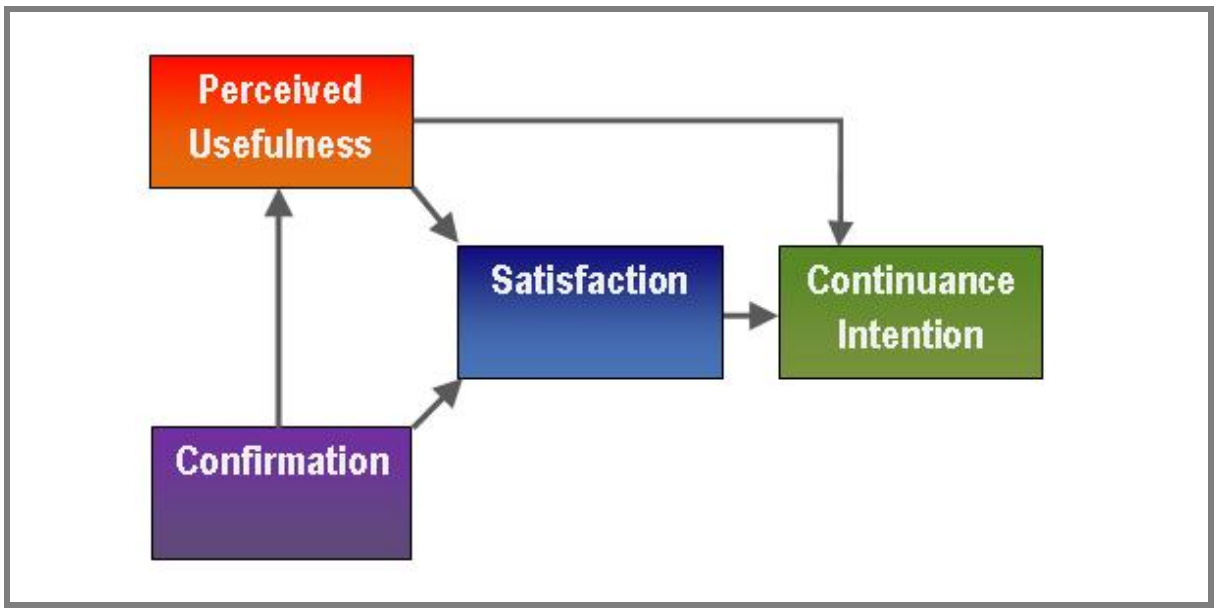
Firstly the customer forms an initial expectation of the product or service before purchasing it. After purchasing the product or service, the customer starts using it and begins forming a perception of it. The customer assesses the performance of the product or service in reference to his or her initial expectation. This determines to what extent the customer's expectations are confirmed or exceeded. Finally the level of confirmation translates into a level of customer satisfaction with the product or service which results in a repurchase (Atchaiyachanvanich, Okada, Sonehara, 2006; Bhattacherjee, 2001b). The repurchase intention (or reuse) is therefore primarily determined by the level of customer satisfaction with the product or service, which in turn is influenced by confirmation. Satisfied customers will repurchase or reuse and dissatisfied customers will discontinue subsequent purchases or use (Atchaiyachanvanich et al., 2006; Bhattacherjee, 2001b).

The repurchase intention (or reuse) is therefore primarily determined by the level of customer satisfaction with the product or service, which in turn is influenced by confirmation. Satisfied customers will repurchase or reuse and dissatisfied customers will discontinue subsequent purchases or use (Atchaiyachanvanich et al., 2006; Bhattacherjee, 2001b). Bhattacherjee (2001b) developed the Expectation Confirmation for IS Continuance model. His work is based on a sound theoretical foundation "that focuses on an individual's psychological motives during post-adoption, and it has been successfully adapted to the IS context" (Cheung et al., 2007, p708).

Figure 1: Expectation-confirmation model of IS continuance (Adapted from "Bhattacherjee, 2001b)



IS (Information Services) users continuance or re-use decision making process is similar to that of the repurchase decision. Both follow an initial acceptance or adoption, and are influenced by the initial use which may lead to the reversal of the initial decision and result in discontinuance of the use of the IS solution (Cheung et al., 2007; Bhattacherjee, 2001b). When using the ECT for IS continuance, it is necessary to add theoretical extensions to refine the theory. Bhattacherjee (2001b, p355) states that theory refinement "*can explain IS continuance better than ECT alone*". Three changes to the ETC were proposed by him (see **Figure 1**).

1. The proposed ECT model focuses only on post-acceptance variables and not pre-acceptance variables. This is because pre-acceptance variables are already included in the confirmation and satisfaction constructs (Bhattacherjee, 2001b).

2. The ECT only evaluates the pre-consumption expectation. In the IS context, post-consumption expectation is important, as the users expectation may change over time. For this reason ECT is extended to include post-consumption expectation (Bhattacherjee, 2001b).

3. Expectation is replaced with perceived usefulness in the proposed model. Bhattacherjee (2001b) argues that this extension is relevant, as it is the only belief that has been demonstrated to consistently influence user intention through both adoption and post adoption stages of IS use.

The proposed expectation-confirmation model by Bhattacherjee hypothesizes that a customers' level of satisfaction with the IS solution determines his or her continuance intention. In turn the customers satisfaction is determined by the level of the users' confirmation of the IS solution expectations and the perceived performance (usefulness) of the IS solution (Hong et al., 2006). The relationship between the proposed constructs is discussed in subsequent sections.

Explaining is continuance intention

The proposed model by Bhattacherjee (2001b) is adapted from the ECT, but with some unique

features. The updated model highlights the importance of post-adoption expectations rather than pre-adoption expectations. As users gain experience in using the solution the user's expectation can change from the initial pre-adoption expectation. Expectations based on user experience with the IS solution are the main predictor of satisfaction (Hong et al., 2006). Secondly the updated model replaces expectation with perceived usefulness. According to Hong et al. (2006, p801) perceived usefulness is the "*most consistent antecedent of the user's intention to use*" an IS solution. Perceived usefulness is an adequate expectation in the IS continuance context and reflects the current thinking in the area of IS (Cheung et al., 2007). Thirdly the updated model does not include performance as it presumes that performance is already accounted for by the confirmation construct. This means that "*the influence of performance is mediated by confirmation*" (Hong et al., 2006).

The results of Bhattacherjee's (2001b) study proved that satisfaction with IS use is the strongest predictor of the users' continuance intention. Perceived usefulness was confirmed to be a significant, but weaker predictor than satisfaction. The effect of perceived usefulness is an important construct in both the acceptance and continuance contexts, but it appears that the size of the perceived usefulness effect diminishes over time. This phenomenon can be explained by the fact that the post acceptance satisfaction is grounded in the users experience with the IS solution rather than his or her cognitive beliefs (perceived usefulness) formed from initial second hand information that maybe has bias (Bhattacherjee, 2001b). Bhattacherjee (2001b) believes that ignoring pre-acceptance user perception may not severely influence adoption, but ignoring post-acceptance satisfaction may have a disastrous impact on continuance.

Construct relationships of the ECT for IS continuance

Relationship of continuance intention to satisfaction: Satisfaction with an IS solution reinforces the users intention to continue using the IS solution (Cheung et al., 2007). Satisfaction is therefore positively related to the users continuance intention of the IS solution (Bhattacherjee, 2001b; Hong et al., 2006). The result of Bhattacherjee's (2001b) study identified satisfaction to be the greatest predictor of continued IS use.

Relationship of satisfaction to confirmation: Satisfaction is determined by two constructs. Firstly by the confirmation of the user's expectation based on use experience of the IS solution. Realization of the expectation results in confirmation being positively related to the user's satisfaction of the IS solution (Bhattacherjee, 2001b; Hong et al., 2006).

Relationship of satisfaction to perceived usefulness: The second construct that determines satisfaction is perceived usefulness. Perceived usefulness determines to what extent the user intends to use an IS solution. Perceived usefulness is therefore positively related to the user's satisfaction of the IS solution (Bhattacherjee, 2001b, Hong et al., 2006).

Relationship of continuance intention to perceived usefulness: Perceived usefulness influences both the initial adoption and the user continuance intention. Perceived usefulness is determined by the users' experience of how efficient the solution is. Perceived usefulness is therefore positively related to the users continuance intention of the IS solution (Bhattacherjee, 2001b; Hong et al., 2006). The result of Bhattacherjee's (2001b) study identified perceived usefulness to be the second strongest predictor of continued IS use.

Relationship of confirmation to perceived usefulness: Perceived usefulness and

confirmation are related in an IS continuance context. Perceived usefulness provides the baseline against which confirmation of an IS solution (product or service) is confirmed. Confirmation is therefore positively related to perceived usefulness of the IS solution (Bhattacherjee, 2001b; Hong et al., 2006).

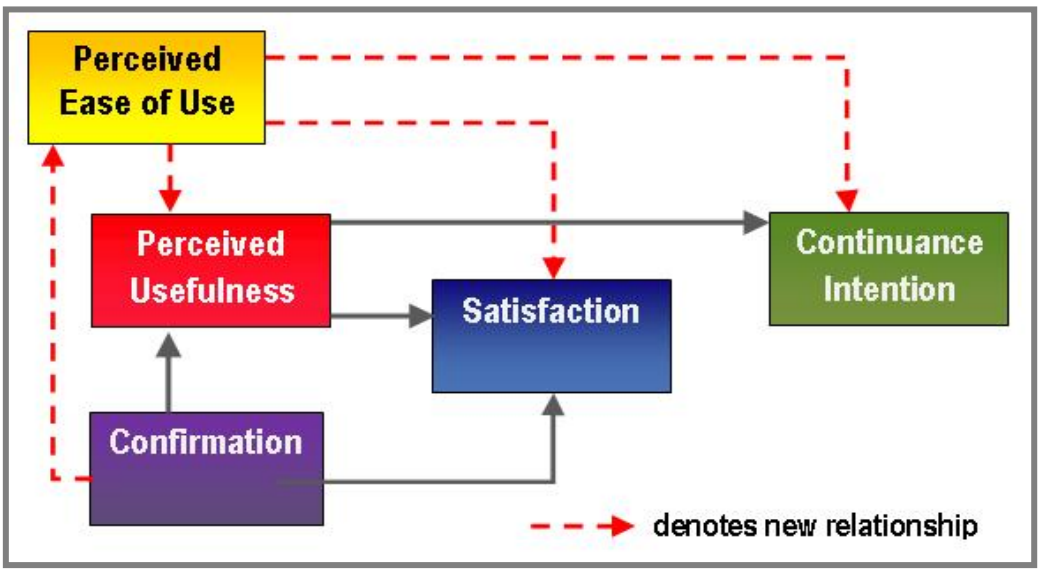
Possible extension to the ect for is continuance model

Various studies have expanded on the initial model of ECT for IS Continuance. Extensions include adding constructs like trust, habit and prior use. A study by Hong et al. (2006) into mobile internet service continuance validated the perceived ease of use construct by using an expanded model of Bhattacherjee's ECT IS continuance model. For the purpose of researching mobile banking continuance it is suggested that perceived ease of use is considered as an additional construct to extend the ECT of IS continuance model.

Perceived ease of use is commonly used to explain IS solution adoption in many studies using the technology acceptance model (TAM). IS solution usage is associated with perceived ease of use (Hong et al., 2006). The study indentified that perceived ease of use has a relationship to the perceived usefulness, satisfaction and continuance intention constructs. Similar to the reasoning that there is a relationship between confirmation and perceived usefulness the study identified that confirmation has a relationship to perceived ease of use. The additional relationships to the proposed (extended) ECT for IS continuance is reflected in

Figure 2.

Figure 2: Extended expectation-confirmation model of IS continuance



Research methodology

The philosophy that drives this research was positivism to test and prove or disprove the hypotheses listed in

Table 1. The positivism approach is justified as the research attempts to find quantifiable data to validate the proposed Expectation Confirmation model for IS continuance. An explanatory research approach was followed to establish the fundamental relationship between the different variables and provide further insight to the factors that influence continued and repeat use of mobile banking services.

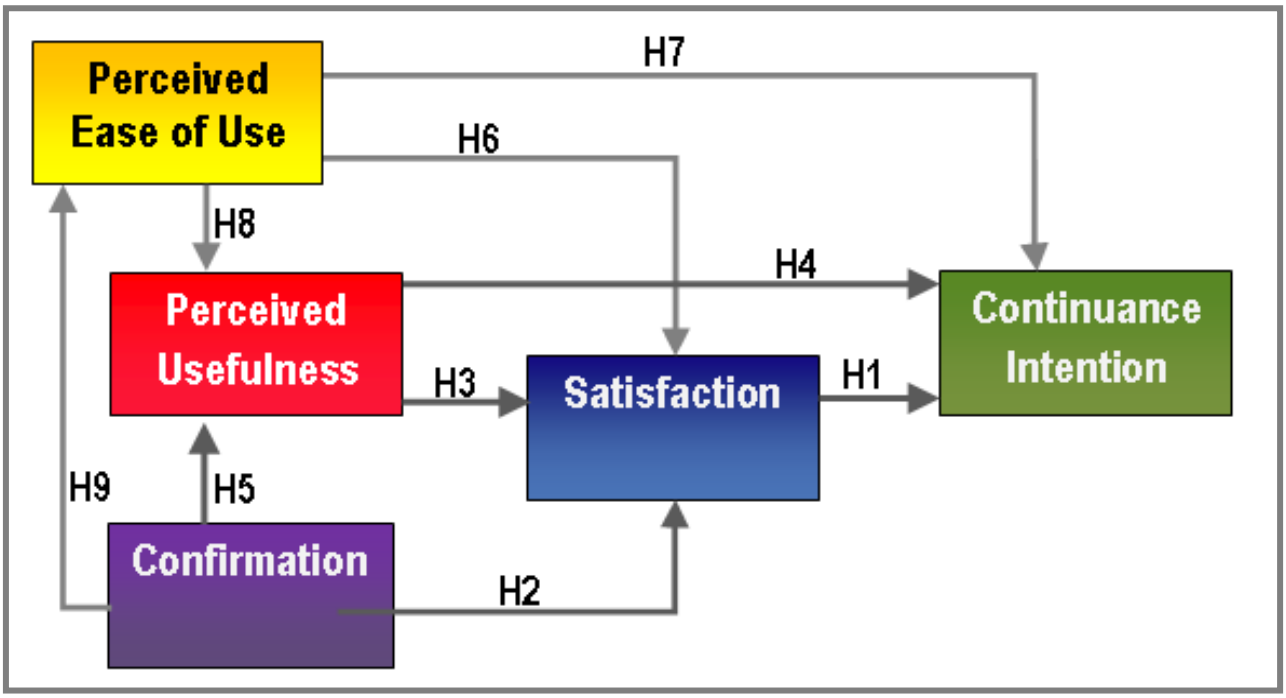
Table 1: Proposed hypotheses

NO.	HYPOTHESES
H1	User's satisfaction with mobile banking is positively related to their continued mobile banking usage intention.
H2	User's confirmation of expectations is positively related to their satisfaction with mobile banking.
H3	User's perceived usefulness of mobile banking is positively related to their satisfaction with mobile banking.
H4	User's perceived usefulness of mobile banking is positively related to their continued mobile banking usage intention.
H5	User's confirmation of expectations is positively related to their perceived usefulness of mobile banking.
H6	User's perceived ease of use of mobile banking is positively related to their satisfaction with mobile banking.
H7	User's perceived ease of use of mobile banking is positively related to their continued mobile banking usage intention.
H8	User's perceived ease of use of mobile banking is positively related to their perceived usefulness of mobile banking.
H9	User's confirmation of expectations is positively related to their perceived ease of use of mobile banking.

A deductive approach was applied to test and confirm the hypotheses statements and to test the Expectation Confirmation theory for IS continuance. The quantitative data was gathered by means of a survey questionnaire. A cross-sectional timeframe was chosen, as the factors that determine continued and repeat use of mobile banking services were measured at a specific point in time over a three week period. To test the theory and validate the hypotheses, a survey questionnaire was used. The questions used to test the model described in the literature review, were based on previous studies (Hong et al., 2006; Lin & Wang, 2006) conducted to determine continuance behaviour in a mobile commerce context and was aimed at collecting information regarding the perception of mobile banking services. A five point Likert scale was used to measure responses in this section, with the scale ranging from *strongly agree* to *strongly disagree*. The variables used in these hypotheses are based on the proposed model (extended expectation confirmation model of IS continuance) for this study as reflected in

Figure 3.

Figure 3: Proposed research model (extended ECT model of IS continuance)



The study was limited to users that use or have used mobile banking services. The target population included users of all ages across the main centres in South Africa. The aim of the researcher was to receive one hundred responses to ensure a large enough sample size that is of statistical significance. Preliminary investigation by the researcher suggested that it was difficult to find individual cases of users with previous mobile banking experience. For this reason a non-probability convenience sampling approach was used. Further to this, the researcher also used the snowball sampling to identify potential respondents once the initial contact was made with respondents. In total seventy two (72) responses to the survey questionnaire were received. Although the number of responses were less than the targeted number of one hundred (100) responses, the number of responses was adequate to successfully complete the research. The "Statistica" software tool was used to perform data analysis. The aim of data analysis was to identify relationships between variables and to determine the significance of each relationship.

Data analysis

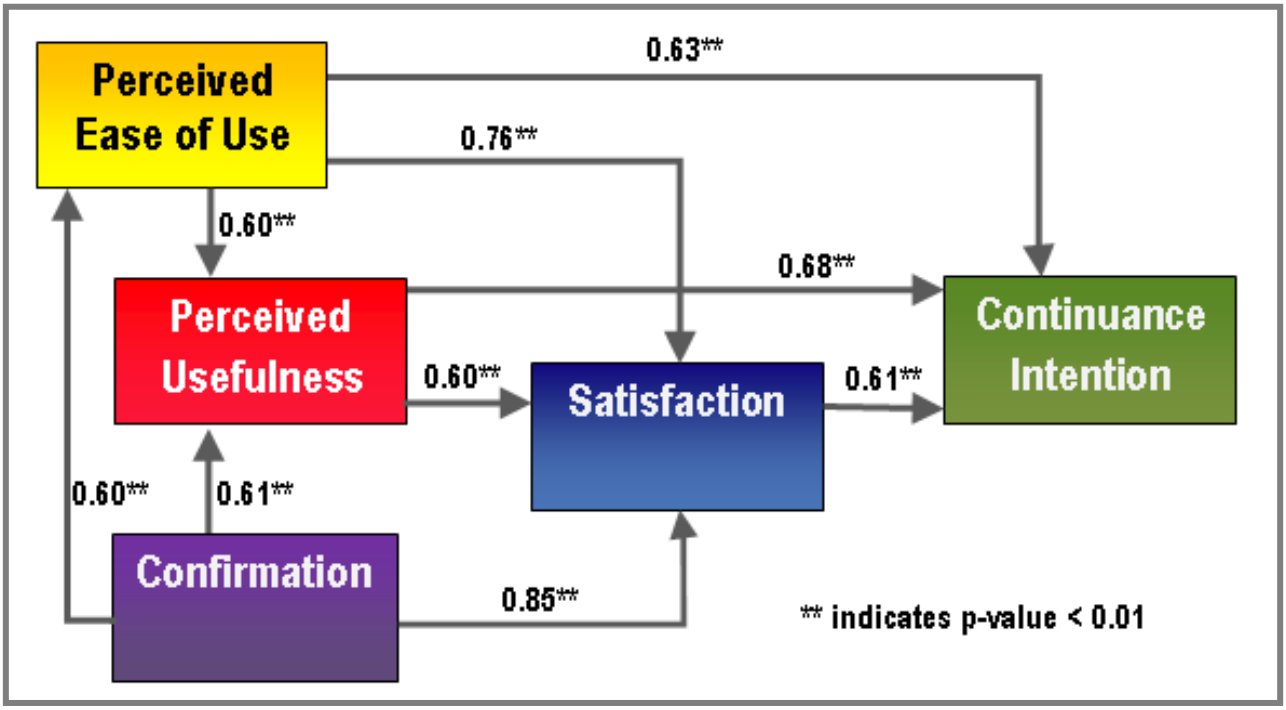
The information discussed in this section presents the data analysis and findings collected from the research instrument data. In total, seventy two responses were received. Four responses were rejected based on the fact that people who have not used mobile banking previously responded to the survey questionnaire. Previous use was a prerequisite for participation in this study. The hypotheses were tested using Pearson correlation and regression analysis to test the relationships between constructs. Spearman correlations were also calculated as a robust non parametric test. The results are shown in the following Table 2.

Table 2: Results of the Hypotheses testing

NO.	HYPOTHESES	Pearson Correlation Coefficient	Explained Variance
H1	User's satisfaction with mobile banking is positively related to their continued mobile banking usage intention.	0.61	37%
H2	User's confirmation of expectations is positively related to their satisfaction with mobile banking.	0.85	72%
H3	User's perceived usefulness of mobile banking is positively related to their satisfaction with mobile banking.	0.61	37%
H4	User's perceived usefulness of mobile banking is positively related to their continued mobile banking usage intention.	0.68	47%
H5	User's confirmation of expectations is positively related to their perceived usefulness of mobile banking.	0.62	38%
H6	User's perceived ease of use of mobile banking is positively related to their satisfaction with mobile banking.	0.77	59%
H7	User's perceived ease of use of mobile banking is positively related to their continued mobile banking usage intention.	0.63	40%
H8	User's perceived ease of use of mobile banking is positively related to their perceived usefulness of mobile banking.	0.60	37%
H9	User's confirmation of expectations is positively related to their perceived ease of use of mobile banking.	0.60	36%

Figure 15 provides a summary of the data analysis findings and reflects all hypothesised paths. The discussion in this section is based on the summary data reflected in this figure.

Figure 4: EC model for IS continuance data analysis summary



Both "Satisfaction" and the perceptions of the post adoption beliefs, such as "Perceived Ease of Use" and "Perceived Usefulness" were identified as significant determinants of IS "Continuance Intention". The data identified "Perceived Usefulness" to be the strongest predictor of "Continuance Intention". This finding differs from previous research (Bhattacherjee, 2001b; Hong et al., 2006) that identified "Satisfaction" as the strongest predictor of the user's "Continuance Intention". This result is not is not unexpected as Lin, Tsai & Wu (2005) explains a service must provide the necessary capabilities and functionality to retain customers. Nevertheless, this study provides further support that the inclusion of the "Satisfaction" construct in determining "Continuance Intention" is strongly warranted. Hong et al. (2006, p806) support this finding by stating "*having satisfied users is the critical driver of continued IT usage intention*". These findings suggest that for mobile banking continuance the user's perception, of how useful the service is, is the most important driver. This finding may be as a result of the technology in question, as this study found support for the statement that mobile banking can be seen as a complementary service to internet banking. Usefulness would therefore be an important consideration for continuance intention. However both the user's "Perceived Ease of Use" of the service and their "Satisfaction" with the service remain strong predictors of the user's intention to continue using mobile banking services.

The results of this research further support the proposition that a user's level of "Confirmation" of his or her post adoption beliefs (Perceived Ease of Use and Perceived Usefulness) translate into a level of "Satisfaction" with the service. The data identified "Confirmation" to be the strongest predictor of "Satisfaction". This finding supports previous research (Bhattacherjee, 2001b; Hong et al., 2006; Lin et al., 2005) that also identified "Confirmation" as the strongest predictor of the user's level of "Satisfaction". "Perceived Ease of Use" and "Perceived Usefulness" were also confirmed to be significant, but weaker predictors of "Satisfaction".

This study supports the finding by Hong et al. (2006) and Lin et al. (2005) that user's place more emphasis on the confirmation of their expectations than on individual post adoption beliefs to

determine their level of satisfaction with the service. This supports the argument that the level of confirmation of expectation is affected by the extent to which the user's post adoption beliefs are met. This implies that users will change their post adoption beliefs based on the extent to which the user's expectation of the service is confirmed.

In this study the two post adoption beliefs of "Perceived Ease of Use" and "Perceived Usefulness" were both confirmed to be strong predictors of the "Continuance Intention". This confirms the prediction of the ECM that post adoption beliefs influences continued IS usage (Hong et al., 2006). Between these two post adoption beliefs the impact of the "Perceived Usefulness" was stronger than that of "Perceived Ease of Use" on the user's "Continuance Intention". This finding provides support for the statement that perceived usefulness may have a significant influence on task based services (Lin et al, 2005).

The strong impact of "Perceived Ease of Use" on continued IS use may be a result of the technology of mobile banking services that were being researched. According to Hong et al. (2006, p807), if the technology of interest "*inherently requires its users to undergo a long and continuous learning process, then perceived ease of use may not remain as a secondary factor after perceived usefulness*". A further contribution of our research is that it supports the Hong et al. (2006) study to extend the Expectation Confirmation model for IS Continuance with the post adoption belief "Perceived Ease of Use".

It needs to be noted that the sampling method used in this study was a non-probability sampling with the use of the snowballing technique. This approach is considered not to be generalisable. However, the research provided support for previous studies which used probability sampling. It is also important to consider, that during the factor analysis process the "Satisfaction" variable data did not load onto a single factor. Questions for this construct showed a closer correlation to the questions from the post adoption beliefs ("Perceived Ease of Use" and "Perceived Usefulness"). The result of this phenomenon may have skewed the impact of these post adoption beliefs to the extended Expectation Confirmation model for IS Continuance.

Conclusions

Despite the need for mobile banking service continuance, the factors that influence reuse and continuance for these services have rarely been explored. It is important to ensure that user requirements are met and to measure the user's mobile banking perceptions. This information will help to identify suitable improvement opportunities for IS solutions for partitioners to enhance ease of use and the usefulness of these services and to increase the users' satisfaction with these services. This study was based on the Expectation Confirmation model for IS Continuance originally developed by Bhattacherjee (2001b). For the purpose of researching mobile banking continuance the model was extended to include the post adoption belief of "Perceived Ease of Use". This extension was considered to be an adequate expectation in the IS continuance context and reflects the current thinking in the area of IS. This study provides support for the "Perceived Ease of Use" extension to the Expectation Confirmation model for IS Continuance.

The results of researching the model is strongly supportive of the extended Expectation Confirmation Model (ECM) for IS Continuance, with all hypotheses links being significant. The user's confirmation of their post adoption beliefs was the most important factor in determining the user's level of satisfaction with the mobile banking service. This means, that the user's assessment of how easy they perceive it is to use the service and how useful they perceive the

service, results in the level of confirmation of these perceptions and ultimately translates into a level of satisfaction with mobile banking. When considering factors that influence continued and repeat use of mobile services it was determined that the user's perception of how useful the service is, is the most important predictor of IS continuance of mobile banking services. Additionally both the user's perception of how easy it is to use the service and the user's satisfaction with the service were confirmed to be strong predictors of continued and repeat use of mobile banking services. The influence of the "Satisfaction" variable to the "Continuance Intention" variable was identified to be a secondary predictor to" Perceived Usefulness". Although this finding was somewhat unexpected, further research could validate this finding and provide further insight as to why this was the case. This maybe as a result of the technology (mobile banking services) used to determine the post adoption phenomenon. In previous studies "Satisfaction" was the strongest predictor of "Continuance Intention". According to Hong et al. (2006, p807), if the technology or service of interest requires users to continually undergo a learning process, the influence of "Perceived Ease of Use" may change over time. The strong affect of the "Perceived Ease of Use" variable to "Continuance Intention" justifies further and more detailed research. It is suggested, that the impact of this variable ("Perceived Ease of Use") and also the "Perceived Usefulness" variable could be measured over time (longitude study) to determine if the influence of these post adoption beliefs may change as users continue to use the technology or service.

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