Explaining sustained post-adoption use of mobile banking

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ABSTRACT

The high growth and adoption of 3G smart mobile devices have provided lucrative opportunities for firms. Firms can provide wireless online services and access more market segments. This is primarily attributed to the high penetration rate of mobile devices. Although the consumption of online mobile services has been favourable, the consumption of mobile banking services has proven to be less popular. This study presents a model derived from the literature to provide a deeper understanding of consumer usage characteristics and the factors that promote sustained use of mobile services. The study focuses on the post adoption phase of the mobile banking lifecycle. The proposed model was empirically tested using structured equation modelling with path analysis on a final sample of 196 respondents. Data was collected using online surveys. Findings were that both perceived value and trust are important antecedents of sustained mobile banking use. The information and e-service quality aspects of the mobile system are also identified to be important contributors to the perceived value and also to indirectly influence sustained use. Only e-service quality was identified to be a valid contributor to trust. Moderation analysis was also performed to determine the effect of technology anxiety on the sustained use. However no relationships were identified. The study concludes with research and practical implications. Opportunities for further research are also stipulated.

Keywords: Mobile banking, information quality, e-service quality, trust, technology anxiety and sustained use

DECLARATION

I, Bhavesh Khoosal Desaraj, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Bhavesh Khoosal Desaraj

Signed at ……

On the …….. day of …… 2013

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The experience of conducting and completing this research report has been both a challenging and rewarding one. I have learnt may lessons along the way and have become an expert in the subject matter. I would have not have accomplished this journey without the help of my loving fiancé, family, friends and my supervisor. I would therefore like to extend my gratuity and appreciation to the following people:

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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to provide a deeper understanding of consumer usage characteristics and the factors that promote sustained use of mobile services.

1.2 Context of the study

The recent high growth and adoption of 3G smart mobile phones have provided lucrative opportunities for firms (Yu, 2012). Companies such as Apple have experienced high growth through their innovative online offerings and smart phones. Apple's online store (iTunes) has revolutionised the music industry and has resulted in a fundamental shift in the way that it conduct business. iTunes offers over 28 million songs and has realised revenues of approximately $ 1.4 billion during the first quarter of 2011 (Dilger, 2011).

Although the consumption of online mobile services and applications has been favourable, the use of mobile banking services has been somewhat less popular in comparison (Cruz, Neto, Munoz-Gallego and Laukkanen, 2010; Yu, 2012). Mobile banking is identified to be to be underutilised and a relatively small contributor to the overall transaction portfolio of banking institutions (Laukkanen, 2007; Yang, 2009; Huili and Zhong, 2011; Yu, 2012). Although internet and mobile banking are similar concepts, they are vastly different channels. Internet banking refers to the access of banking services through the use of computers that are connected to the internet whereas mobile banking refers to the consumption of banking services through wireless devices such as mobile phones, tablets and smartphones (Riquelme and Rios, 2010; Sripalawat, Thongmak and Ngramyarn, 2011). Further, mobile banking, due to the relatively high penetration rate of mobile devices, offers access to different market segments (Cruz et al., 2010; Dasgupta, Paul and Fuloria, 2011; Kang, Lee and Lee, 2012). For instance many rural areas in emerging countries will have

access to mobile wireless services as opposed to broadband internet services (Dasgupta et al., 2011). It is therefore suggested that mobile banking is a different channel to internet banking and requires its own focus of study.

A review of the literature identified a relatively small number of mobile banking studies compared to the number of fixed internet banking studies (Suoranta and Mattila, 2004; Laukkanen and Pasanen, 2008; Püschel, Mazzon and Hernandez, 2010; Yu, 2012). Further, the identified mobile studies were largely focused around the antecedents of mobile adoption as opposed to actual usage factors (Wu and Wang, 2005; Kang et al., 2012; Yu, 2012). Insight into usage factors that can promote the sustained usage of mobile services would be highly beneficial to both academics and practitioners (Kang et al., 2012). This study therefore aims to extend the literature in order provide more insight into this phenomenon.

1.3 Problem statement

The problem statement of this research is: "Explaining the post adoption use of mobile banking".

1.4 Significance of the study

This study addresses a gap in the current body of knowledge. There are currently a limited number of studies that focus on the post-adoption phase of mobile banking services (Wu and Wang, 2005; Kang et al., 2012; Yu, 2012).

The study will provide deeper insight into consumer usage behaviour of mobile services by using a model derived from theory. This study will thus be useful for academics, practitioners, banking institutions and other organisations. Academics can build upon the current body of knowledge by analysing the proposed model and findings. This would provide much needed insight into consumer usage behaviour of mobile banking services and sustained use thereof. Practitioners involved in the implementation of mobile banking systems can also benefit from the findings of this study. Findings may indentify critical factors that aid in the successful implementation of mobile banking systems.

Results of this study may provide guidance to banks on how to promote sustained mobile banking service usage. The current high mobile penetration provides huge growth potential and access to alternative market segments for them. Findings of this study can identify factors that banks can be manipulated in order to retain and grow customer base. This would help recoup much of their existing mobile investment costs, as the sustained use of mobile banking services would provide a steady stream of long term profits and the opportunity to cross-sell (Wu and Wang, 2005; Goswami and Raghavendran, 2009). Further, mobile banking can be used for routine tasks. This can release resources such as call centre agents and tellers (Goswami and Raghavendran, 2009). Finally, findings of this study could possibly be applied to other mobile services. This would provide adequate growth opportunities for other firms.

1.5 Delimitations of the study

- The conceptual model proposed has been derived from the authors' review of IS literature.
- The study will only focus on the post-adoption phase of mobile banking services
- Respondent data is to be collected at one point in time; a longitudinal approach will not be followed.

1.6 Definition of terms

- Internet Banking – refers to the access of banking services through the use of computers that are connected to the internet (Yu, 2012).
- Mobile Banking - Mobile banking refers to the "interaction in which a customer is connect to a bank via a mobile device such as a cell phone, smartphone or personal digital assistant (PDA)" (Laukkanen and Kiviniemi, 2010). This includes both visiting internet websites through the use of mobile devices, interactions through mechanism such as short messaging services (SMS) as well as mobile applications.

1.7 Assumptions

The following assumptions have been made regarding the study:

- The total number of responses received and data collected would be adequate. Failure to collect adequate data would not be statistically viable, having an effect on the validity of the study.
- The sample population will represent the general views of mobile banking consumers. Non-representative views will skew results and affect generalisability of the study.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter reviews the current technology acceptance and technology readiness literature. Also highlighted is the need for technology acceptance models to be extended in order to be more suitable to understand post-adoption factors in the usage of technology. The current state of mobile banking literature is also reviewed. This identifies a large number of studies to be focused on predictors of mobile banking adoption as opposed to the sustained use of mobile banking. This study aims to provide further understanding of sustained use of mobile banking by developing a model based on prior literature and incorporating usage factors. Hypotheses are presented based on the review of literature, followed by the presentation of the proposed model.

2.2. Background

Mobile banking services and its consumption has been identified as an important area for academics, practitioners and firms (Laukkanen and Kiviniemi, 2010). The potential of financial institutions to highly differentiate themselves by adequately utilising this channel makes it highly lucrative. Mobile banking refers to the “interaction in which a customer is connect to a bank via a mobile device such as a cell phone, smartphone or personal digital assistant (PDA)” (Laukkanen and Kiviniemi, 2010). This includes both visiting internet websites through the use of mobile devices, interactions through mechanism such as short messaging services (SMS) as well as mobile applications.

Mobile banking provides huge potential as they can be seen as “mobile terminals” offering a myriad of services ranging from account payment, money transfers, account balance enquiry and other banking services (Zhou, 2012). This potential is exemplified by the huge growth and adoption of mobile devices (Yu, 2012). Further, one can expect an additional usage base from users that are more familiar with mobile devices. This is preferred over complex personal

and laptop computers (Ropers, 2001). It is expected that the convenience and simplicity of mobile banking would attain high adoption rates (Wu and Wang, 2005). However, research suggests that the consumption of mobile banking services has been relatively slow compared to the use of traditional internet banking (Cruz et al., 2010; Kang et al., 2012; Yu, 2012).

A review of the literature found there to be a high number of online internet banking studies compared to a relatively limited number of mobile banking ones (Suoranta and Mattila, 2004; Laukkanen and Pasanen, 2008; Püschel et al., 2010; Yu, 2012). This identifies the need for more mobile studies. Further, the majority of the current mobile banking studies are primarily focused around the antecedents of mobile adoption (Wu and Wang, 2005; Kang et al., 2012; Yu, 2012). Although these studies provide useful insight into the factors that contribute to the successful adoption of mobile banking services, more research is required in the post-adoption phase. Research in the post-adoption phase will provide deeper understanding of mobile usage behaviour and factors that promote sustained use (Wu and Wang, 2005; Kang et al., 2012).

2.4.1 Technology Acceptance

Various technology acceptance models have been utilised to predict users' intention to adopt mobile banking services. These have been in the form of popular models such as: 1) The Theory of Reasoned Action (Fishbein and Ajzen, 1975); 2) Theory of Planned Behaviour (Ajzen, 1991); 3) The Technology Acceptance Model (Davis, 1989) and 4) The Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis and Davis, 2003). These models are similar in their theoretical foundation. Users evaluate a particular technology based on three major factors, namely: 1) usefulness; 2) ease of use and 3) social influence (Fishbein and Ajzen, 1975; Davis, 1989; Ajzen, 1991; Venkatesh et al., 2003; Kang et al., 2012). A decision is then made to either adopt or reject the technology based on their assessment of these factors. Although these models have been widely use to estimate adoption, there has been no single one that accurately predicts the extent of the usage (Kang et al., 2012). Further, it has been argued that factors influencing usage behaviour

differ between the pre-adoption to the post adoption phases (Bhattacherjee, 2001b). The post adoption phase thus requires more factors to be recognised than just usefulness and ease of use (Kang et al., 2012). It is therefore suggest that technology models be extended in to better understand post-adoption states.

2.4.2 Technology Readiness

The introduction of new technologies requires an understanding of consumers ability and willingness to use them (Meuter, Ostrom, Bitner and Roundtree, 2003). The concept of Technology Readiness (TR) has been created to gain insight into consumers use of new technology to accomplish their goals (Parasuraman, 2000). Parasuraman (2000) defines TR as a multidimensional psychographic construct that can be classified into four dimensions: optimism – a favourable view of technology; innovativeness – the propensity to be technological pioneer; discomfort - the inability of the individual to control the technology; and insecurity – the lack of trust individuals have towards technology and its ability to function adequately. Technology anxiety is a similar concept to TR, however, it has been identified to have a narrower focus and is sometimes preferred due to its focus on the users' ability to utilise the new technology (Meuter et al., 2003).

Various studies have identified TR and technology anxiety to be an important factor that impacts technology adoption and usage (Kjerulff, Pillar, Mills and Lanigan, 1992; Koufaris, 2002; Liljander, Gillberg, Gummerus and van Riel, 2006; Lee, 2010; Yieh, Chen and Wei, 2012). However, there has been a limited number of studies focusing on the effect of technology anxiety on the use of mobile banking services in the post-adoption phase (Kang et al., 2012). It is therefore recommended that more studies be focused around technology anxiety in the post adoption phase of mobile banking.

2.4.3 Information Quality

Information quality involves the quality of content that the system produces (Wang and Wang, 2010). Information quality has been studied in isolation and together with other system related characteristics such as system and service quality (DeLone and McLean, 1992, 2003; Boritz, 2005; Pearson, Tadisina and Griffin, 2012). Information quality is also identified to have multiple views and contexts (Nelson, Todd and Wixom, 2005). This study defines information quality as the degree to which users receive relevant, understandable, reliable, adequate, precise and usable information from mobile services (McKinney and Yoon, 2002). Prior studies identify it to be an important factor in the evaluation of technology (Zeithaml, Parasuraman and Malhotra, 2002; Kim and Niehm, 2009; Pearson et al., 2012).

2.4.4 e-Service Quality

The traditional definition of service quality refers to the capability of different mechanisms to process customer complaints, assist users to consume the product, make recommendations and troubleshoot (Bhattacherjee, 2001a). However, in an online technology environment, human interaction is not a pre-requisite for the service encounter (Pearson et al., 2012). Therefore mobile e-service quality attempts to meet customer expectations without the necessary involvement of people. Parasuraman, Zeithaml and Malhotra (2005) recommend four dimensions on which to measure the service quality of an online service. These dimensions are: 1) efficiency; 2) fulfilment; 3) system availability and 4) privacy. This study defines mobile service quality along these dimensions.

2.4.5 Perceived Value of Mobile Services

Perceived value is generally described as the users assessment of the net utility realised from the users perception of the benefits received versus the costs expended (Zeithaml, 1988; Pearson et al., 2012). These benefits can be described in a myriad of ways depending on the study context (Wu and Wang,

2005; Yang, 2009; Cruz et al., 2010; Pearson et al., 2012; Yu, 2012). Kang et al. (2012) defined the construct of perceived value of mobile services to be primarily attributed to the extent of the monetary value either received or sacrificed during the consumption of the service. Although monetary constructs were found to influence perceived value, it is recommended that other constructs be explored. For instance, as identified by Kim and Niehm (2009), the perceived value of an online technology is more closely related to the likelihood of return visits to the site.

Due to the fact that perceived value can be influenced by experience attribute and not exclusively monetary value. It can also be defined as the interactive, relativistic, preference experience of the customer (Holbrook and Corfman, 1985; Steenkamp and Geyskens, 2006; Pearson et al., 2012). According to Pearson et al. (2012), the interactive experience of mobile services exists due to the fact that the consumer influenced by the reaction of their personal attributes (age, gender, etc.) with the characteristics of the systems (information quality, system quality, etc.). The relativist experience exists due to the fact that each consumer will attribute a personal value to the system based on their personal judgement. Lastly, the preference aspect of a mobile service is based on the consumers' evaluation of the service. It can therefore be posited that a favourable evaluation of the e-service and information quality characteristics of a mobile service would lead to a positive judgement of the service. This will determine its preference amongst a set of alternatives and sustained use of the service. Therefore hypothesis 1 and 2 are proposed as follows:

H1: A positive association exists between information quality and perceived value

H2: A positive association exists between e-service quality and perceived value

2.4.6 Trust

Online transactions contain greater uncertainty and risk due the lack of face-to-face human interaction compared to traditional in brick-and-mortar businesses (Van der Heijden, Verhagen and Creemers, 2003; Zhou, 2012). Trust is

identified as an important construct to reduce perceived risk in online transacting (Casaló, Flavián and Guinalíu, 2007; Zhou, 2012). For example, user evaluations of trust indicators (such as reputation, appearance and performance) of an online website, can have an impact in the overall trustworthiness of the site (Van der Heijden et al., 2003). Online trust is identified to be measured across the dimensions of website, user and company based determinants (Van der Heijden et al., 2003; Zhou, 2012). Similar to online websites, trust is a major factor in the consumption of mobile services and should be managed accordingly (Varnali and Toker, 2010). Lin and Wang (2006) indentify that trust of mobile services were found to be an important contributor to user satisfaction and loyalty. Therefore hypothesis 3 and 4 are proposed as follows:

H3: A positive association exists between information quality and trust

H4: A positive association exists between e-service quality and trust

2.4.7 Sustained Use of Mobile Banking Services

Kang et al. (Kang et al., 2012) extended the TAM model to explain the sustained usage of mobile services. They defined sustained use as the extent to which users consumed mobile banking services over an extended period of time. It identified to be a multidimensional concept consisting of four primary components: frequency – the change in usage of mobile banking services; proportion – the preference of banking channel, stability – the continued use of mobile banking services, and infusion – incorporation of mobile banking services into daily life activities. This study uses this definition of sustained use as it is more applicable to mobile banking usage. Other definitions appear to be more applicable to internet banking loyalty (Parasuraman et al., 2005; Flavián and Guinalíu, 2006). Therefore hypothesis 5 and 7 are proposed as follows:

H5: A positive association exists between perceived value and sustained use of mobile services

H6: A positive association exists between trust and sustained use of mobile services

2.4.8 Technology Anxiety

Meuter et al. (2003) identify that technology anxiety has specific focus on the users' state of mind towards their ability and willingness to utilise new technology. Their findings were that higher levels of new technology usage were positively associated with lower levels of technology anxiety. Mobile banking is a relatively new technology and is expected to have high levels of technology anxiety. These levels of anxiety are predicted to have an influence on the use of mobile services. McMullan (2005) argues that moderator variables have a high importance as they provide deeper insight into relationships between constructs. This deeper understanding could improve decision making with regards to the promotion of the sustained use of mobile services. Therefore hypothesis 7 and 8 is proposed as follows:

H7: Technology anxiety moderates the perceived value-sustained use link; such that the relationship between perceived value and sustained use is stronger for consumers with a low level of technology anxiety

H8: Technology anxiety moderates the trust-sustained use link; such that the relationship between trust and sustained use is stronger for consumers with a low level of technology anxiety

2.3. Conclusion of Literature Review

The literature review identifies that there are a high number of online internet banking studies compared to a relatively low number of mobile banking ones. This identifies the need for more mobile studies. Further, the majority of the mobile banking studies are primarily focused around the antecedents of the intention to adopt mobile banking. It is therefore recommended that more studies be done in the post adoption phase. These studies will use actual system usage factors such as information and e-service quality. This would provide deeper understanding of mobile usage behaviour and factors that

promote sustained use. Trust and technology factors are also expected to have an influence on the sustained use of mobile banking services. Figure 1 presents the proposed research model based on the above literature review. This is followed by the statement of all the study hypotheses.

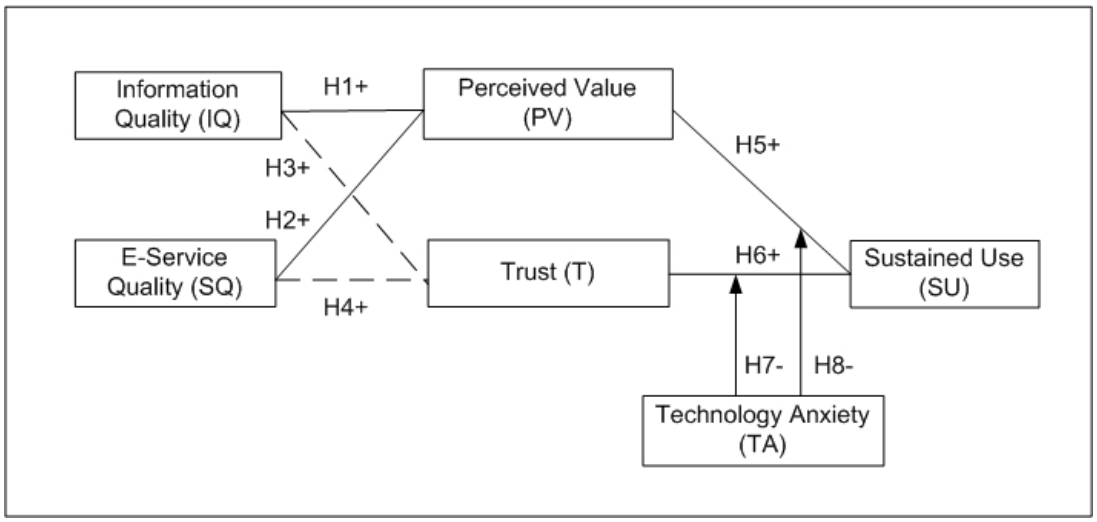

Figure 1: Proposed Research Model

The hypotheses will be stated as the following:

H1: A positive association exists between information quality and perceived value

H2: A positive association exists between e-service quality and perceived value

H3: A positive association exists between information quality and trust

H4: A positive association exists between e-service quality and trust

H5: A positive association exists between perceived value and sustained use of mobile services

H6: A positive association exists between trust and sustained use of mobile services

H7: Technology anxiety moderates the perceived value-sustained use link; such that the relationship between perceived value and sustained use is stronger for consumers with a low level of technology anxiety

H8: Technology anxiety moderates the trust-sustained use link; such that the relationship between trust and sustained use is stronger for consumers with a low level of technology anxiety

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter reviewed existing literature to develop a model to explain sustained mobile use in the post adoption phase of mobile banking. This section explains the methodology that was followed on order to conduct this research. The chosen quantitative approach will be explained, followed by the research design considerations, data collection, and analysis procedures.

3.2 Research methodology / paradigm

Quantitative, qualitative and mixed method approaches have been deemed appropriate for the study of social sciences (Johnson and Onwuegbuzie, 2004). This study utilised the quantitative approach to understand the phenomena from a numerical perspective. This had the benefit of providing strong scientific evidence to establish relationships between constructs and validate hypotheses (Schrag, 1992). Further, the ability of quantitative methods to rapidly and accurately facilitate large sample sizes was preferred over the deeper insight provided by qualitative and mixed methods (Vanderstoep and Johnston, 2009). The quantitative method was thus selected to gain an understanding of usage characteristics and the factors that promote sustained use of mobile services.

3.3 Research Design

The research instrument that was utilised was in the form of a self-administered online survey. This instrument was chosen due to its ability to facilitate a large sample size at a relatively low cost. A review of similar studies also provided support for the chosen instrument (Kim and Niehm, 2009; Westjohn, Arnold, Magnusson, Zdravkovic and Zhou, 2009; Cruz et al., 2010; Kang et al., 2012; Pearson et al., 2012; Zhou, 2012).

3.4 Population and sample

3.4.1 Population

The population relevant to this study is individuals that use mobile banking in South Africa.

3.4.2 Sample and sampling method

Non-random, convenience sampling employing the snowball method was used for this study. Personal contacts were sent an email indicating that they had been invited to participate in a survey (see appendix A1). Respondents were also asked to identify and forward the email to other respondents. Snowballing methods are regarded as a suitable approach when the study has time and financial limitations (Llewellyn, Sullivan and Minichiello, 1999; Etter and Perneger, 2000). It was therefore deemed appropriate for this study and subsequently followed. This approach resulted in a total of 205 returned online surveys from an initial mail distribution list of 500 emails.

3.4.3 Sample demographics

Table 1 presents the demographic characteristics. The sample was largely made up of males (59.2%) with a high number of participants between the ages of 26 to 35 years (50.5%). Respondents were allowed to choose more than one method of mobile banking. The most popular method of was identified to be accessing internet banking sites via the phones browser (72.45%), compared to 55.61% that utilised native applications and 35.71% that used SMS device menus.

Table 1: Demographic Attributes of the Respondents

	Frequency	Percentage (%)	Cumulative
1. Gender			
Female	74	37.8	37.80
Male	116	59.2	100.00
2. Age[a]			
18-25 years	9	4.6	4.60
26-35 years	99	50.5	55.10
36-45 years	60	30.6	85.70
>46 years	28	14.30	100.00
3. Work Experience			
<1 year	2	1.00	1.00
1 - 5 years	26	13.70	14.70
6 - 10 years	64	33.70	48.4
10 -15 years	36	18.90	67.30
>15 years	62	32.70	100.00
4. Highest Level of Education			
High School	33	17.40	17.40
Certificate or Diploma	70	36.80	54.20
Bachelors Degree	38	20.00	74.20
Postgraduate and Above	49	25.80	100.00
5. Method of Mobile Banking[b]			
Browser on Mobile Phone	142	72.45	-
Native Mobile Application	109	55.61	-
SMS / Mobile Device Menu	70	35.71	-

Notes: [a] The date of birth was used to calculate the respondent's age. [b] Respondents could select more than one method of mobile banking.

Table 2 presents the utilised methods of mobile banking according to gender, age, work experience and education. Table 2 also shows that 62.10% of male respondents prefer to use the native mobile application to do mobile banking as opposed to 44.59% of females. It can be seen that individuals over 46 years of age used their mobile browser to do mobile banking (85.71%) as opposed to other age groups. Respondents with the highest level of education to be bachelors' degree were identified to be the highest users of the SMS method.

Table 2: Methods of Mobile Banking						
	Browser	**(%)**	**Native**	**(%)**	**SMS**	**(%)**
1. Gender						
Male	86	74.14	72	62.10	38	32.76
Female	53	71.62	33	44.59	30	40.54
2. Age[a]						
18-25 years	4	44.40	6	66.6	4	44.44
26-35 years	67	67.67	58	58.59	39	39.39
36-45 years	47	78.33	31	51.67	22	36.67
>46 years	24	85.71	14	50.00	5	34.69
3. Work Experience						
<1 year	-	-	2	100.00	-	-
1 - 5 years	18	69.23	14	53.85	12	46.15
6 - 10 years	46	71.86	33	51.56	25	39.06
10 -15 years	26	72.22	24	66.67	13	36.11
>15 years	49	79.03	32	51.61	18	29.03
4. Highest Level of Education						
High School	25	75.75	15	45.45	7	21.21
Certificate or Diploma	51	72.86	39	55.71	30	42.86
Bachelors Degree	25	73.68	25	65.79	14	77.78
Postgraduate and Above	38	77.55	26	53.06	17	34.69

Note: [a] The date of birth was used to calculate the respondent's age.

3.1 The research instrument

The self-administered survey consisted of demographic variables and five independent constructs. These constructs were measured in order to examine their possible effects on the use of mobile banking. Demographic variables consisted of questions regarding gender, age, job role, work experience and education. The five independent constructs measured consisted of: 1) information quality; 2) e-service quality; 3) perceived value; 4) trust and 5) technology anxiety. These constructs were measured through statements adapted from the literature. They are discussed in detail in the next section.

3.1.1 Measurement of the variables

All statements were present on a 101 Likert-type point scale anchored from (strongly disagree) and 100 (strongly agree) unless stated otherwise.

Sustained Use: The study used Kang *et al.'s* (2012) 4-item scale of sustained mobile use. Sample items were 'I've been using mobile banking increasingly since I first used it', 'I use mobile banking more than any other banking services (face-to-face banking, ATM, internet banking or telephone banking) these days', 'I have been using mobile banking continuously ever since I first used it', 'mobile banking has become a critical part of my banking activities'. Factor items loaded successfully and the 4 items were combined to form the sustained use construct (Cronbach α = .79).

Perceived Value: Statements measuring information quality, e-service quality and perceived value were adapted from Pearson *et al.* (2012). perceived value was measure across 5 items. Information quality consisted of 6 dimensions (relevance, understandability, reliability, adequacy, scope and usefulness) measured across 23 items. Lastly, e-Service quality consisted of 4 dimensions (efficiency, systems availability, fulfilment and privacy) measures across 22 items. All items were modified in order to be more applicable to the mobile banking context. For example, "this site makes it easy to find what I need" was modified to read "the mobile banking application makes it easy to find what I need". The information quality statements were presented on a 101 semantic difference scale anchored with 0 (*not important at all*) and 100 (*extremely important*). After the removal of 7 items, perceived value (Cronbach α = .75), information quality (Cronbach α = .80) and e-service quality (Cronbach α = .75) loaded successfully.

Technology anxiety: The study used Meuter *et al.* (2003) 5-item scale of technology anxiety. These were found to be directly applicable to the study context and were incorporated unchanged. Scale items were "I am confident I can learn technology related skills", "I have difficulty understanding most technological matters", "I feel apprehensive about using technology", "I am not able to keep up with technological advances", "I have more self-confidence than

most people". Items loaded successfully across the technology anxiety construct (Cronbach α = .83).

Trust: Trust was measure according to Zhou's (2012) 3-item scale. Statements were:"mobile banking is trustworthy", "mobile banking keeps it promises" and "mobile banking keeps customers' interests in mind". Scale items were found to be reliable and aggregated accordingly (Cronbach α = .74). Appendix A2 presents all the questionnaire items and dimensions.

3.2 Pre-test and pilot

The online survey was pre-tested amongst 15 students and two senior lecturers from the University of the Witwatersrand. They were asked to provide feedback face and content validity. This included providing critique on the clarity of scale items, survey appearance and the time taken to complete it. Comments received were largely positive. However some concerns were raised around grammar and wording. For example, "Please indicate which methods of Mobile Banking you utilise?" was preferred over: "Tick the appropriate box". These grammar and wording changes were made and the questionnaire was submitted for further evaluation to a pilot group.

The pilot group consisted of 15 work colleagues that consented to be used as test participants for the study. All test participants acknowledged that they were currently using mobile banking at the time. They were asked to critique the survey along the same criteria as specified in the pre-test. Some presentation recommendations were made. A number of people felt that the background colour of the survey was too bright and rather distracting. This was subsequently changed to a dimmer, less intrusive colour. The finalised version of the questionnaire was then distributed to the study sample.

3.3 Procedure for data collection

An email containing the cover letter (see Appendix A1) and the link (URL) to the online survey was mailed to every person on the contact list. The survey was specified to be purely voluntary. Confidentiality and anonymity were also

guaranteed. The data collection process spanned 4 weeks, with participants being able to respond to the surveys at any time by clicking on the URL contained in the email. Reminder emails were sent at the end of each week to encourage participation. To increase response rate, study results were offered as incentive. Researcher contact details were contained in the cover letter for all participants to request a summary of the study's findings.

3.4 Data analysis and interpretation

Data was loaded into the SAS statistical program. In totality, 205 responses were received from a total of 500 emails that were sent (response rate = 41%). Six statements on the survey were negatively worded (three for perceived value; three for technology anxiety). These scores were therefore reversed. Observations that exceeded more than 10% percent of missing values were deleted. This resulted in 19 records being deleted from the dataset. Other missing values were replaced by the series mean where appropriate. The remaining 196 responses were examined for potential outliers. This was done by scanning for scores that were greater than or less 3 standard deviations. No outliers were detected and the dataset remained at 196 respondents (*n* = 196). Table 3 presents a summary of the responses that were received.

Table 3: Summary of Responses Received

	Number of Responses	Percentage (%) Received
Total Received	205	100
Removed as Incomplete[a]	19	9.27
Total Usable Responses	196	95.60

Note: [a] Responses with >10% missing values were deleted.

Confirmatory factor analysis (CFA) was utilised to assess the measurement of the scale items and their relation to constructs. The CFA was conducted through the structural equation modelling (SEM) approach. The SEM approach was selected due to its ability to factor in the extent of interaction, correlation and error amongst multiple variables (Nasser and Takahashi, 2003). SEM goodness-of-fit measures were to evaluate scale items and to test the model.

SEM also used to calculate the strength between variables. Hypotheses exceeding significance levels of greater than 0.05 were rejected.

To test whether technology anxiety will moderate the relationships between perceived value and sustained use as well between trust and sustained use, the procedure by Aiken, Reno and West (1991) was followed. The values of technology anxiety and perceived value were therefore centred (each score subtracted from the mean) and multiplied to create an interaction variable. Hierarchical regression was then performed with the first stage model consisting of the technology anxiety and perceived value variables and the second stage model including the addition of the interaction variable. This was repeated with the technology anxiety and trust variables. The difference in R^2 indicated the strength of the moderation effect.

3.5 Validity and reliability of constructs

Reliability is concerned with the degree to which research findings are consistent over time (Bryman, 2004). This includes the extent to which the total population under study is accurately represented. Reliability can be statistically measured by using the Cronbach's Alpha (Gefen, Straub and Boudreau, 2000). In order to promote the reliability of the survey instrument utilised in this study, only previously validated scale items were adopted from previous research (Meuter et al., 2003; Kang et al., 2012; Pearson et al., 2012; Zhou, 2012). All items adopted were identified to have a reliability of over 0.7. This is classified as a relatively high measure in the statistical domain (Field, 2009).

Validity is concerned with the appropriateness of the instrument used for data collection in relation to the study context and if the scale items actually measured what they intended to measure (Saunders, Lewis and Thornhill, 2009). Validity is therefore seen as a critical factor in determining the strength of study findings and recommendations (Vanderstoep and Johnston, 2009). Validity is a multi-dimensional component consisting of a number of components. The components that are most applicable to this study are content, construct, and external validity. Content validity refers to the extent that

survey scale items or behaviours completely model the concept being measured (Vanderstoep and Johnston, 2009). As discussed earlier, to promote content and face validity, participants were asked to critique and comment on the questionnaire in the pre-test and pilot phase.

Construct validity is concerned with the degree to which what was to be measured was actually measured (Saunders et al., 2009). Expropriations can therefore be made on these operationalised scale constructs. Construct validity has two major components: 1) convergent validity – this refers to the high correlations between scale items that measure the same construct; 2) discriminant validity – this refers to the low correlations between scale items of different constructs (Welman, Kruger and Mitchell, 2005). Convergent validity was promoted by the adoption of scales from previous literature where strong evidence had been presented on validity (Meuter et al., 2003; Kang et al., 2012; Pearson et al., 2012; Zhou, 2012). In order test discriminant validity, confirmatory factor analysis (CFA) was utilised. CFA evaluates the patterns of data scores and their relative strength to the construct under review (Nasser and Takahashi, 2003). The research can therefore identify which scale items load on the same construct and can therefore be grouped together or deleted (Maree, 2007).

Initial confirmatory factor analysis was done using Harman's single-factor test to evaluate the fit of the data to a single factor. The data fit structural equation modelling (SEM) pre-requisites. This included homoskedasticity, normality, linearity and low multicollinearity. Model fit was evaluated by looking at several goodness-of-fit indices, namely chi-square, SRMSR, RMSEA, CFI and NNFI. The resultant model was however found to possess poor fit metrics and was rejected. The fact that the data did not fit the single factor test indicated some level of discriminant validity. As the single factor model did not fit the data, a CFA analysis was attempted with latent factors as hypothesized by the research model.

The CFA with latent factors indicated that 4 scale items cross-loaded across more than one factor. These items were removed and the CFA re-run. Table 4 presents the fit of the revised model. Table 4 also shows that the revised model

possesses good fit metrics. The RMSEA interval is below .10, the CFI and NNFI are greater than .90, the SRMSR is equal to .06 and the other fit indices appear favourable. The model was therefore deemed to have an overall good fit and accepted.

Table 4: Fit Statics for Revised CFA Model (N = 196)

	'Good" fit ranges[a]	**Model 1: Revised Model CFA**
$\chi 2$	Non-significance[b]	257.55(109)***
SRMSR	<.10 preferably <.05	.06
RMSEA	< .10 preferably even < .05 - .08	.0.08 (.07 – 0.01)
CFI	> .90 - .95	.94
NNFI	> .90 - .95	.92

Notes. [a] Metrics for good fit are based on discussions such as Hair *et al. (1998)*, they are contestable. [b] Significance in the chi-square is highly dependable on sample-size and is not typically not taken as poor fit necessarily.*** = p < .001.

External validity involves the extent to which generalisations can be made based on the sample studied (Saunders et al., 2009). It is recommended to replicate this study across different populations to verify results and analyse generalisability.

3.6 Limitations of the study

The self-administered online survey is the primary data collection method, it is therefore susceptible to common method bias. In order to minimise this bias, procedures were followed as mentioned by Podsakoff, MacKenzie, Lee and Podsakoff (2003). This involved adoption of validated scales from previous research, the protection of respondent anonymity to reduce apprehension and the counterbalancing of question order.

Non-random convenience sampling with the snowballing method was utilised. A possible limitation with this method of sampling is that the sample may not be representative of the overall population (Vanderstoep and Johnston, 2009). Also, snowball samples have been largely critiqued for their susceptibility to contain direct bias, however are still considered as valid and acceptable for the

study of social science due their ability to maintain integrity between variable relationships (Etter and Perneger, 2000). Another limitation is the possibility of self-reporting bias, a known risk when using self-administered surveys. This needs be acknowledge as actual values may be difference from reported ones. Although, this bias can be minimised by the introduction of a third party to observe and capture data, it is too costly and time consuming for this study (Vanderstoep and Johnston, 2009). There is also a possibility of specification bias due to the omission of variables. For example, user resistance could also have an influence on sustained use. Due to a technology acceptance approach, all constructs influencing sustained use were not included, instead only system related dimensions were used.

3.7 Conclusion

This chapter outlined the quantitative approach chosen for this study. As discussed, the research instrument selected will be in the form of a self-administered online survey. Data collected from this survey will then be used to report and analyse outcomes. Some limitations were identified and acknowledged. The next chapter presents the results of the statistical analysis and approach as described in this chapter.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

The previous chapter explained the quantitative methodology that was utilised to conduct this research. This included the research design considerations, data collection, the demographic profile and analysis procedures. This chapter presents the results and analysis of the study sample. This includes correlation, structured equation modelling and moderation results. The chapter concludes with a report and major findings and their effect on the proposed study hypotheses.

4.4 Correlation and SEM Analysis

This section discusses the correlation and analysis that was performed in order to identify relationships between variables. Figure 2 presents the research model with hypotheses.

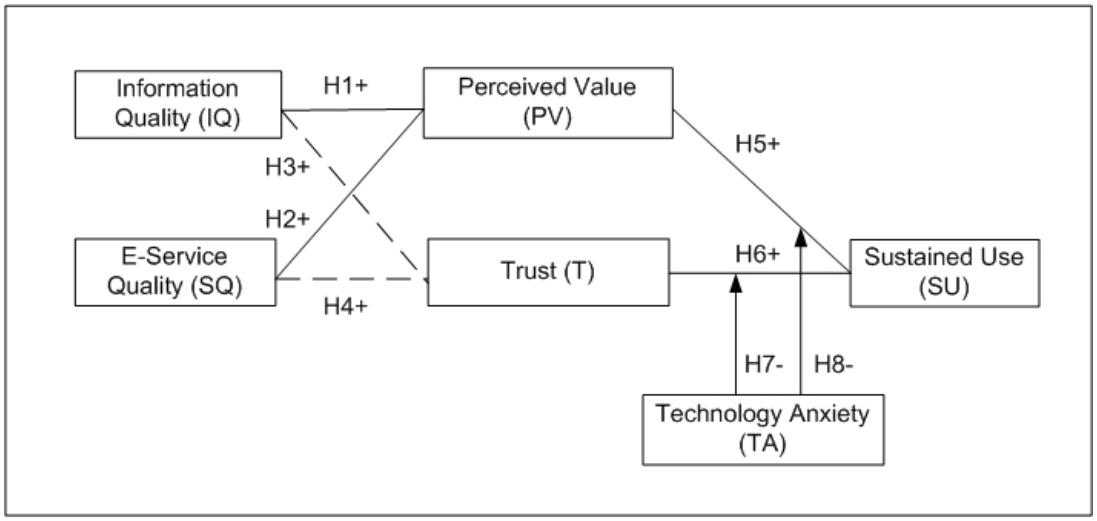

Figure 2: Proposed Research Model

Table 5 presents the correlations and descriptive statistics for aggregated variables. As can be seen, significant correlations exist for all hypothesized paths. Information quality has significant first order correlations between

perceived value (r = .44, p < 0.001) and trust (r = .44, p < 0.001). e-Service quality has correlations between perceived value (r = .50, p <0.001) and trust (r = .74, p < 0.001). Use has significant correlations with perceived value (r = .72, p < 0.001) and trust (r = .61, p < 0.001). Lastly, technology anxiety has weak correlation with perceived value (r = .28, p < 0.001), trust (r = .22, p < .005) and use (r = .16, p < 0.05).

Table 5: Correlations and Descriptive Statistics (N = 196)

	M	SD	1	2	3	4	5	6
1. Information Quality	87.46	11.42	(.80)	.46	.44	.44	.28	.31
2. Service Quality	74.10	15.26	.46	(.75)	.50	.74	.25	.52
3. Perceived Value	88.13	15.55	.44	.50	(.75)	.56	.28	.72
4. Trust	76.81	16.75	.44	.74	.56	(.74)	.23	.61
5. Technology Anxiety	17.31	13.47	.28	.25	.28	.23	(.83)	.16
6. Use	69.96	26.53	.30	.52	.72	.61	.16*	(.79)

Notes: All correlations significant at p < .005. * = p < 0.05 Cronbach alphas in parentheses

As described above, the correlation analysis identified significant relationships between variables. However, it does factor in the extent of interaction, correlation and error amongst multiple variables (Nasser and Takahashi, 2003). In order to incorporate the interaction amongst multiple variables and determine their relationships, structural equation modelling via path analysis was utilised. Table 6 presents the fit of the SEM model. Table 6 also shows that the SEM model possesses good fit metrics. The RMSEA interval is below .10, the CFI and NNFI are greater than .90, the SRMSR is equal to .05 and the other fit indices appear favourable. The model was therefore deemed to have an overall good fit and accepted. Figure 3 presents the final standardized path coefficients and Table 7 shows the direct, indirect and total path effects and R^2 statistics for endogenous variables.

Table 6: Fit Statics for Structural Equation Model via Path Analysis (N = 196)

	'Good" fit ranges[a]	Model 2: SEM (Path Analysis)
$\chi 2$	Non-significance[b]	277.12 (112)***
SRMSR	<.10 preferably <.05	.06
RMSEA	< .10 preferably even < .05 - .08	.08 (.07 - .01)
CFI	> .90 - .95	.93
NNFI	> .90 - .95	.92

Notes. [a] Metrics for good fit are based on discussions such as Hair *et al. (1998)*, they are contestable. [b] Significance in the chi-square is highly dependable on sample-size and is not typically not taken as poor fit necessarily. *** = p < .001.

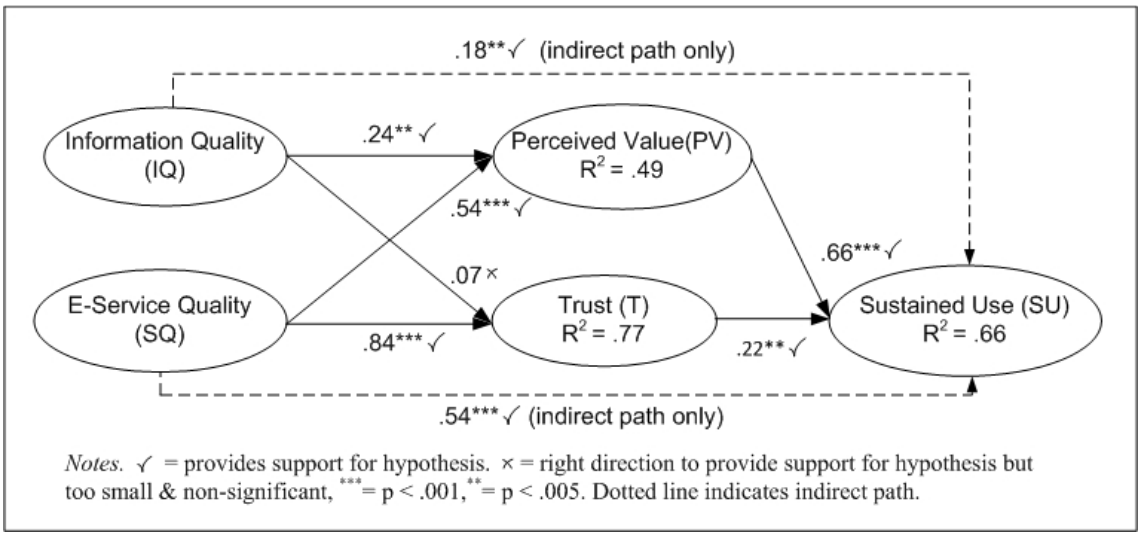

Figure 3: SEM Path Model (Standardised Coefficients)

Table 7: SEM Effects Decomposition and R2 for Main Outcome Variables

	Trust			Use			Value		
	B	**SE**	**β**	**B**	**SE**	**β**	**B**	**SE**	**β**
Trust									
Direct Effect	-	-	-	.29ǂ	.10	.22ǂ	-	-	-
Indirect Effect	-	-	-	-	-	-	-	-	-
Total Effect	-	-	-	.29ǂ	.10	.22ǂ	-	-	-
Use									
Direct Effect	-	-	-	-	-	-	-	-	-
Indirect Effect	-	-	-	-	-	-	-	-	-
Total Effect	-	-	-	-	-	-	-	-	-
Value									
Direct Effect	-	-	-	.65†	.08	.66†	-	-	-
Indirect Effect	-	-	-	-	-	-	-	-	-
Total Effect	-	-	-	.65†	.08	.66†	-	-	-
Information Quality									
Direct Effect	.07	.07	.07	-	-	-	.33ǂ	.11	.24ǂ
Indirect Effect	-	-	-	.24ǂ	.08	.18ǂ	-	-	-
Total Effect	.07	.07	.07	.24ǂ	.08	.18ǂ	.33ǂ	.11	.25ǂ
e-Service Quality									
Direct Effect	.65†	.07	.84†	-	-	-	.57†	.08	.54†
Indirect Effect	-	-	-	.56†	.07	.54†	-	-	-
Total Effect	.65†	.07	.84†	.56†	.07	.54†	.57†	.08	.54†
R 2		.77			.66			.49	

Note: (*) = $p < 0.05$; (ǂ) = $p < 0.005$; (†) = $p < 0.001$

In the final path model, two factors directly influence sustained use. Most valuable is a relatively large effect from perceived value (β = .66, $p < 0.001$). This is followed by a small effect from trust (β = .22, $p < 0.005$). There are also two indirect paths effecting sustain use. This includes a moderate effect from e-Service quality (β = .54, $p < 0.001$) and a small effect from information quality (β = .18, $p < 0.005$). These findings provide support for hypothesis H5 and H6. These hypotheses posit that perceived value and trust are positive antecedents for sustained use. In totality, the model explains variance in sustained use in the magnitude of R^2 = .66. This is commendable in comparison to other studies in the field with many possible antecedents.

As expected, perceived value is directly increased by e-Service quality (β = .54, $p < 0.001$) and information quality (β = .24, $p < 0.005$). This provides support for

hypotheses H1 and H2. Trust is directly increased by e-Service quality (β = .84, p < 0.001), however information quality was found to have a small, non-significant effect ((β = .07). Hypothesis H4 was is therefore supported with no support offered for hypothesis H3.

4.3 Moderation Analysis

In order to test whether technology anxiety had an influence on the relationships between trust on sustained use and perceived value on sustained use, moderation analysis was performed. Figure 4 presents these relationships. As suggested by Aiken and West (1991), hierarchical regression was conducted to test the effect of the independent variables over the interaction variables on sustained use. Separate analysis was performed for both relationships. Results indicated no significance at the 0.01 level (p < 0.01). It is therefore suggested that little or no moderation effect exists on the relationships between trust on sustained use and perceived value on sustained use. This result is supported by the weak correlation between technology anxiety with perceived value (r = .28, p < 0.001), trust (r = .22, p < .005) and use (r = .16, p < 0.05). Hypotheses H7 and H8 are therefore rejected.

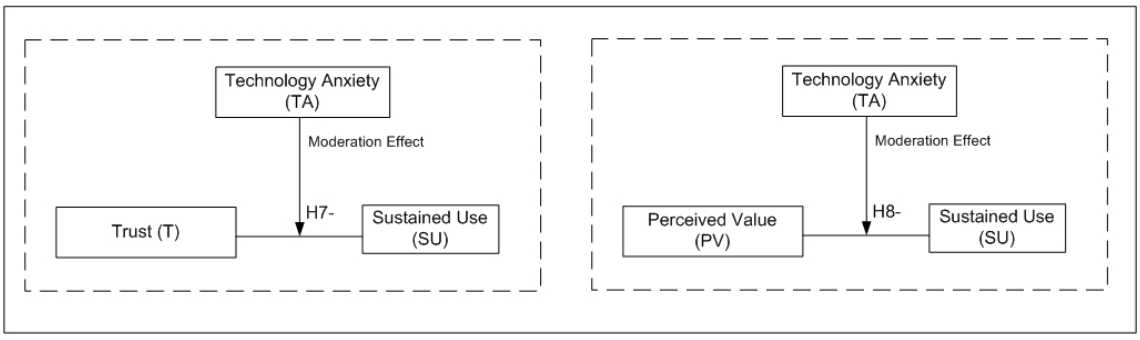

Figure 4: Test for Moderation Effect of Technology Anxiety

4.4 Conclusion

This chapter presented the demographic profile, results and analysis of the sample of 196 respondents. As discussed, the initial single factor CFA was rejected due to poor fit values. The CFA with latent factors as hypothesized was

therefore performed. This resulted in good fit metrics and the model was accepted. SEM with path analysis was then used to determine standardised path co-efficients. Findings were that perceived value had the largest effect on sustained use (β = .66, $p < 0.001$). It was also identified that the model explained the sustained use of mobile banking to the magnitude of R^2 = .66. This was highly commendable in comparing to similar studies. Moderation analysis was also performed to determine the effect of technology anxiety. No major effects that were found. Table 8 presents a summary of the study findings.

Table 8: Summary of Hypotheses

Number	Path	Pearson's Correlation	Standardised Beta Coefficients	Outcome
H1	Information Quality → Perceived Value	.52**	.24*	Accepted
H2	e-Service Quality → Perceived Value	.56**	.54***	Accepted
H3	Information Quality → Trust	.43**	.07	Rejected
H4	e-Service Quality → Trust	.72**	.84***	Accepted
H5	Perceived Value → Sustained Use	.74**	.66***	Accepted
H6	Trust → Sustained Use	.57**	.22***	Accepted
H7	Technology Anxiety → Perceived Value and Sustained Use	.43**;.25**	-	Rejected
H8	Technology Anxiety → Trust and Sustained Use	.31**;.25**	-	Rejected

Notes: (*) = $p < 0.05$. (**) $p < 0.01$. (***) $p < 0.001$

As depicted, H1, H2, H4, H5, H6 were accepted whereas H3, H5, H7 and H8 were rejected. The next chapter reports on study findings and discusses hypotheses in detail.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

The previous chapter presented the results and analysis of the sample. This included a report on the study findings and their effect on proposed hypotheses. This chapter discusses these findings in detail. This involves a discussion on the findings and their influence on the sustained use of mobile banking. The chapter concludes with similar discussions on perceived value and trust.

5.2 Sustained use of mobile banking

The results appear to support Kang *et.al's* (2012) model of mobile banking use. As found in Kang *et.al's* (2012) model, perceived value was found to be an important determinant of sustained use. This is expected as both models are largely technology acceptance (TAM) based. TAM theory posits that perceived value is an important predictor of intention to consume a technology (Davis, 1989; Ajzen, 1991; Agarwal and Prasad, 1999; Venkatesh et al., 2003). Perceived value was also found to be the dominant contributor to use of mobile banking services in the post adoption phase. This is further supported by expectancy-value theory. This theory stipulates that users will continue to consume a medium as long as it generates positive evaluations (Eccles, Adler, Futterman, Goff, Kaczala, Meece et al., 1983).

The study model explained variance in sustained use to the magnitude of R^2 = .66. This variance is identified to be higher than both Kang *et.al's* (2012) and Wu and Wang's (2005) model. These models explained variance to the magnitude of R2 = .46 and R^2 = .48 respectively. This warrants the addition of the information quality, e-service quality and trust factors to sustained use.

The study also identifies that trust is a contributor towards the sustained use of mobile banking. This relationship is expected as users will continue to consume mobile banking applications provided that they are not exploited or placed at risk. (James, 2002; Beldad, De Jong and Steehouder, 2010). Although trust

was found to contribute to the sustained use, it was not the dominant factor. The relationship between perceived value and sustained use was three times the size of the relationship between trust and sustained use. This can be explained when taking into account the evolutionary trust perspective. This perspective posits that consumer trust will not remain at a static point, but will adapt over time as the person interacts with the environment (Jones and George, 1998; Van de Bunt, Wittek and Klepper, 2005; Karmakar and Roy, 2011; Tang, Liu, Gao and Das Sarmas, 2012).

Using the evolutionary perspective, it is suggested that online mobile banking users have evolved to such a point, that trust plays a minor part in mobile banking use. Users are therefore comfortable with the structural aspects of the mobile banking system and possess little doubt in security or risk concerns (Laukkanen and Lauronen, 2005; Laukkanen, 2007). This is supported by findings in Kyung and Prabhakar (2004), where it was identified that trust is not a sufficient condition for the adoption of online banking. A recent study also discovers that people utilise online banking channels when it suits their lifestyle and do not perceived it as riskier than other banking channel (Kalaiarasi and Srividya, 2012).

The study found information and system quality to indirectly influence the sustained use of mobile applications. This can be explained by the abundance of theory based on the DeLone and McLean model of information system success (DeLone and McLean, 1992). This model posits that system related attributes of the system will be positively associated with the use thereof. The model initially contained the system and information quality attributes, but the service quality construct was later added to their revised model (DeLone and McLean, 2003). It is therefore warranted that information quality and e-service characteristics of the mobile banking application would have an influence on whether consumers will continue to use it.

The study found no moderation effect for either trust or perceived value on sustained use. The absence of the moderation effect is posited to be caused by low technology anxiety levels exhibited by the sample (Mean = 17.31; Standard Deviation = 13.47). As the use of mobile banking services are relatively new

and purely voluntary. It is assumed to be predominantly adopted by technology savvy consumers. As described by Day and Montgomery (1999) these types of people have a high level of technical sophistication. They are able to understand and adopt complex technologies in a short period of time. Due to the high levels of enthusiasm and self-efficacy to use the new technology, this group of people possess low anxiety levels towards technology. (Macdonald and Uncles, 2007). It is therefore recommended that more studies by done to verify the moderation effect of technology anxiety.

5.3 Perceived Value

The study found information quality and e-service quality to be important determinants of perceived value. This is well supported in the literature and also identified to be important factors in the evaluation of a technology based system (DeLone and McLean, 1992, 2003; Boritz, 2005; Pearson et al., 2012). e-Service quality was found to contribute twice as much in comparison to information quality towards perceived value. It was also dominant over information quality in the overall indirect effect on sustained use (three times the magnitude of information quality). This is understandable due to the fact that consumers prefer mobile banking over other methods as they are convenient, easy to access (regardless of operating hours or vicinity), ensure privacy and require less effort (Laforet and Li, 2005; Laukkanen, 2007; Kim and Niehm, 2009; Akturan and Tezcan, 2012). It is therefore expected that the efficiency, fulfilment, system availability and privacy as defined by the e-service construct would be more valuable to a mobile banking user than the information quality aspect that defines the degree to which users receive relevant, understandable, reliable, adequate, precise and usable information.

5.4 Trust

e-Service quality is identified to be highly associated with Trust. The study finds that positive levels of e-service quality would be associated with higher levels of trust. This is expected, as the online trust paradigm stipulates that the lack of personal interaction would force the user to evaluate system related attributes.

(Shankar, Urban and Sultan, 2002). Examples of these attributes include efficiency, fulfilment, system availability and privacy as defined by the e-service construct. A positive evaluation of these attributes would therefore contribute to a higher level of consumer trust (Kim, Ferrin and Rao, 2003; Beldad et al., 2010).

Applying the online trust paradigm to the information quality aspect, it would be expected that the information quality would be positively associated with the level of trust. The study, however, provided no evidence of this relationship. This finding is contrary to the evidence found in online e-commerce studies where the information quality aspect is found to be positively associated with trust (Koehn, 2003; Liao, Palvia and Lin, 2006). Deviations in these results can be explained by vendor type. This is discussed in the next section.

e-Commerce vendors consists of a large number of companies across a myriad of industries (Kim, Song, Braynov and Rao, 2005). Mobile banking providers on the other hand are fewer in number and are strictly regulated. This enhances their reputation and increases consumers' propensity to trust. Consumers are therefore more likely to trust banking entities compared to traditional e-commerce vendors (Salam, Iyer, Palvia and Singh, 2005). This supported by Flavian, Guinaliu and Torres (2005) in their study of the corporate image and consumer trust.

Flavian *et al.* (2005) found that the positivity associated with the good corporate image of financial institutions was transferred to the online environment. This resulted in a positive association with consumer trust. It is therefore suggested that the same transference of credibility occurs to the information quality of mobile banking systems. As banks are renowned for producing high quality information in their traditional platforms, consumers therefore perceive this to be a given constant in the mobile platform (Ba, 2001). Users therefore remove the information quality construct from their system evaluation process. Focus is then placed on other factors such as those defined by the e-service quality construct i.e. efficiency, fulfilment, system availability and privacy. This is depicted in the study model.

5.5 Conclusion

The perceived value of a mobile banking application in the post adoption phase is suggested to be the predominant factor in influencing its sustained use. Trust is also identified to have a weak direct effect. The information quality and e-service quality aspects of the system are also identified to indirectly influence sustained use. Both quality constructs also contribute to the perceived value of the system. e-Service quality was found to be the dominant contributor to both perceived value and trust. No significant relationship was detected between information quality and trust. The next chapter discuss the implications of this study for future research and discusses some of the limitations.

CHAPTER 6: IMPLICATIONS AND RECOMMENDATION

6.1 Introduction

The previous chapter discussed the study findings in detail. This section provides a brief summary of the study. Implications for research and practice are then discussed. This chapter then concludes with recommendations for future studies.

6.2 Summary of the study

The study aimed to provide a deeper understanding of consumer usage characteristics and the factors that promote sustained use of mobile services in the post adoption phase. A model was derived from the literature and empirically tested through the use of structured equation modelling via path analysis. Data was collected from a final sample of 196 respondents using online surveys. The study found that both perceived value and trust are important antecedents of sustained mobile banking use. Information quality and e-service quality are identified as antecedents to perceived value and also to have an indirect effect on sustained use. Only e-service quality was identified to be a valid contributor to trust. No relationship was detected between information quality and trust. The next section discusses the implications of this study for research and practice.

6.3 Implications for Research

This research has many academic implications. It shows that perceived value is a dominant factor in the promotion of the sustained use of mobile banking services. Also that trust, information quality and e-service quality are important aspects in the evaluation of the system. It is therefore recommended that existing mobile banking literature be extended with these constructs in order to provide deeper insight into the consumer evaluation process (DeLone and McLean, 1992, 2003; Boritz, 2005; Kang et al., 2012; Pearson et al., 2012).

This study also provided deeper insight on consumer mobile banking use behaviour in the post adoption phase. This was required due to the limited number of studies in this area (Wu and Wang, 2005; Kang et al., 2012; Yu, 2012). The proposed model explained some of the variance in sustained use. It is therefore important for academics to advance this model in order to provide more insight into the sustained use of mobile banking.

6.4 Implications for Practice

From a practical perspective this research has many implications. For banking institutions, perceived value was identified to be the predominant contributor to the sustained use of mobile banking. Therefore banking service providers should therefore educate users on the value offered through mobile banking services including the promotion of information and e-service factors. This could potentially grow customer base and promote usage (Kang et al., 2012). This is important if they plan on developing a loyal customer base to receive a steady stream of profits and recuperate investment costs.

The study also indicated that trust is small contributor to the sustained use of mobile banking services. Banking institutions and mobile operators should try to build users trust in mobile banking platforms where possible in order to retain customers and increase system use (Beldad et al., 2010). Precautions should be taken however, as investments in the promotion of perceived value would have more impact due to its larger effect on sustained use. As indentified by Haas and Deseran (1981), enhancing trust not only involves the real world attributes of the firm e.g. market size and share, but also their online reputation, in the form of application performance and design.

e-Service quality is identified to positively influence perceived value, trust and increase the usage of mobile applications. Mobile banking application designers should therefore ensure that applications execute transactions quickly, are stable and protect the privacy of customers (Parasuraman et al., 2005). Similarly, as information quality has an influence on perceived value and sustained use, mobile applications should produce information that is relevant,

understandable, reliable, adequate, precise and usable (McKinney and Yoon, 2002).

From a managerial perspective, this research provides a model on which to predict the sustained usage of mobile banking and the factors that influence thereof. Managers can therefore manipulate these factors in order to attract and retain customers. This provides access to alternative market segments and increased penetration in existing markets. The principles of this study could be beneficial online providers in other areas. For instance, online shopping vendors could enhance their information and e-service capabilities. This could result in higher purchases or increased customer loyalty.

6.5 Recommendations

The study focuses on the characteristics and the factors that promote sustained use of mobile services in the post adoption phase. More research is required to validate the proposed model during other phases of the adoption lifecycle. Future research may consider the broadening of the model with the addition of more constructs to provide deeper insight into sustained usage. Factors such as system quality and user satisfaction could be added to the user evaluation process to examine their effect on use. The results of the study indicate no valid moderation effect for either trust or perceived value on sustained use. It is recommended that more research be perform in this area in order to validate this effect. This study also offers possibilities in other domains. Factors identified can be tested in other contexts such as online. This would provide valuable information to e-commerce vendors. Of particular interest would be the evaluation of the information quality construct and in lower consumer trust propensities.

6.6 Conclusion

This study provided a deeper understanding of consumer usage characteristics and the factors that promote sustained use of mobile services in the post adoption phase. As most studies occur in the pre-adoption phase, this is

considered to be a valuable contribution to the current body of knowledge. As discussed, study findings have valid research and practical implications. Recommendations have been put forward for further research to improve the understanding of mobile usage behaviours.

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APPENDIX A

A1. Letter to Respondents

Good Day,

My name is Bhavesh Desaraj and I am completing an MBA degree at the University of the Witwatersrand (WITS). My MBA thesis focuses on the factors that influence the use of mobile banking. In the task of collecting data on this subject, I would be extremely grateful if you could consider participation in a questionnaire pertaining to mobile banking. I understand that you are hard at work and pressed for time, your consideration to contribute to my research is highly appreciated.

Respondents are completely anonymous and confidentiality will be observed. The final report will be intended and used for academic purposes only. Questionnaire data will be destroyed when the academic requirements are met. Your participation is completely voluntary and involves no risk, penalty, or loss of benefits whether or not you participate. You may withdraw from the survey at any stage.

The survey consists of 63 statements and should take you approximately 15 minutes to complete.

Thank you for considering participating in the study. Should you have any questions, or should you wish to obtain a copy of the results of the survey, please contact me on my mobile number: 082 429 3010.

Please click on the link below to participate in the survey:

https://wits.eu.qualtrics.com/SE/?SID=SV_eg5MC4tBiz9Glip

Kind regards,

Bhavesh Desaraj

MBA Student: University of the Witwatersrand, Johannesburg

A2. Questionnaire Items and Dimensions

Sustained Use

SU1 I've been using mobile banking increasingly since I first used it.

SU2 I use mobile banking more than any other banking services (face-to-face banking, ATM, internet banking or telephone banking) these days

SU3 I have been using mobile banking continuously ever since I first used it.

SU4 Mobile banking has become a critical part of my banking activities

Perceived Value

PV1 Taking everything together, I consider mobile banking useful.

PV2 Mobile banking fell short of my expectations.

PV3 I do not intend to add mobile banking to my list of favourite applications

PV4 I intend to use mobile banking again.

PV5 Using mobile banking was a poor experience

Technology Anxiety

TA1 I am confident I can learn technology related skills

TA2 I have difficulty understanding most technological matters

TA3 I feel apprehensive about using technology

TA4 I am not able to keep up with technological advances

TA5 I have more self-confidence than most people

Trust

TR1 Mobile banking is trustworthy

TR2 Mobile banking keeps it promises

TR3 Mobile banking keeps customers' interests in mind

Efficiency

EF1 The mobile banking application makes it easy to find what I need.

EF2 It makes it easy to get anywhere on the application.

EF3 It enables me to complete a transaction quickly.

EF4 Information at this application is well organised.

EF5 It loads its pages / screens fast.

EF6 This application is simple to use.

EF7 This application enables me to get on to it quickly

EF8 This application is well organised

System Availability

SA1 This application is always available for banking.

SA2 This application launches and runs right away.

SA3 This application does not crash.

SA4 Screens / Pages at this application do not freeze after I enter my transaction information.

Fulfilment

FT1 The application conducts transactions when promised.

FT2 This application makes transactions available within a suitable time frame.

FT3 It quickly executes transactions that I submit.

FT4 It executes transactions that I submit.

FT5 It has the features the company claims to have.

FT6 It is truthful about its offerings.

FT7 It makes accurate promises about execution of transactions.

Privacy

PY1 It protects information about mobile banking behaviour.

PY2 It does not share my personal information with other applications.

PY3 This application protects my financial information

Relevance

IR1 Information that is applicable to your transaction decision is

IR2 Information that is related to your transaction decision is

IR3 Information that is pertinent to your transaction decision is

IR4 In general, information that is relevant to your transaction decision is

Understandability

IU1 Information that is clear in meaning is

IU2 Information that is easy to comprehend is

IU3 Information that is easy to read is

IU4 In general, information that is understandable for you in making a transaction decision is

Reliability

IR1 Information that is trustworthy is

IR2 Information that is accurate is

IR3 Information that is credible is

IR4 In general, information that is reliable for making your transaction decision is

Adequacy

IA1 Information that is sufficient for your transaction decision is

IA2 Information that is complete for your transaction decision is

IA3 Information that contains necessary topics for your transaction decision is

IA4 In general, information that is adequate for your transaction decision is

Scope

IS1 Information that covers a wide range is

IS2 Information that contains a wide variety of topics is

IS3 Information that contains a number of different subjects is

IS4 In general, information that covers a broad scope for your transaction decision is

Usefulness

IN1 Information that is informative to your transaction decision is

IN2 Information that is valuable to your transaction decision is

IN3 In general, information that is useful in your transaction decision is