A SURVEY OF CONSUMER ADOPTION OF MOBILE PHONE BANKING IN KENYA

BY

ONTUNYA P NDEGE

MANAGEMENT RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION (MBA) DEGREE, SCHOOL OF BUSINESS,

UNIVERSITY OF NAIROBI

NOVEMBER, 2006

DECLARATION.

This management Research Project is my original work and has not been presented for a degree in any other University

Signed.....**Date** 9/11/06

Ontunya P Ndege.

This research project has not been submitted for examination with my approval as the University Supervisor.

Signed.....**Date** 9/11/2006

Mr. Nixon Muganda

Lecturer, Department of Management Science.

School of Business, University of Nairobi

DEDICATION

This work is dedicated to family for the support they gave me through out my studies

ABSTRACT

The study aimed at shedding light on adoption Mobile phone banking a relatively new concept in the Kenyan banking sector The objectives of the study were to specifically establish what are the main factors affecting consumer adoption of mobile phone banking in Kenya. Secondly, based an adopted model from Fishbein and Ajzens model of theory of planned behaviour establish the extent to which intention affects adoption of Mobile phone banking in Kenya.

The findings of a sample of 67 respondents (32 respondents were users of mobile phone banking and 35 were non-users of mobile phone banking.) indicated that a number of factors are important for consumer adoption of mobile phone banking services. The factor included Keypad user friendliness, Cost of the service, security of the service, degree of service security cost of using the service, Importance of confidence, chance to try the service before use, amount of influence ease of use of the service, and importance of the support to use the service.

Confirmatory factor analysis established that attitude, subjective norm, perceived behavioural control and intention were among the most influencing factors of adoption of the mobile phone banking.

The first three factors attitude, subjective norm and perceived behavioural control had high factor loadings and the fact that they stem from intention (figure 2.7). This confirms that, the intention does influence adoption of mobile phone banking in Kenya to a great extent.

ACKNOWLEDGEMENTS

I thank all my lecturers for bringing me to this level of knowledge appreciation. To my classmates whose support was invaluable, receive my heart-felt appreciation.

Special thanks to my Supervisor Mr. Nixon Muganda for his unwaning support to see me through.

Finally, to my parents, my mother for being a pillar of hope, a true enabler. For me it has been a long walk, that began many years go when I got to pre primary

TABLE OF CONTENTS.

TABLE OF CONTENTS.

LIST OF TABLES

LIST OF FIGURES.

Page

CHAPTER 1 INTRODUCTION

1.1 Background

Mobile communication is progressing rapidly extending the range of possibilities that can be achieved through mobile telephony. Today the mobile phone is no longer just another communication tool between two parties. It is now being used in business applications especially with the introduction of 3G mobile phones which not only transmit voice and text messaging but also video messaging, video streaming, infotainment, multimedia messaging, location services, online banking and financial services, online shopping and internet browsing (Ziff, 2006). Mobile phones have come to represent a new era of secure electronic mobile commerce (Black et al , 2005).

According to Olga (2003), we can now conduct payment and banking transactions via our mobile phones. This is due to the electronic development that is emerging and advancing rapidly in all areas of financial intermediation and financial markets such as electronic-finance, electronic-money, electronic- banking, electronic-brokering, electronic-insurance, electronic-exchanges and even electronic-supervision. He further assets that this new technology is becoming an important factor in the future development of financial services industry i.e. influencing banks' marketing and business strategies. Banks are therefore faced with the challenge of taking full advantage of this new opportunity.

Perumal and Shanmugam (2004) contends that, the banking industry is an extremely information intensive industry and must remain at the forefront of advanced use of information technology. Banks are continually looking for alternative ways of relating to customers, reduce costs, improve efficiencies, and differentiate products and services. One trend in this line is the increasing use of self-service technologies like Automated Teller Machines, Internet Banking and Mobile phone banking.

The financial services industry has undergone phenomenal transformation. In just half a century, banking and customer's access to financial services has changed beyond the belief of traditional retail banks. It has changed from local branches, to branch networks, to ATM machines, to ATM inter-banks agreements, and to home banking software, to call centers, to telephone banking and to internet banking and Mobile phone banking is the most recent (Smith, 2001).

The carrying out of business transactions with your bank through the help of a mobile phone is now growing in various parts of the globe. For instance, this is more pronounced in the Nordic countries, India, Malaysia, UK and Japan among others, where mobile phone banking offer one a broad range of services like account transfers, fund and security trading, burger and plane ticket purchases. Financial consumers are becoming increasingly discerning and demanding when managing their finances. They expect anytime anyplace anywhere service (Black et al., 2005).

The way forward according to Qureshi (2003) for Nigerian banks are to take full advantage of technological solutions including ATM, Phone banking, home banking and Internet banking if they are to remain competitive. He stresses that banks must adopt Information technology or perish. It is for the same reason that Kenyan banks need to adopt this technology. Torres (2001) argues that its time to replace your leather wallet for a cell phone. Banking with a palm held device adds an exciting new dimension to Online Banking. One can enjoy all the ease, convenience, privacy and security of Online Banking through a handheld computer that fits neatly in ones purse or pocket. The Mobile Phone Banking service gives you account information and real-time transaction capabilities from the mobile phones at a true "anywhere, anytime, anyhow" convenience.

The rapid changes in the financial services environment, increased competition by new players from both banking and non-banking sector on product innovations, globalization and technological advancement, have led to a market situation where battle for customers is intense. Customers want access to all their financial services from anywhere at anytime regardless of who provides the service. Consequently, the linking of a portable device such as a mobile phone and a current account seems to be the way forward (Karjaluoto et al. 2002; Smith, 2001).

1.2 Statement of the Problem

Kenya's mobile phone banking market is at its infancy and not fully developed akin to many African countries that have adopted the service. Most banks have a service that can only be used for the information retrieval like querying the bank balances. For some the service includes credit top ups. Most of the existing studies in electronic banking services or electronic banking delivery of financial services have adopted an organizational perspective (Daniel 1999) or a distribution channel perspective (Black et al. 2005; Thornton and White 2001; Mohrs 2001) and they have largely been conducted in the context of Internet banking.

Locally, research has dwelt on Electronic Commerce i.e. its benefits and challenges to customers and businesses, for example Mbuvi's (2001) thesis on potential for adoption of e-commerce by tour operators in Nairobi and Merwe (2001) who concentrates on the technical and security aspects of Mobile Phone Banking. This leaves consumer adoption of mobile phone banking service in Kenya an unexplored territory.

The Mobile phone banking has business potential if it manages to reach the mass market. It is becoming the "bank branch" of the future and this is already evident in Europe where mobile phones are used to perform numerous banking tasks. Already a number of businesses are introducing mobile services covering the information, communication and transaction dimensions (Black et al. 2002). To facilitate this and allow other businesses to charge for their services, many banks are introducing mobile payments and mobile access to customer accounts (Kumar and Zahn, 2003).

Stakeholders need to understand the consumer adoption of mobile phone banking service and consequently explain the different adoption patterns in Kenya. Who adopt mobile phone banking? What are their reasons for adoption? These are important in developing promotional strategies, in evaluating alternative positioning for new products and defining market segments by highlighting consumer desires in mobile phone banking.

This research aims at filling the existing gaps by shedding light on consumer's adoption of mobile phone banking services and other characteristics that affect usage of mobile phone banking in Kenya. It focuses on attitude, intention and behaviour, how these affect consumers decision-making process leading to purchase and use or rejection of a given technology or product. The study attempts to answer the following questions.

1. What factors affect consumer adoption of Mobile phone banking service?
2. How does intention influence adoption of mobile phone banking service?

1.3 Research Objectives

1. To establish factors affecting customer adoption of mobile phone banking service in Kenya.
2. To establish the extent to which intention influences adoption of mobile phone banking service in Kenya.

1.4 Justification of the Study

The study was necessary because the mobile phone is seen as the "bank branch" of the future For example according to Thomas Burke, marketing manager ICL, "*Internet banking may well be the flavour of the month, but mobile phones are well on the way to completely transforming in which financial transactions are made in the years to come*" (The scottish Banker 1999 18) Therefore, it is crucial for banks and other stakeholders to understand consumers and their behaviour toward mobile phone banking service as much as possible to remain competitive in a constantly changing economic environment and consumer needs fueled by the rapid changes in technology Successful companies need precise knowledge of consumers, they need to understand what influences a consumer to adopt a given product or service The study provides an opportunity for stakeholder so understand what determines adoption of mobile Phone Banking Service.

1.5 Importance of the Study

i) To Managers of Bank and Service providers.

The study provides an understanding of customers' attitude towards Mobile phone banking service This will be useful to stakeholders (banks and service providers) who will in turn use it to solve bottlenecks to encourage Mobile phone banking in Kenya. This will enable them tailor their products to customer needs and make targeted marketing decisions for mobile phone banking

ii) To Academicians and Researchers

The research findings contribute new knowledge for theoretical consumer behaviour modeling by extending traditional theory to new application areas hence, giving new insights into the theory. The study contributes to both theory and practice. Lastly, since mobile phone banking is a comparatively new field of academic research, the study aims at increasing the understanding of current consumer behaviour patterns on electronic services or technology.

CHAPTER 2 LITERATURE REVIEW

2.0 Chapter Overview

This chapter explains Azjen and Fishbein's model of TRA (theory of reasoned action) (1980), which is the basis for this study. It also highlights TPB (theory of planned behaviour) and Technology Acceptance Model (TAM) as derivatives of TRA model. It briefly explores the Kenyan banking environment and traces the development of mobile phone globally over the years its benefits, limitations and its future. It also explores how Banking has evolved from a branch-based service through use of the ATM's (bank in the hole) to the present where multiple channels are used to provide this service.

It highlights the Importance of attitudes as one of the important psychological determinants of consumer behaviour, among the complex interplay of cultural, social, personal and psychological factors, in addition to the marketing mix tools or 4 P's, i.e. Price, Product, Promotion, and Place. It relates consumers' attitudes to the consumption of goods and services.

2.1 Overview of the Banking Sector in Kenya

Kenya's banking history goes back to 1896 when the National Bank of India opened a branch in this East African country. The banking system in Kenya consists of 49 commercial banks, four building societies, two mortgage finance companies and three non-bank financial institutions. Seventy three percent of all banking business is handled by 12% of the Kenyan banks. This comprises of twelve major banks (East African discusses road ahead for Kenyan banks, 2005).

Competition is stiff among banks in the Kenya. Some banks are even open seven days a week in an effort to attract more clients. They are aggressively pursuing growth in personal loan products and credit card accounts or non-secured loans. Kenya's banking industry still has a way to go, salaries and wages are often very high because there are no IT systems as each branch has its own infrastructure. New legislation, a new IT infrastructure and new strategic directions will strongly contribute towards growth of banking in Kenya. Most banks have achieved branchless banking through the ATM networks in Kenya although there is about one ATM for every 100 000 people (East African discusses road ahead for Kenyan banks, 2005).

2.2 History of Mobile Phone Development

Since electromagnetic waves were first discovered as a communications medium at the end of the 19th century, they have undergone tremendous evolution. The first systems offering mobile telephone service were introduced in the early 1950s. Early single cell systems were severely constrained by restricted mobility, low capacity, limited service, and poor speech quality. The equipment was heavy, bulky, expensive and susceptible to interference. Because of those limitations, less than one million subscribers were registered worldwide by the early 1980s (Mobile phone Communications, 2003).

The First Generation (1G) cellular systems were Analog Cellular. The introduction of these cellular systems in the late 1970s and early 1980s represented a quantum leap in mobile communication (especially in capacity and mobility). Semiconductor technology made microprocessors smaller, lighter weight and sophisticated mobile systems a practical reality for many more users. The 1st Generation cellular systems still transmit only analog voice information. Then came the Second Generation (2G) cellular: systems were Multiple Digital Systems developed because of the need to improve transmission quality, system capacity, and coverage. Further advances in semiconductor technology and microwave devices brought digital transmission to mobile communications, which is used for speech transmission. Speech transmission still dominates the airwaves, but the demands for fax, short message, and data transmissions are growing rapidly. Supplementary services such as fraud prevention and encrypting of user data have become standard features that are comparable to those in fixed networks.

Finally the 3G, in 1990 the Phase 1 of the 3rd Generation of cellular networks was rolled out and in particular GSM900. It included all necessary definitions for the GSM network operations. Several tele-services and bearer services have been defined (including data transmission up to 9.6 kbps), however only basic supplementary services were offered. Presently, the main characteristics of 3G systems, collectively referred to as International Mobile Communications-2000 (IMT-2000), a single family of compatible standards by International Telecommunications Union that have the following characteristics: they can be used worldwide for all intelligent mobile applications that support both packet-switched (PS) and circuit-switched (CS) data transmission. They offer high data rates of up to 2 Mbps (depending on mobility or velocity) and higher spectrum efficiency (Mobile phone Communications, 2003).

2.3 Global view of the Mobile Phone Banking

Since the first Mobile phone was released, about twenty years ago, people of all walks of life (age and gender; business or personal) are using them. Mobile phones now play an integral part in business, and the technology is regarded as an important business tool. Due to the enhanced development in mobile communications, mobile phones now have a lot to offer, ranging from talk to Internet access, and soon to video (Mobile phone communications, 2003).

Since 1990's the penetration of mobile phone in the developed economies has been explosive. In 1997, only 215 million people were using mobile communications devices worldwide, by 2001 the number had grown to a massive 961 million and further to 1.16 billion by 2003. Europe exhibits the highest penetration of mobile phones (79%), followed by North America (48%) and Asia (12%)(Bauer et al, 2005). Northern European countries are the most advanced in the adoption and use of different new mobile and technological appliances and have extended the implementation of technological advancement into banking services (Finland Statistics, 2002).

Mattila and Pento (2002) contend that in Finland, payments and account management products over mobile GSM phones as SMS service have been available over one decade, exactly since 1992, television-based banking since 1998 and banking via mobile Internet WAP since 1999. They further state that Finnish customers conduct their routine banking mainly via Internet, over 70 % of the customers visit a branch office less than twice a year. This is presently changing with the expected improvements in 2.5G and 3G devices and networks will encourage the uptake of mobile phone banking (Mattila, et al, 2002).

According to Smith (2001) Mobile phone banking Systems over the recent years has changed pace beyond the belief of traditional retail banks and that in just half a century, we have gone from local branches, to branch networks, to ATM machines, to ATM inter bank agreements, to home banking software, to call centers, to telephone banking and to internet banking and now Mobile phone banking is the most recent. Mobile phones can either have an application on the smart card inside the phone allowing customers access to banking services or, phones can have a browser to access services from a Mobile phone banking system.

Torres (2001) argues that although there is low response for the mobile phone banking there is confidence that the market would adopt mobile phone banking just like it did seven years ago when text messaging was introduced. Many other banks in Asia, Europe, and Oceania

have introduced this form of banking for example In china, The China Construction Bank CCB (China Construction Bank reports brisk e-banking business, 2004) and In 2002, Telekom Malaysia, TM cellular, and Bumiputra-Commerce Ban (BCB) launched a Mobile Banking Service (Moggie, 2002).

2.3.1 Mobile phone banking in Africa

There is phenomenal expansion of mobile phone networks in Africa. This provides an opportunity to operate virtual bank accounts through mobile phones, either through menu-driven systems or through SMS (short message service, or text messaging) technology which is already being used by millions (Cracknel, 2004)

M-banking is gaining momentum throughout the continent and Fundamo has already provided solutions and supporting services to providers in South Africa, Kenya, Botswana, Zimbabwe, Zambia and the DRC. (M-Banking in Africa – showing signs of growth, 1999).

According to a poll in South Africa, "Cell phone banking the way to go", it established that almost half of around 2000 people with bank accounts polled during a mobility research project view cell phone banking as safe and almost two thirds regard it as convenient. This suggested that cell phone banking would be a powerful growth area in the coming years The World Wide Worx's research on current and future shape of mobile technologies in Stanton, South Africa, established that 87% of respondents had a bank account and of these 13% had tried cell phone banking. Almost two thirds of those who have tried it had only done so to request a balance. These were established from a national representative sample of 2400 telephonic interviews over a three-month period in South Africa (Cellphone banking, 2005)

Torres (2001) argues that, cell phone banking is the way forward because electronic business has not had the predicted growth expected for South Africa because computer-based e-business is simply not viable. This is because the majority of the populations do not have access to computers, therefore banks must offer an alternative e-medium, and the alternative is to consider offering customers interactive communication via cell phone In Kenya the mobile phone banking services adoption patterns are not clear like in say South Africa where according to Torres (2001) it is evident that Cell phone banking, has the potential to spread swiftly to the mass South African market soon as it becomes as easy to do a banking transaction via cell phone, as it is to make a call The cell , hone is becoming ubiquitous this is because it is wireless, ever available, easy to use and the infrastructure is in place. It is

already penetrating the rural community. As a result, this is seen as the logical progression to interacting with the emerging bank market among the rural communities. Several local banks have already introduced banking by cell phone, currently used by mostly young people.

In Zambia Celpay a deployment owned by First National Bank, a mobile payment facilitator operating in Zambia and the Democratic Republic of Congo (DRC). It offers mobile phone-based virtual bank accounts with advanced features, which compare to many normal bank accounts. Account transfers, bill payments, cash deposits, withdrawals, and prepaid airtime vending are all supported with real-time clearing. Celpay has also developed m-banking business services like cash-on-delivery payment functionality and companies like BP, MultiChoice and various cafes, supermarkets, pharmacies, and even hair salons an O'Hagan's in Zambia use the system (M-Banking in Africa – showing signs of growth, 1999).

2.3.2 Mobile phone banking in Kenya

Kenya's mobile phone market has witnessed phenomenal growth rates since the second GSM operator launched in 2000. The number of mobile subscribers exceeded three million during 2004 with one of the two networks breaking through the two million barrier. Driving growth is the widespread availability of prepaid packages. However an enormous potential remains, since mobile phone penetration is currently at around 10% only. In Kenya six banks offer limited Mobile phone banking as they provide information services and a few do offer cell phone payment services. Refer to Appendix 5

The Cooperative bank of Kenya Limited offers Mobile phone banking which offers information services like balance enquiry, mini- statement, automatic advices to clients on credits and airtime purchase as the only payment service. On the other hand the National Industrial Credit Bank (NIC) offers Access banking, which is mainly an information service product, it includes internal funds transfer and Third party transfers within the same bank, similarly, the National Bank of Kenya offers 'SIM-ple' banking service. They utilize the cell phone to query the balances and other informational services, but no payment services at all.

The Consolidated bank of Kenya offers 'CELL BANKING' where a customer can make Bank balance request Mini-statement request Monthly statement, request cheque book request, Stop payment and issue fixed deposit instructions as an easy way to access account information and give certain instructions to the bank through mobile phones. It is a 24-hour, convenient to use, saves on time and paper work and is real-time at competitive cost, in fact

one only covers message transmission cost. Meanwhile Credit Finance Corporation Bank hopes to launch revolutionary retail banking products that target Kenyans who use mobile phones. According to the bank's CEO, opening new branches will not characterize the bank's retail strategy but products tailor-made for over six million mobile phone users (Mbogo, 2006). Although some banks have adopted the mobile phone banking service, it is not known who the adopters are and why they adopt the service. This is important for the banks and service providers in Kenya for marketing and improvement of the service.

2.4 Profiles of Mobile Phone Bankers

Research has shown that the largest proportions of e-banking users will be aged between 16 to 24 years. The users tend to be richer, younger and above all better educated (Mattila et al. 2002). According to a research conducted in Finland, a user of mobile banking belonged most often to age group 25 to 34 years old. The majority of the so-called regular users (43.6 %) were 25 to 34 years old as well as majority (36.8 %) of occasional users, whereas non-users were relatively older compared to the two other groups. Every third of non-users (31.7%) belonged to age group 35 to 49 years old and 25.9 % to 50 to 64 years old. About one third (38.9 %) of the respondents were married. Majority of the all respondents were workers (40.1%), the second biggest occupation group was white-collar workers (19.6 %) and third students (10.5 %). The result is compatible with the result of background education of the respondents, which was in most cases (25.2 %) secondary level vocational school.

These results differ from the earlier finding of electronic (Internet) banking users, who have traditionally had university level education and higher professions. Majority of the respondents (19.1 %) belonged to household income category of 20,001-30,000 euros per year, which matches with the average year income of two persons in Finland (Jayawardhena et al. 2000).

Mattila and Pento (2002) conclude that typical user of mobile phone banking service is male, 25 to 34 years old, married, has secondary level education and average income. Most customers (88%), who are not using mobile banking, did have a fixed-line Internet connection in their use compared to the mobile banking heavy users, of which every fifth (19.3%) did not have a fixed-line Internet connection on use. One might assume that the lack of fixed-line Internet connection is one of the major drivers of mobile banking adoption.

2.5 Benefits of Mobile Phone Banking

The Mobile phone introduced a new channel for banks to reach customers. This is because Bank branches are becoming increasingly expensive to operate and customers are increasingly demanding by wanting to do business when it is most convenient for them. For those on the move, between rushed appointments, it's a service available to the hurried entrepreneur. Mobile phone banking comes in as a part of the bank's initiative to offer multiple channel banking and convenience for its customers (M-Banking in Africa - showing signs of growth, 1999).

Mobile phone banking systems have the ability to communicate with customers on all wireless networks, wherever they are and whatever time of day with the help of wireless applications. These wireless applications include enable financial institutions to wirelessly offer account services, provide account information, execute transactions, provide transaction history, and offer billing and payment services from virtually any mobile, or web-enabled platforms to their customers. For instance, one can use his mobile device to purchase tickets for events, public transport pay for parking, and download content information over the Internet (E- banking snapshot, 2002)

2.6 The problem areas and challenges of Mobile phone banking

Apart from the fact, that in Mobile phone banking one lacks the important feature cash access, security and privacy, seem to be the main problem. The lack of standard security protocol, insufficient bandwidths compounded by the fact that 3G mobile phones are expensive is affecting adoption of the mobile phone banking service (Mattila et al 2002) Mobile phones with blue tooth functions built-in are exposed to the prospect of being 'hacked'. The location awareness feature of mobile phones is similar, but not exactly the same, as Global Positioning System where a mobile phone user can be located wherever on the globe has also raised issues on breach of security and privacy. In Australia many argue for the need for tighter laws concerning cameras in mobile phones, others hold the opinion that people that should be blamed - not the technology (Mobile Phones - Security and Privacy, 2004, E banking snapshot, 2002).

The insolicited SMS messages, otherwise known as SMS Spam also raise questions on the subject of privacy. Some mobile users have been irritated after opening a SMS message only to find promotional messages. Consumer groups view it as a breach of consumers' rights by

not having the option to accept reception such messages (Mobile Phones - Security and Privacy, 2004, Mobile-phone banking expands into rural Philippines, 2006)

Secondly, the biggest overall problem of mobile phone banking lies on the technological side. The limited screen size poses the greatest challenge to usability i.e. using the mobile phones numeric keypad to input text. An effective Mobile phone user interface (MUI) is critical for successful mobile phone applications. However, to build effective MUI's firms could face challenges in terms of display resolution, display size and data interconnection method among others (Mobile Device UI Design, 2006; Suld, 2002). The low number of customers using mobile phone banking is largely due to the technical limitations. In addition to low bandwidth, long transmission times, no always-on connection and high costs resulting from unstable connections are frustrating GSM-based WAP users. These constraints will disappear, with the introduction of GPRS and later UMTS (Mohammad, et al. 2004; Fan et al. 2004).

According to Ziff, (2006) the seriousness of the usability issue was highlighted by a survey carried out by Wacom Components in November 2004. According to the survey, 85% of consumers admitted to being 'too dumb' to access or use mobile services, mainly because of increased device complexity. Nearly three quarters of those questioned felt that handsets had become too difficult to navigate around. The research revealed that although 78% of consumers now own handsets through which they can access data centric mobile services such as games, ring tones and information services, only a third of consumers are using them. 36% of respondents were not using them, as they were too complex to access and operate, with only 10% citing cost factors for lack of use and only 6% lack of interest in the type of mobile services that are currently available. If handset manufacturers were to simplify mobile phone usability, 55% of consumers felt that they would be encouraged to use more mobile services and nearly a third would increase their usage with further reductions in pricing and special offers.

Thirdly, the legal framework on security issue is another stumbling block to the fast push of Mobile phone banking in Philippines. The Bangko Sentral ng Pilipinas (BSP), the country's Central Bank's regulatory law prevents banks from engaging in any agreements that may endanger its security by opening its database to suppliers from an outside source (Torres, 2001, Mobile-phone banking expands into rural Philippines, 2006).

Fourthly, there is a likelihood of Mobile phone Infrastructure requirements (and not WAP) will be outpaced by demand mobile phone services including banking, implying that as M-

commerce increases it will put increasing demands on existing technology infrastructure as it encourages higher m-commerce volumes. Therefore, the infrastructure needs to gear up for unexpected volumes. This can have significant impact on these data services since most of these systems are simply inadequate for big volumes. So there is a possibility of unsatisfactory performances observed by mobile data users (Wireless Application Protocol, 2006)

Fifthly, as with many other technologies what matters most and what guides the development of a technology is the emergence of "killer applications" or cutting edge application. Unless some killer applications hit the market, to influence the mood of the end user, WAP just like other technologies has a difficult path ahead (Wireless Application Protocol, 2006).

Finally, according Lomes (2001) the most challenging part has been convincing Banks to take up this service; Banks have the ATM, phone-banking and Internet-banking services already. They felt the market was not ready for this new technology. They don't believe they can move all the functions of an ATM to a cellular phone (Leung, 2002).

2.7 Future of mobile phone banking

There are incentives in place to adopt mobile phones as new technologies overcome their previous limitations. Mobile phones will become personal controllers for anything humans meet. They will control the TV set and other electronic equipment. They will let you into the subway system, act as corporate identity, replace money when shopping, turn on your car and interact with anything else humans deal with. Banks may not just be banks any more they may not be able to stay in just financial services only. They will sell insurance, loans and help you manage your share portfolio. New products mean extra systems to store customer accounts or to help customer care agents, querying information for you. M-payments will take up the 20% of the bankcards payments and about 50% of the share for the next 2-3 years (Suld, 2002). According to Mori, (2002) in the United Kingdom one in five adults say they would be interested in making payments from their mobile phone using SMS text messaging in the next 2 years. This indicates that mobile phone banking has a potential in the future

2.8 Relationship between Attitudes, Beliefs and Intentions

Rommers (1954) defined attitude as an effectively toned idea or group of ideas predisposing the organism to action with reference to specific attitude objects'. Baron and Byrne (1984) define attitude as "relatively lasting clusters of feelings, beliefs, and behavioural tendencies

directed toward specific persons, ideas, objects or groups" According to Foxall (1980), attitudes and behaviour affect each other. Past behaviour does influence attitudes; consequently, the relationship between attitude and behaviour is usually represented as a two-way process in which attitude affects behaviour and vice versa (figure2.1). If a person has a positive attitude toward mobile phone banking, he or she is more likely to adopt a mobile phone banking or influence other people For the purpose of this study attitude refers to " an overall perception about an object"

Figure 2.1 Relationship between attitude and behaviour

In consumer decision-making process, attitudes are important These are unfavorable or favourable evaluations by consumers of the ability of products or services to meet their needs. Thee negative or positive evaluative feelings or action tendencies that are learned and clung to are critical to business success. They must be capitalized or changed for customers appreciate marketer products or services, thus attitudes are the most measured aspect of consumer behaviour.

Katz and Scotland (1959), Krech et al (1962) and Fishbein (1965) claim that attitude has three components (1) cognitive component, (2) affective component, and (3) action tendency component (figure 2 and figure 3). The cognitive component refers to the knowledge or beliefs a person has about the object (e.g *mobile phone banking is faster than traditional banking*") i.e., it concerns *knowing* and *believing*. The affective (evaluative) component represents the consumers' overall feelings (denoting liking/disliking) regarding the object and *evaluation* of the brand (for instance *"I like mobile phone banking"*). The affective component is also called brand evaluation. Overall product evaluation or service evaluation by consumers can be measured by rating it from poor to excellent or from least preferred to most preferred. Elements of this component are commonly, referred to by bi-polar adjectives such as the love-hate, like and dislike, admire-detest, and others usually connoting feelings of favorable or unfavorable.

The final component of attitude, the action tendency component (also called behavioural component), reflects behavioural tendencies toward the attitude object. It incorporates the behavioural readiness of the individual to respond to the object in a particular way. The behavioural component can be measured in terms of intention to buy or behave in a positive

way. There is a linkage between cognitive components particularly evaluative beliefs and the readiness to respond to the object. Furthermore, there is the general notion that evaluative beliefs and the direction of the response readiness will tend to be consistent. For instance, if an individual believes that his society is good, and stands for good goals and practices, he will probably be in a state of readiness to respond to it in a helpful, supportive and participatory manner (Remmers, 1970). It is from such notions that this study of the consumers' behaviour towards mobile phone bankers has not only become important but indispensable too for banks.

Attitudes eventually lead to intentions. In general, intention is viewed as being related to the corresponding behaviour and Intentions are a function of certain beliefs. Relevant beliefs are concerned with a given behaviour, and that some of these beliefs influence ones attitude toward behaviour. Attitude toward performing a given behaviour is related to beliefs that performing the behaviour will lead to certain consequences and to ones evaluation of those consequences. This type of attitude is viewed as a major determinant of the person's intention to perform the behaviour. Other beliefs relevant to a behavioural intention are beliefs of a normative nature, which means that other people affect a person's behaviour (Fishbein and Ajzen, 1975). According to Howard's Buyer-behaviour Model (1963), a complete picture of individual's beliefs and attitudes toward various aspects or objects of his "world" do yield reliable predictions of his behaviour in various situations. He cites that, an attitude is an enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspects of an individual's world; and that attitudes are active rather than neutral; and that they are stronger than beliefs, with their importance relative to the extent to which they motivate behaviour. Attitudes directly affect purchase decisions and these; in turn directly, affect attitudes through experience in using the products or service selected. In a broad sense, consumption or purchase decisions are almost solely, upon attitudes existing at the time of purchase.

2.9 Measurement of Beliefs and Attitude

Attitudes are one type of cognitive structures, which are identified by inference from verbal responses. Attitudes are not open to direct observation but their existence and their strength are inferred from what is observable (Remmers, 1954). What we observe are patterns of verbal responses in relation to particular people, objects, or classes of people and objects. Traditionally self-reported beliefs, feelings and intentions to act with respect to an object have been used as the primary basis of inference. According to Howard (1963) an attitude

may be operationally defined as a set of consistent verbal-responses with respect to some specified antecedent, where response consistency implies that the manifest items (e g words, phrases, positions on a "scale", etc; that are used to assess the attitude "add up" or make sense rather than contradict each other. According to Reminers (1954), there are various assumptions made in measuring attitudes. They include; attitudes are measurable, they are held by many people and that they vary along a linear continuum. The other assumption proposed by Assael (1981) is that attitudes are related to behaviour. The more a consumer favors a brand the greater the likelihood he or she will purchase it, or attitudes are measures of inclinations to purchase (or consume) a good or service.

To measure attitudes, beliefs and intentions, the likert scale (Likert, 1932), the semantic differential (Osgood, Suci and Tannenbaum 1957) and accuracy scale is used.

A) Brand Beliefs

How likely is it that Brand A has the following characteristics?

Brand A is a highly carbonated Cola

Improbable——————————————————————— *Probable*

B) Overall Evaluation

Rate Brand A as follows.

Very Favourable---------- *Very Unfavourable*

C). Intention to buy

What is the likelihood that you will next buy this brand A?

Definitely will buy ---------- *Definitely will not buy.*

2.10 Theory of Reasoned Action (TRA) by Azjen and Fishbein (1980)

TRA has been used in various behavioural science disciplines and Information systems in order to predict and understand consumer behaviour. It has been used to study behaviour and attitudes toward computer privacy issues (Loch and Conger 1996), to examine user acceptance of computer technology (Davis et al. 1989) and to predict intention to learn to use a PC (Yeaman 1988). Its success in similar research disciplines is the basis for its use as background for the present study. TRA applies to voluntary behaviour (Ajzen, 1975; Hartwick and Barki 1994).

Figure 2.2 Basic form of TRA

The theory proposes that behaviour is affected by behavioural intentions that, in turn, are affected by attitudes toward the act and by subjective norm. The first component, attitude toward the act (personal factor) is a function of the perceived consequences people associate

with the behaviour. The second component, subjective norm (social factor) is a function of beliefs about the expectations of important referent others, and ones motivation to comply with the referents.

This theory is based on two assumptions: (1) people consider the implications of their actions before they decide to engage or not engage in a certain behaviour, and (2) a person's intention to perform or not perform a certain behaviour is the immediate determinant of the action. According to the TRA, a person's intention is based on two basic factors: a personal factor and a social factor. The personal factor, referred to as attitudes toward the behaviour, represents the individual's negative or positive evaluation of performing the behaviour. The social factor, referred to as the subjective norm, is the person's perception of the social pressures placed on him or her to perform or not to perform the behaviour.

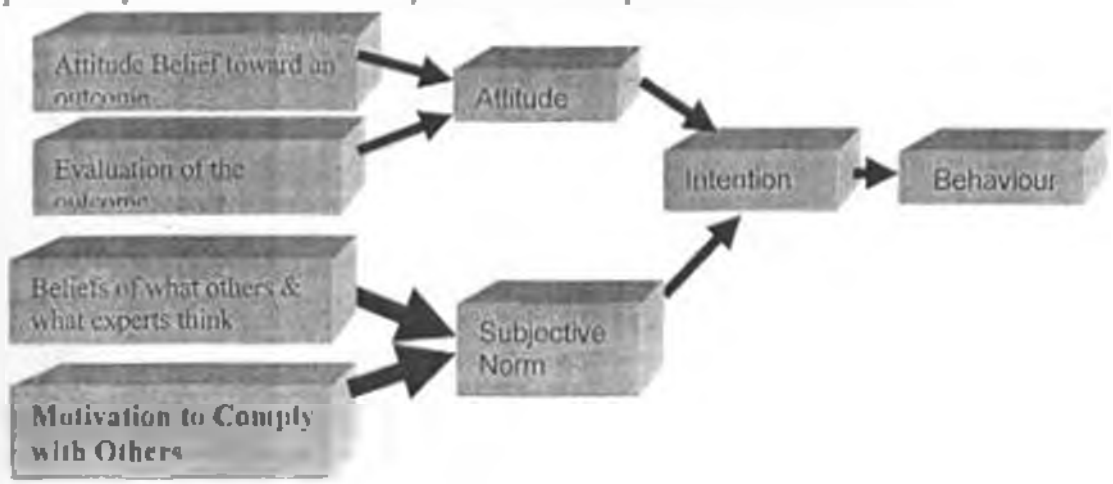


Figure 2.3 A complex form, of the Theory of Reasoned Action model

Subjective norm is a person's perception of what others around them believe the individual should do. For instance, in a typical purchasing situation in a department store, a consumer may think about what his family or friends, community leaders and even celebrities would think about such product. Whether or not a person engages or intends to engage in any behaviour is influenced strongly by the people around them. Ultimately, one's attitude toward behaviour can lead to an intention to act (or not to act as the case may be). This intention may or may not lead to a particular behaviour (Ajzen, 1975; Hartwick and Barki 1994). The theory assumes that consumers consciously consider the consequences of the alternative behaviours and choose the one that leads to the most desirable consequences. The outcome of this selection process is an intention to engage in the selected behaviour. According to Runyon and Stewart (1987), the TRA takes into account all the factors influencing a consumer rather than isolating one single component of or use when predicting behaviour.

Theory of Reasoned Action can be presented as follows (Figure 2.4 below)

$B \sim BI \sim (A_B)\ W_1 + (SN_B)\ W_2$

A_B = consumer's attitude toward performing behaviour B, SN = subjective norm regarding whether other people want the consumer to engage in that behaviour, and W_1 *and* W_2 = empirically determined weights that reflect the relative influence of the A_B and SN and components on BI

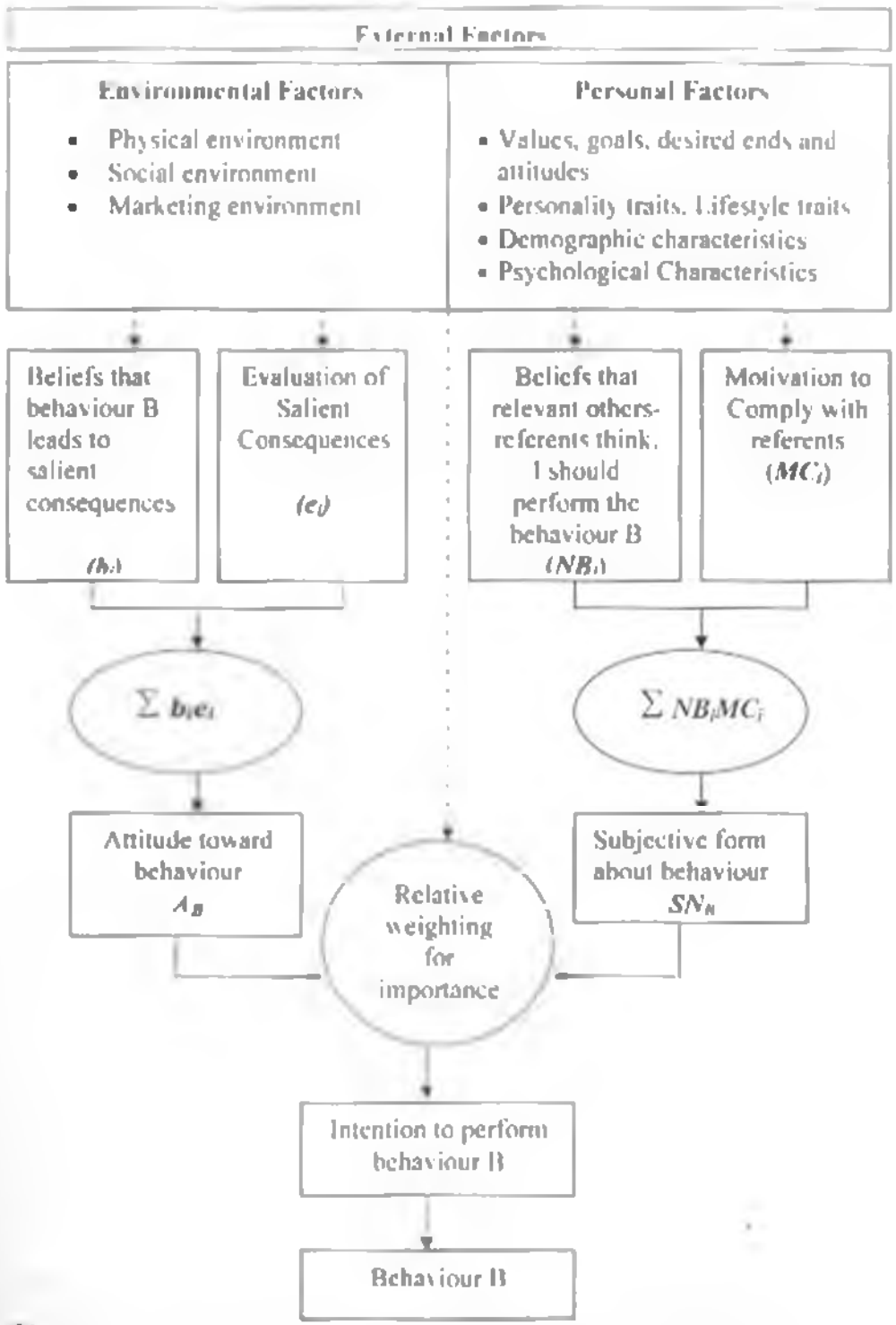


Figure 2.4: Theory of Reasoned action Source: adapted from Fishbein 1980: 301

2.10.1 Components of the theory of reasoned action

The Theory of Reasoned Action consists of two major factors: a personal or *attitudinal* factor, A_B, and a social or *normative* factor, *SN*, which are given empirical weights. The attitudinal factor, A_B refers to the consumer's attitude toward performing the behaviour in question under given circumstances a symbolically represented as

$$A = \sum b_i e_i$$

Since a consumer's attitude toward a specific behaviour is said to be a

> *function of the perceived consequences of performing that behaviour and the person's evaluation of those consequences* (Fishbein and Ajzen 1975, 301)

The normative component, *SN*, deals with the influence of the social environment on behaviour. The normative component reflects consumers' perceptions of what the important other people expect them to do, i.e. the subjective norm is determined by the perceived expectations of specific referent individuals or groups, and by the person's motivation to comply with those expectations. Fishbein and Ajzen (1975, 302) represent subjective or social norm symbolically as follows:

$$SN = \sum b_i m_i$$

Where b_i is the normative belief, regarding *doing what other people want me to do*, and m_i is the motivation to comply with different i, and n is the number of relevant referents. Assessing the strength of normative beliefs (b_i) is similar to the belief-strength measures. Fishbein and Ajzen (1991) states that measures of normative belief strength (b_i) and motivation to comply (m_i) "*with respect to each accessible referent offer a 'snap shot' of perceived normative pressures in a given population*." The model proposes that attitude (A_B) and subjective norm (*SN*) combine to affect behavioural intentions (*BI*), and that their relative influence varies from situation to situation. The component *B* is specific behaviour in a target situation. In general, behaviours are specific actions directed at a target object. Researchers must be aware of the behaviour of interest, because the components of the Theory of Reasoned Action must be defined and measured in terms of these specific features. Behavioural intentions are created through the consumer decision-making process, in which beliefs about two types of consequences, *AB* and *SN*, are integrated to evaluate alternative behaviours and select among them. Behavioural intentions are the likelihood of doing something, like purchasing. That is, intention is a type of judgment about how, in the present context, an individual will behave toward a particular service offered. They can be measured by asking consumers to rate the probability that they will perform the behaviour of interest:

According to Ajzen (1991) proposition several intention items should be used to assess behavioural intentions, and that the set of items used must have significant correlation with each other to ensure high internal consistency to predict consumer behaviour and understanding attitudes the TRA identifies factors that motivate consumers' intentions to perform a specific behaviour. TRA focuses on intentions rather than attitudes as the most important predictors of overt behaviour.

In summary according to TRA, a consumer's intention to perform any behaviour is determined by the attitude toward performing the behaviour (A_B) and by the subjective norm (SN).

2.10.2 Modifications of Theory of Reasoned Action

A major weakness of TRA is the relationship between behavioural intention and overt behaviour i.e. behavioural intention and behaviour are not always closely related. In the TRA, the intention of an individual can be used to accurately predict a person's behaviour in three conditions. Firstly, intention and behaviour measures correspond in specificity of action, target, context, and time frame. Secondly, intention and behaviour do not change in the interval between the assessment of intention and the assessment of behaviour. Finally, when the behaviour in question is under the individual's volitional control, i.e. a person can decide whether to perform or not perform the behaviour. If these three conditions do not exist, the prediction of behaviour will be poor (Fishbein and Ajzen 1975; Godin and Kok 1996). If these conditions are met, the TRA will have considerable validity. Fishbein and Ajzen (1975,) have claimed that other variables not explicitly included in the TRA (e.g. demographic variables, attitudes toward the target object, and personality traits) can affect intention and behaviour only if they influence the relevant attitudinal or normative considerations or their relative weights. Furthermore, other studies have found that an individual's prior experience has an effect on intention but not directly on future behaviour. Based on these criticisms of TRA Fishbein and Ajzen, added a third component to the theory: the concept of perceived behavioural control (PCB) to come up with TCB.

2.10.2.1 Theory of Planned Behaviour (TPB)

According to Ajzen (1991) and Madden (1986) the Theory of Planned Behaviour (TPB), behavioural beliefs, normative beliefs and controlling beliefs guide behaviour. These then lead respectively to *attitude toward the object* (*A*), *subjective norm* (*SN*), and *perceived*

behavioural control (PBC). In combination, the three factors then lead to the formation of a behavioural intention. PCB refers to a person's

> *"beliefs about the presence of factors that may facilitate or impede performance of the behaviour and the perceived power of these factors"* (Ajzen, 1991)

The TPB asserts that behaviour (B) is a direct function of behavioural intention (*BI*) and perceived behavioural control (*PBC*') and that behavioural intention is formed by ones attitude (*A*), this reflects feelings of favorableness or unfavourableness towards performing a behaviour, subjective norm (SN) which reflects perceptions that significant referents desire an individual to do or not to do a behaviour; and perceived behavioural control (PBC'), which rejects perceptions of internal and external constraints on behaviour (Ajzen, 1991). Behaviour therefore is a weighted function of intention and perceived behavioural control; and intention is the weighted sum of the attitude, subjective norm and behavioural control components.

Thus, according to the TPB model:

$$B = w_1 BI + w_2 PBC$$

$$BI = w_3 A + w_4 SN + w_5 PBC'$$

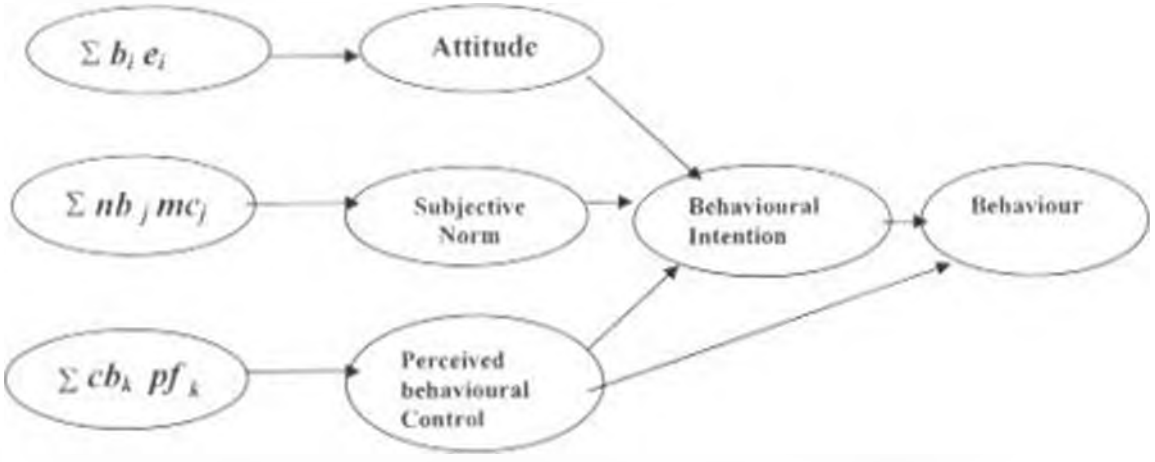


Figure 2.5: Theory of planned Behaviour (Taylor and Todd, 1995: 146)

According to Ajzen (1975), each of the determinants of intention, i.e., attitude, subjective norm and perceived behavioural control, is in turn, determined by underlying belief structures. These are referred to as attitudinal beliefs, behavioural beliefs (b_i), normative beliefs (nb_j) and control beliefs (cb_k) that are related to attitude, subjective norm and perceived behavioural control respectively. Stated formally, attitude (A) is equated with the attitudinal belief (b_i) that performing a given behaviour will lead to a particular outcome, weighted by an evaluation of the desirability of that outcome (e_i), that is,

$A = \Sigma\, b_i e_i$

For example, an individual may belief that using information technology will lead to better performance (b_i) and may consider this a highly desirable outcome (e_i).

Subjective norm is formed as the individuals normative belief nb_i concerning a particular referent weighted by the motivation to comply with that referent mc_i i.e.

$$SN = \Sigma\, nb_i\, mc_i$$

For example, an individual may believe that his/her peers think that he should use information technology (nb_i) but complying with the wishes of his peers is relatively unimportant (mc_i)

According to Ajzen and Driver (1992) perceived behavioural control reflects beliefs regarding access to the resources and opportunities needed to perform a behaviour, or alternatively, to the internal and external factors that may impede performance of the behaviour. The notion of perceived behavioural control encompasses two components. The first component is facilitating conditions (Triandis 1979), which affects the availability of resources needs to engage in the behaviour, such as time, money or other specialized resources. The second component self-efficacy; that is, an individual's confidence in his/her ability to perform the behaviour (Bandura, 1982). Perceived behavioural control is formed as the sum of the control beliefs (cb_i) weighted by the perceived facilitation (pf_i) of the control brief in either inhibiting or facilitating the behaviour, that is.

$$\mathrm{PBC} = \Sigma\, cb_i\, \mathrm{pf}_i$$

For example, an individual may feel that he/she does not have the skill to use information technology (cb_i) and that skill level is important in determining usage (pf_i). Using a direct test Mathieson (1991) found that PBC did have a significant relationship with behavioural intention, however it did not provide substantial explanatory power. Moore and Benbasat (1993) found that perceived voluntariness, which is likened to perceived behavioural control, was a significant determinant of a given behaviour

2.10.2.2 Technology Acceptance Model

The technology acceptance model (figure 7) is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in the literature (Bagozzi et al., 1992; Davis et al., 1989). The Technology Acceptance Model (TAM) is an information systems theory

that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology or new product, a number of factors influence their decision about how and when they will use it, notably: Perceived usefulness (PU), defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" and Perceived ease-of-use (EOU) ,defined as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989).

TAM replaces many of TRA's attitude measures with the two technology acceptance measures – *ease of use*, and *usefulness*. both TRA and TAM have strong behavioural elements, they assume that when someone forms an intention to act, they will be free to act without limitation. In the real world there will be many constraints, such as limited ability, time constraints, environmental or organisational limits, or unconscious habits which will limit the freedom to act (Bagozzi et al., 1992).Bagozzi Davis and Warshaw say

"Because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using." (Bagozzi et al 1992 191)

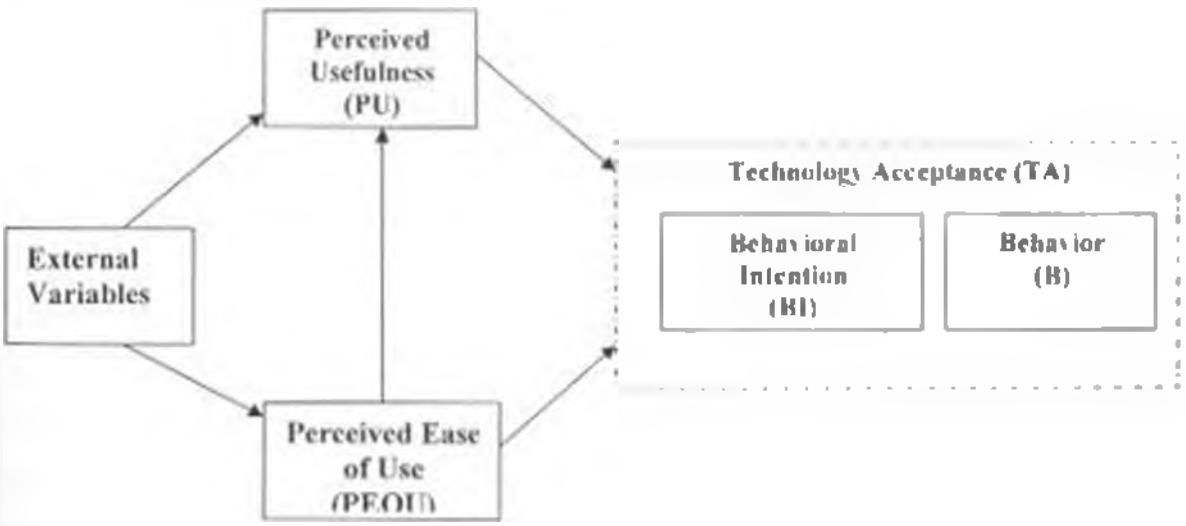


Figure 2.6: Technology Acceptance Model (Taylor and Todd, 1995: 146)

TAM posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use (adoption). Perceived usefulness is also seen as being directly impacted by perceived ease of

use. Researchers have simplified TAM by removing the attitude construct found in TRA from the current specification (Venkatesh et al., 2003). Several researchers have replicated Davis's original study (Davis, 1989) to provide empirical evidence on the relationships that exist between usefulness, ease of use and system use (Adams, Nelson and Todd, 1992; Davis et al., 1989).

Rogers (1995) proposed in his general theory of diffusion of innovations that there are five characteristics relevant to the adoption decisions, relative advantage, complexity, trialability, comparability, and observability. Concept of perceived risk is often included as augmented by Bauer (1960) particularly in banking services. This is because the perceived risk associated with the financial product itself as well as with electronic delivery channel is higher than in basic consumer goods, and hence increasing the importance of this attribute of innovation. According to Harrison, (2000) ensuring security and confidentiality are the fundamental prerequisites before any banking can take place because it involves sensitive information. Relative advantage, compatibility, trialability and observability are positively related to adoption of an innovation and the remaining two, complexity and perceived risk, negatively related (Jayawardhena and Foley, 2000). According to Mattila and Pento, (2002) on Factors affecting the adoption of Mobile Banking Services, the most significant predictors of adoption in this case turned out to be relative advantage gained, compatibility of services with adopters existing values and perceived complexity of the services.

The newly emerged mobile banking services represent an innovation where both intangible service and an innovative medium of service delivery employing high technology are present. Thus, concepts of innovation and diffusion of innovation are even more intricate as technology and service aspects have an effect on the characteristics of mobile banking services (Mohr, 2001). Traditionally, research relating to the customer adoption of innovation concentrated on socio-demographic and psychographic attributes of potential adopters. These kind of personal characteristics of a consumer have been found to be predictors of adoption (Al-Ashban and Burney 2001). Other research, however, has demonstrated that it is the perceived attributes of innovation itself rather than the personal characteristics that are the stronger predictors of the adoption decision (Black et al. 2001).

Whether they are perceived attributes of innovation or psychographic attributes of potential adopters, they are both components of attitude. These innovation or psychographic attributes have influence on attitude and consequently, adoption patterns of mobile banking services.

2.11. The Model applied to adoption of mobile phone banking service (Figure 2.7)

2.11.1 Attitude towards behaviour

This refers to as learned predispositions to respond to an object or class of objects in a consistently favorable or unfavorable. These predispositions to some "object" they are outcomes of psychological processes and are no directly observable but must be inferred from what people do or say. (Assael, 1981). According to TRA, our attitudes toward a particular behaviour are influenced by a combination of two related factors: our beliefs about the *outcome* of the behaviour (i.e., is the outcome likely or unlikely?) and our *evaluation* of the potential outcome (is the outcome a good thing or a bad thing?)

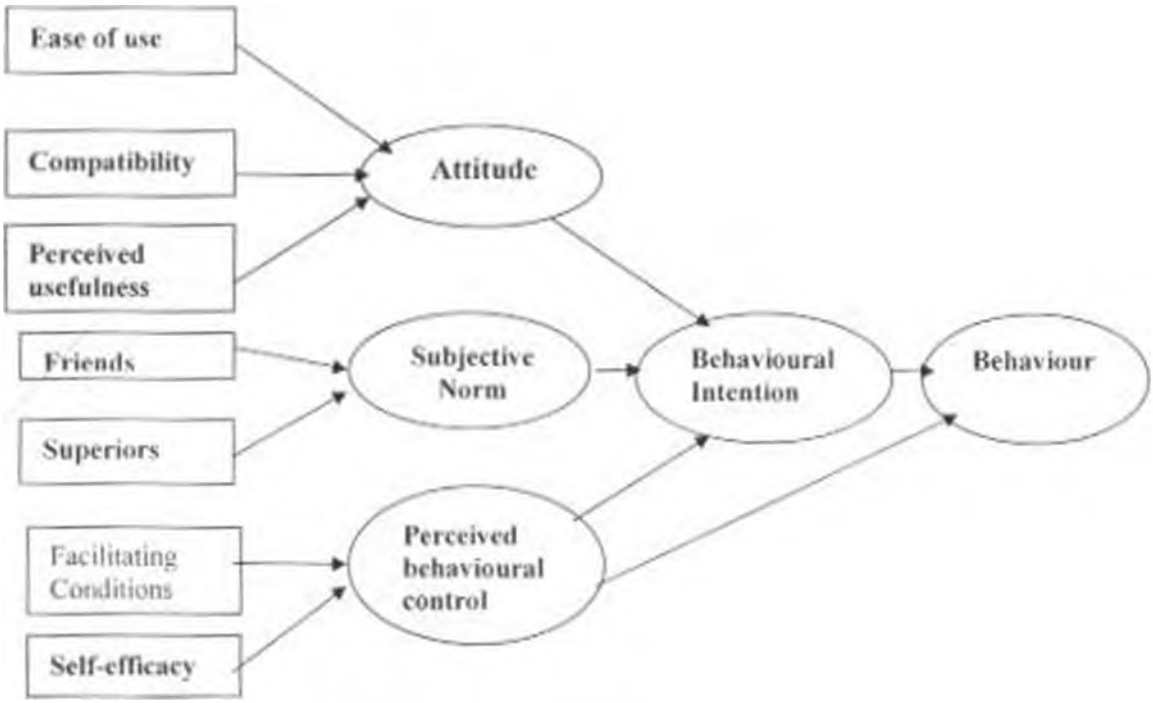


Figure 2. 7: Research Model.

2.11.2 Subjective Norm

Subjective Norm creates social pressure that influencing people (consumers) to act in a given manner in order to conform to the expectations referents people important to them (significant others). Significant others or reference groups, who will construct this virtual boundary influence one to do or not to do will vary often will normally include family members and friends

> *"Subjective norm is the perceived social pressure to engage or not to engage in behaviour. Subjective norm is determined by the total set of accessible normative beliefs concerning the expectations of important referents." (Ajzen, 1995)*

2.11.3 Perceived Behavioural Control

Perceived behavioural control reflects beliefs regarding access to the resources and opportunities needed to perform a given behaviour, and the internal and external factors that may impede performance of the behaviour. It has two components. The first component is facilitating conditions (Triandis 1979), which affects the availability of resources needs to engage in the behaviour, such as time, money or other specialized resources. The second component self-efficacy, that is, an individual's confidence in his/her ability to perform the behaviour.

> *"Behavioural control refers to people's perceptions of their ability to perform a given behaviour. It is assumed that perceived behavioural control is determined by the total set of accessible control beliefs, i.e., beliefs about the presence of factors that may facilitate or impede performance of the behaviour" (Ajzen, 1995).*

2.11.3 .1 Facilitating conditions

They refer to an attitudinal stimulus but within the physical limitations and in the case of mobile phone banking service the attitude towards mobile phone banking may be limited by lack of knowledge or the fact that the service has a cost premium, which others choose to avoid or health reasons. Like in any other technology, product or service the adoption rate is determined by the facilitating conditions. Facilitating conditions for instance include cost, service availability, amount awareness, level of support, security and service compatibility (Pedersen et al, 2002a).

For this study the facilitating conditions are extremely important especially the following measures;

a) The cost of the service: The cost of carrying out a mobile phone transaction over ones mobile phone can be expensive especially considering the various economic statues in the country. Cost is a huge factor prohibiting the adoption of other services like WAP, SMS and GPRS. This in turn limits the adoption rates of mobile phone banking services, which often have an extra cost premium of the service.

b) Availability of the service: Availability refers to the availability of mobile phone banking services and supporting services. I·g. The availability of handsets with WAP, GPRS i.e. phones with appropriate platform technologies to support mobile phone banking services.

c) Ability to make a Choice: This refers to the ability of one being in a position to make a decision to adopt a given behaviour or not.

2.11.3 .2 Confidence in using the service

This refers to the ability of one feeling in control while using the mobile phone banking, referred in the literature as self-efficacy. In their research, Compeau and Higgins (1991b) have shown that self-efficacy has a significant effect on a given behaviour.

> *"Self-efficacy (related to adoption) is an individual's self-confidence in that adoption will lead to the desired behaviour" (Pedersen et al. 2002a)*

2.11.4 Perceived Usefulness

Perceived usefulness is defined as how well consumers believe a service can help them perform their daily activities (Davis, 1989). Other constructs have identical meaning, including relative advantage, extrinsic motivation, and job fit of perceived consequences. The similarity between these constructs has been verified in (Venkatesh, et al., 2003; Thompson et al, 1991). Previous studies suggest a positive relationship between perceived usefulness and user acceptance. When this belief increases, consumers' intention to use a service will increase correspondingly

2.11.5 Perceived Ease of use

To predict the elements involved in the adoption of technology services, Bagozzi et al., (1992) included the Perceived Ease of Use as an important measure. Perceived ease of use refers to the extent to which a user believes that using the service will be free of effort (Davis, 1989). Complexity was also introduced in the literature to measure the degree to which a service is perceived as relatively difficult to understand and use. The complexity construct is just the opposite of the perceived ease of use construct (Thompson et al., 1991). A service perceived to be less difficult to use could attract more users to adopt it. Consequently, a positive relationship is expected between perceive ease of use and user acceptance

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the overall methodology used in the study. It includes research design, population of study, the sample and sampling method, a description of the data collection method and data analysis approach used

3.2 Research Design

The methodological approach for this study was descriptive. This is because Mobile phone banking is a relatively a new area of academic research. The study will identify attitudinal positions of consumers towards mobile phone banking services and compare the attitude variation between gender, age group, and incomes.

3.3 Population of Study

The population of interest in this study is bank account holders in the country's 47 banks both private and public. Refer appendix 6.

3.4 Sampling and Sampling Procedure

The study involved primary a sample of all account holders of the 47 banks in country. The sample was obtained in Nairobi city and therefore comprised of the city dwellers because of time and resource limitation. The sample was divided into two, users and non-users of mobile phone banking.

The six banks offering mobile phone banking services were targeted. Convenience sampling was used to select a sample of other banks that do not offer mobile phone banking services. The basis was proximity, accessibility and time available for the study (appendix 5). On selecting a sample of the banks and branches, Snowball sampling was used to obtain both users and non-users of mobile phone banking services. This is because as preliminary research has indicated that only bank staff that are account holders would be available to fill the questionnaires and they will then refer me to their colleagues who will fill the questionnaires.

The account holders were grouped into the following categories.

1. Banks that offer mobile phone banking services.
   - Customers who do not use mobile phone banking
   - Customers who use mobile phone banking.

2. Banks that do not offer mobile phone banking services

- Customers who do not use mobile phone banking

3.5 Data Collection

Primary data was collected using a self-administered questionnaire with structured and semi structured questions by the bank account holders. The five-point likert scale is used in the questionnaire where answering the questionnaire will help determine the attitudes.

The questionnaire is divided into two main sections, one targeting the users and the second section targeting non-Users of mobile phone banking. Section A for both questionnaires will collect general demographic information. While section. B will collect data in the various factors in the Model. Refer figure 2.7

3.6 Data Analysis

The data collected was screened for completeness, consistency and accuracy and arranged to enable coding and tabulation before final analysis. The data was presented in tables, cross tabulations, mean scores, Charts, frequency tables, percentages and proportions of two categories of the respondents, i.e. Users and Non users of Mobile phone banking service. Inferences were used to determine if the findings could be generalized. It was used to explain the Mobile phone banking phenomenon in Kenya and establish the relationships with variables.

Factor analysis was used to uncover relationships amongst several variables. The variables are the degree of agreement with various specific perception and belief statements while the factors are the general underlying constructs. The factor analysis for this research was conducted using a statistical package SPSS v11.5.

CHAPTER 4 DATA ANALYSIS, PRESENTATION AND FINDINGS

4.1 Introduction

This section presents the data collected by questionnaires filled by the respondents i e the Mobile phone banking users and non-users It provides the profiles of respondents and for the data collect both descriptive statistics and inferential statistics is applied.

4.2 Demographic information of respondents

4.2.1 Response Rate

The total number of questionnaires distributed was 100. Out of these only 67 respondents filled their questionnaires. This represented 67 % percent of all the questionnaires issued Users of mobile phone banking comprised of 48 %percent while non-users were 52%percent

Figure 4.1 Distribution of the respondents according to gender

The sample comprised 67 respondents This included 41 respondents who were men and 26 Female respondents respectively. This was 61% Male and 31% percent Female.

Figure 4.2 Distribution of respondents according to users, non-users and their Gender

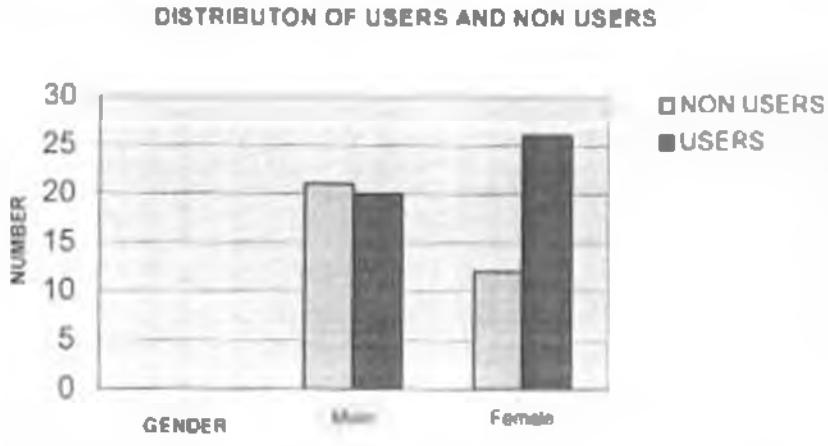
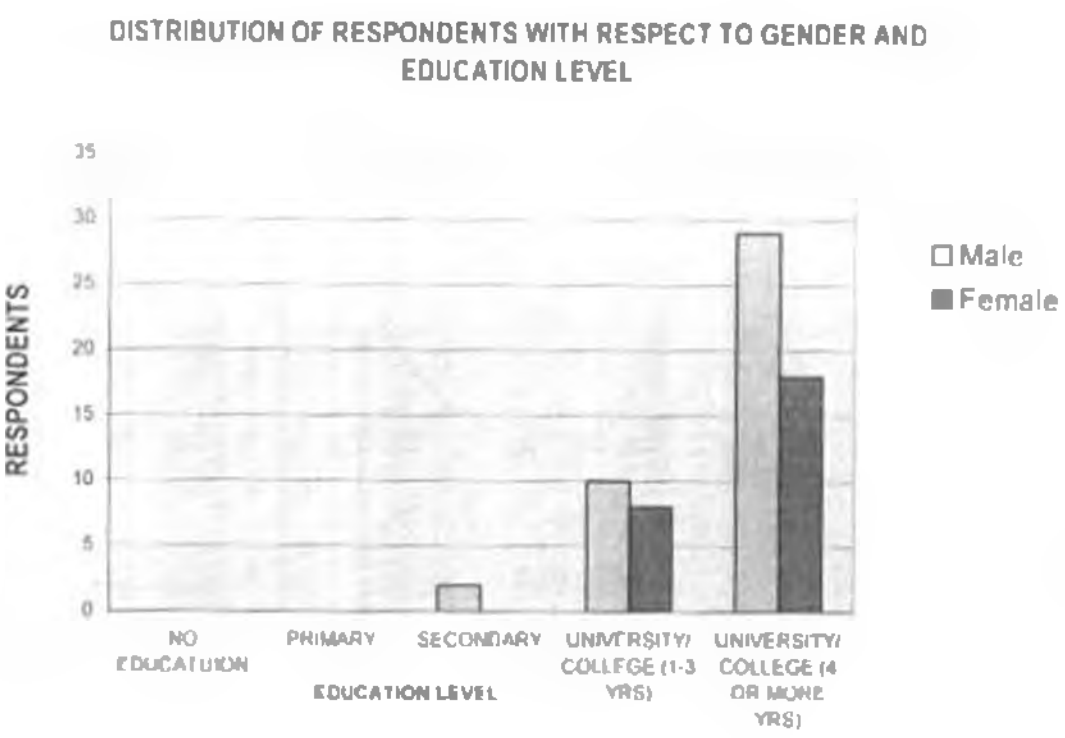


Chart indicates the there more women in the sample and most of these were non-users of mobile phone banking

Figure 4.3 Distribution of the respondents' gender and their education level



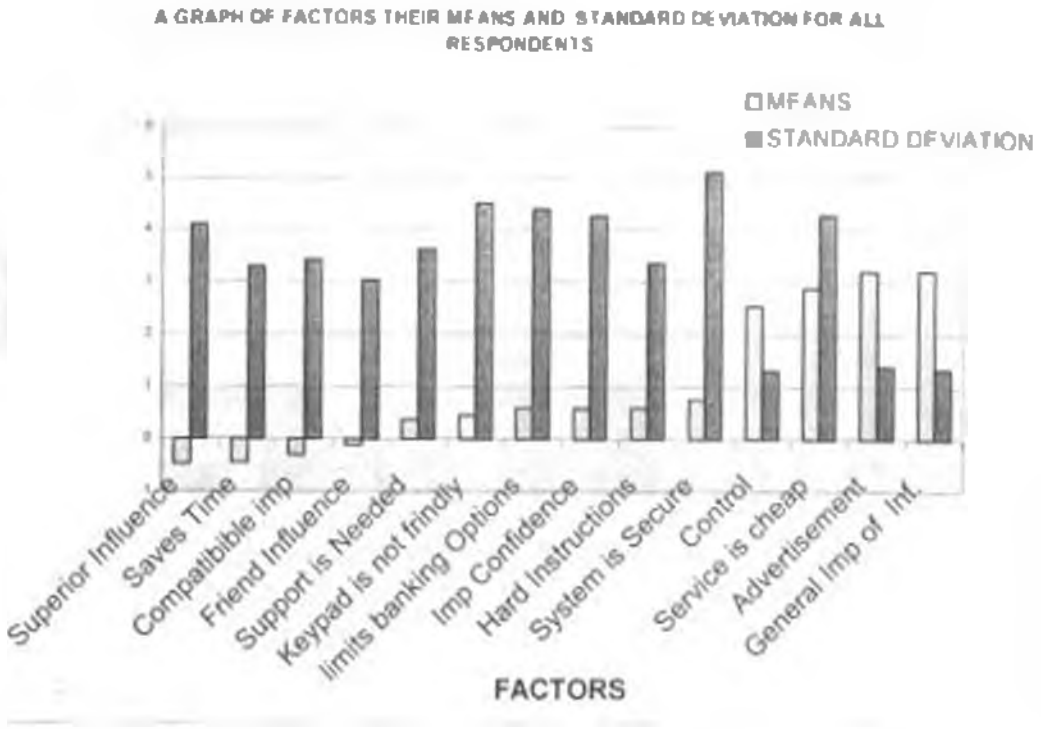
In two of these categories, there was no tally i e namely respondents with no education at all and those with only primary education out of the total sample. Most of the respondents had either been to college or university The proportion of respondents with university education of over 3 years were the largest proportion it comprised of 70 % percent, those with college or university education of 1- 3 years comprised of 27 % percent and those with only secondary education had 3 % percent

Table 4.1 Distribution of respondents according to their age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-29	14	20.9	20.9	20.9
	30-39	42	62.7	62.7	83.6
	40-49	11	16.4	16.4	100.0
	Total	67	100.0	100.0	

Approximately 84 percent of the respondents were between the ages of 18 to 39 years Of these, the 21% percent were between the age 18 and 29, while 63 % percent between 30 to 39 years. This is because people in this age group typically have more time to complete

Figure 4.8 A Bar Graph of mean and standard deviation of the various factors for all respondents



4.4 INFERENTIAL STATISTICS

4.4.1 Confirmatory Factor Analysis

In order to test the research model, Confirmatory factor analysis is applied. According to the research model figure 2.7, which is based on TPB model by Ajzen (1980), mobile phone banking adoption considered multidimensional. The research model like the theory of TPB is a directional model and at one end of the model is Behaviour, which is which can be indicated by behavioural intention. Behaviour intention is influenced by Attitude (A), Perceived behavioural control (PBC) and subjective norm (SN). Various studies show that while these are the main components they can be modified

The scores of factors below ranged from –10 to +10. This is obtained as a product of components of the variables in the model e.g. for Attitude (A) is a product of a given behaviour and the evaluations $A = \sum b_i e_i$ refer to the figure 2.5. A negative value refers degree of disagreement of the importance or need for a given factor, the positive value however, refers to a degree of agreement and neutral refers not a state of nether agreement or disagreement

4.4.2 Confirmatory factor analysis of determinants of mobile phone banking adoption

In the Table 4.11 below the principal axis factoring extracted factors with the objective of determining factors that influence adoption of mobile banking. The principal axis factoring output in the table extracted five factors. The sums of squared loadings are left out as the variables have been assumed to correlate. Whenever variables and factors correlate the sums of squared loadings in the table cannot be added to obtain the total variance.

Table 4.12 SPSS factor analysis generation of the Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings (a)
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.022	23.659	23.659	4.022	23.659	23.659	3.750
2	3.242	19.069	42.728	3.242	19.069	42.728	3.055
3	2.183	12.840	55.568	2.183	12.840	55.568	2.279
4	1.686	9.918	65.486	1.686	9.918	65.486	1.951
5	1.211	7.126	72.612	1.211	7.126	72.612	1.924
6	.948	5.574	78.186				
7	.886	5.213	83.399				
8	.797	4.689	88.088				
9	.601	3.535	91.623				
10	.531	3.124	94.747				
11	.382	2.245	96.993				
12	.188	1.109	98.101				
13	.129	.757	98.858				
14	.111	.652	99.510				
15	.037	.219	99.730				
16	.027	.159	99.888				
17	.019	.112	100.000				

Extraction Method: Principal Component Analysis.

a When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

The extraction method used was principal axis factoring with oblimin rotation. The "Total" column gives the amount of variance in the observed variables accounted for by each component or factor. The first five components account for 72.612 percent of the variance. This is indicated in the "% of Variance" column, which gives the percent of variance accounted for, by each specific factor or component, relative to the total variance in all the variables. The proportion of the components' variation to the total variation that is involved in the correlated factors is found on the communalities table (appendix 2)

Table 4.13 Pattern Matrix (a)

	Component				
	1	2	3	4	5
Keypad. User friendliness	.564				
Friend Influence					.489
Imp of Support			.737		
Easy Instructions	.787				
Cheapness		.613	.453		
System is Secure			.795		
Saves time		.976			
Superior Influence					.546
Limits banking options	.825				
Compatible		-.960			
Importance of Confidence				-.488	
Intention				.741	
Imp Trial			.803		
General Imp Influence					
Advertisement	.875				
Attitude				-.697	
Control.	.953				

Extraction Method. Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.
a Rotation converged in 11 iterations.

According to Rummel, 1970 the pattern matrix (table 4.12) only can be used interpretation He says that the pattern matrix found using oblique rotation is more interpretable than the orthogonal rotation solutions with fewer variables loadings significantly on more than one factor. Oblique normalization was preferred due to the assumption of correlation among variables. Absolute values below 0.485 was applied in the table were suppression to reduce the factors into few significant ones.

The oblique rotation using oblimin in the pattern matrix indicates significantly loaded factors include:

Factor 1 It can be named **attitude** This factor was significantly loaded by the following factors.:

Keypad user friendliness: The variable emphasized that the decision to adopt mobile phone banking is influenced by mobile phone user interface (mobile phone keypad) the factor has a weight of 0.564.

- **Easy instructions**: this factor cites the need for mobile phone banking instruction or navigation on ones mobile phone to be easy to apply. This influence on the decision to adopt this service. Its weight was 0.787

- **Limits banking options**. The use of Mobile phone banking should not limit ones banking options to be popular with users. The decision to adopt the use of mobile phone banking is also influenced by whether it will limit ones banking options. Its weighting was 0.825.

- **Advertisement**: the level of awareness of a given product or service, and its use does affect ones decision to use, adopt or reject. It had a weight of .875

- **Control**: This refers to the ability of one being in a position to make a decision whether to use the service or not it influences ones decision to use or not use the mobile phone banking. It had a weight of .953

Factor 2: This factor can be named perceived behavior control and had the following significant loadings.

- **Cheapness** (low cost): the decision to adopt mobile phone banking is determined by he cost of using the service. The factor had a weighting of 0.613

- **Save time** (Usefulness): the usefulness of a mobile phone banking does determine adoption. It had loading of 0.979.

- **Compatibility**: mobile phone banking should be compatible to the users lifestyle for user to feel comfortable to use it. This affects adoption ads well. It had loading of 0.960.

Factor 3. This factor can be named **triability** it had substantial factor loadings of:

- **Level of support**: this influences greatly the adoption of mobile phone banking. It had a loading of .737

- **Security**: the level of security as well does effects the adoption of mobile phone banking. This is especially because it involves money. It's weighting of. .795

- **Triability**: because of the risk involved and to develop confidence on needs to try the use of mobile phone baking before adopting it. This had a weighting of 0.803

Factor 4. This factor can be named as **intention**. It had other factors with substantial factor loadings of:

- **Importance of confidence:** User confidence is important fro adopters of mobile phone banking. The weight of this factor is .488. Whatever that can improve on the user confidence is important because it influences adoption of the service.
- **Intention:** the intention of wanting to use or not to use the mobile phone is very important as well in the determining the adoption of mobile phone banking. It had a loading of .741.
- **Attitude:** ones perception about a given product does greatly affect ones decision to adopt or not. It had a weighting of .697.

Factor 5: This factor had significant loadings it can be referred to as **subjective norm**.

- **Friend influence:** this external influence from friends does affect adoption of mobile phone banking. Its weighting was 0.489.
- **Superior influence:** this external influence from friends does affect adoption of mobile phone banking. Its weighting was 0.546.

These factors explain all the constructs found in Ajzens' TPB model, which is modified and used for this study-illustrated figure 2.7 (the research model).

the mobile phone user interface for the mobile phone would improve, as it is key to usability i.e. keypad user friendliness. They need support occasionally. This means getting necessary support to enable them carry out the their transactions with their phones.

For non-users, they want to be sure it will work, therefore want to try using the service before they can adopt it. Confidence is very valuable in the use of this service and if anything can be done to boost their confidence. There was significant lack of awareness of the service. Banks and providers of the service should market it thoroughly while highlighting its benefits. There were respondents who are have accounts in bank that offers the service but they are not ware that the service exists. For non-users they are worried more about cost and whether it is secure to use the system. They need the service to be affordable.

For both categories of the respondents, there was correlation on what they consider important for the service (appendix 3).

Objective 2:The extent to which intention influences adoption of mobile phone banking service

Confirmatory factor analysis (CFA) was applied to reduce the number of factors and establish the most significant ones affecting mobile phone banking adoption as proposed by Ajzen's model. CFA established that the factors of the model were significant in determining mobile phone banking adoption. They include, attitude, perceived behavioral control, intention and subjective norm, and since the model is a multidimensional model with multiple factors hinged on intention, then it is intention that to a great extent influences adoption of mobile phone banking, in Kenya. The findings of the study are that intention influences behavior and thus adoption of a given service or product. In addition some variables in the research model are more important than others in determining the adoption or rejection a of a given service or product.

5.3 Suggestions for further research

The study should be done with a larger sample, and with the aim of getting the banks perspective of the service and not the clients only. This will also explain the slow pace of development, and even advertising of the product. Are they getting complaints are more customers interested in using the service, and what is the trend. A comparative study of various countries can be done since research shows that the factors that influence adoption of a service do vary from country to country.

5.4 Limitations for the study

Like many studies, the study had its own limitations.

a) **Data collection**

This was a major draw hurdle as the respondents are not willing to give available information. The sampling method used was snow ball, where I was referred to users of mobile phone banking by their friends or colleagues. I got a lot of difficulty when I was seeing someone who does not know me the bank.

The sampling method used has a high degree of bias and can hardly be used for generalizations.

Data from the users of the service was mainly from the staff of the banks that offer the services. This again created bias on the kind of data that was available. Most banks were did not want me give their client a questionnaire.

b) **Lack of finances**

Due to limited finances and time constraints for the study. The study design was as such affected for instance the data collection technique and sample size that was used.

References

Adams, D. A., Nelson, R. R., and Todd, P. A. 1992. 'Perceived usefulness, ease of use, and usage of information technology: A replication'. *MIS Quarterly*, 16, 227-247.

Agarwal, R. and Prasad, J., 2000, 'A field study of the adoption of software process innovations by information system professionals'. *IEEE Transaction on Engineering Management* Vol 47, No 3, pp.295-308

Ajzen, I. and Fishbein, M. 1980. *Understanding Attitudes and Predicting Behaviour*. Englewood Cliffs, NJ: Prentice Hall

Ajzen, I., 1991. 'The theory of planned behaviour' *Organizational Behaviour and Human Decision Processes*', 50, 179-211

Ajzen, I. and Driver, B. L., 1992, 'Applications of the theory of planned behaviour to leisure choice' *Journal of Leisure Research*, 24, 207- 224.

Ajzen, I. and Fishbein, M., 1980, *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice-Hall

Ajzen, I. and Madden, T. J., 1986, 'Prediction of goal-directed behaviour: Attitudes, intentions, and perceived behavioural control'. *Journal of Experimental Social Psychology*, 22, 453-474

Al-Ashban, A. A. and Burney, M. A. 2001, 'Customer adoption of tele-banking technology: the case of Saudi Arabia'. *International Journal of Bank Marketing*. Vol 19 (5), pp 191-200.

Anckar, B and D'Incau, D. 2002, 'Value creation in mobile commerce: Findings from a Consumer survey'. *Journal of Information Technology Theory and Application* Vol. 4 (1), pp 43-64

Assael 1981, *Consumer attitudes and marketing action*, Boston Kent publishing Co. USA.

Bandura, A., 1977, 'Self-efficacy: Toward a unified theory of behavioural change' *Psychological Review*, 84, 191-215.

Bandura, A., 1982, 'Self-efficacy: Mechanism in human agency'. *American Psychologist*, 37, 122-147.

Bank 2004 Retrieved on June 06 from http://en.wikipedia.org/wiki/Bank

Baron, A. and Byrne D. 1984 *Social psychology – understanding human interaction*, (4th edition) Boston: Allyn and Bacon

Bates 1998, 'Provident ushers in Web based services' *Bank systems and technology* 35 (9) (1998) 46

Bauer, R.A. 1960, 'Consumer behaviour as risk taking' *Proceedings of the Educators Conference, American Marketing Association*, pp. 389-398.

Bauer, H. et al. 2005. 'Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study', *Journal of electronic commerce research*, vol. 6, no.3.

Beckmann, 2001, (Eds.), *Action Control: From Cognition to Behaviour* (pp. 11-39) NY Springer Verlag

Black, N. J., Lockett, A., Winklhofer, H. and Ennew, C. 2001. 'The adoption of Internet financial services: a qualitative study' *International Journal of Retail and Distribution Management* Vol 29 (8), pp. 390-398

Black, N. J. et al. 2002. 'Modeling consumer choice of distribution channels: an illustration from financial services' *International Journal of Bank Marketing*, Vol. 20 (4), pp. 161-173.

Bluetooth 2006. retrieved on June 06 Fromhttp://en.wikipedia.org/wiki/Bluetooth

Bradley, L. and Steward, K. 2002, 'A Delphi study of the drivers and inhibitors of Internet banking' *International Journal of Bank Marketing*, Vol. 20 (6), pp. 250-260

Cavanok, 1999, 'Will banks survive in the fast moving digital economy?', *Bank systems and technology* (36) 1 (1999) pp56

Cellphone 2006. retrieved on June 06 From http://en.wikipedia.org/wiki/Cellphone

Cellphone banking takes shape 2005. Retrieved on June 10, 2006 from http://www.fin24.co.za/articles/default/display_article.asp?ArticleID=1518-1786_1718968

China Construction Bank reports brisk e-banking business 2004. Retrieved on June 10, 2006 from http://english.people.com.cn/200407/27/eng20040727_150911.html

Churchill, G. and Iacobucci, D. 2002, *Marketing research: Methodological foundations* 8th edition. Orlando: Harcourt College Publishers

Compeau, D. R. and Higgins, C. A. 1995a. Application of social cognitive theory to training for computer skills', *Information Systems Research*, vol. 6, no. 2, pp. 118-143.

Compeau, D. R. and Higgins, C. A. 1995b. 'Computer self-efficacy: development of a measure and initial test', *MIS Quarterly*, vol. 19, no. 2, pp. 189-211

Coutts p. 2002 "banking on the move: characterizing user bottlenecks for m-commerce uptake" *communications research forum*, university of Adelaide

Davis, F. D. 1989, 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly*, vol. September, pp. 319-340.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1989, 'User acceptance of computer technology: a comparison of two theoretical models', *Management Science*, vol. 35, no. 8, pp. 982-1003.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R., 1992, 'Extrinsic and intrinsic motivation to use computers in the workplace', *Journal of Applied Social Psychology* vol. 22 no 14, pp. 1111-1132.

Daniel, E., 1999, 'Provision of electronic banking in the UK and the Republic of Ireland.International', *Journal of Bank Marketing*, Vol. 17 (2), pp. 72-82

East African discusses road ahead for Kenyan banks 2005. Retrieved on June 06 from www.sun.ac.za/News/NewsItem_1.ng.asp?ItemID=9002&Zone=A1 X)

E banking snapshot 2002. Retrieved on June 12 2005 from www.dbresearch.com

Electronic commerce 2006. Retrieved on June 06 from http://en.wikipedia.org/wiki/Electronic_commerce

Espirit and acts projects related to electronic commerce 1997. Retrieved on June 06 from Http p://www2.cordis.lu/espirit/src/ecoproj.htm

Fan, Y. et al, 2004, "Speech Interface: An Enhancer to the Acceptance of M-commerce Applications", *Proceedings of ISSNIP*, Melbourne, Australia, pp.417-422.

Fishbein, M. A., 1967, *Readings in attitude theory and measurement*. New York, NY: Wiley

Fishbein, M. A. and Ajzen, I., 1975, *Belief, attitude, intention and behaviour: An introduction to theory and research*, Reading, MA: Addison-Wesley.

Foxall, G.R. 1980, *Consumer behaviour – a practical guide*, New York: Chapman and Hall.

Godin, G. and Kok, G. 1996, 'The theory of planned behaviour: a review of its applications to health-related behaviours', *American Journal of Health Promotion* 11 (2), 87-98.

Grainger smith and Coppnheim, 1994, 'The role of Information Technology in investment Banks', *Journal of information science* 20 (5) 323-333

Gumbo, N.O, 2006, '*An investigation of broadband technology adoption in Kenya: The Case of the Banking Sector in Kenya*', Unpublished MBA project, UON

Harrison, T., 2000, *Financial services marketing*. Wiltshire: Prentice Hall. UK

Hartwick,J and Bark H, 1994, 'Expalining the role of User participation in information systems use.' *Management Science*, 40,4, 440-465.

Howcroft, B. et al P. 2002, 'Consumer attitude and the usage and adoption of home-banking in the United Kingdom', *International Journal of Bank Marketing*, Vol. 20 (3), pp. 111-121.

Internet banking 2004, retrieved on June 06 From http://en.wikipedia.org/wiki/Internet_banking

Jayawardhena, C and Foley, P. 2000, 'The changes in the banking sector-the case of internet banking in the UK). Internet research' *Electronic Networking Applications and Policy*, vol.10 1 pp.19-30

Katz, D. and Stotland, E. 1959. '*A* preliminary statement to a theory of attitude structure and change' *Psychology a study of a science* 3.

Kamel,S and Hassan, A .2003, 'Assessing the introduction of Electronic Banking in Egypt using Technology Acceptance Model' *ISOneWorld Conference proceedings*. Vegas, NV, USA, 3-5 April

Kenya 2006 Index of Economic Freedom n.d. Retrieved on 04th June 2006 from http://www heritage.org/research features/index/country cfm?id=Kenya

KDDI enters pact with Bank of Tokyo on mobile banking n.d., retrieved on June 10, 2006 from http://www.telecomasia.net/telecomasia/article/articleDetail.jsp?id

Kotler, 1954, *marketing management analysis planning and control*. N.Y prentice Hall Inc Englewood cliffs, 1995

Liska, A. E, 1984, 'A critical examination of the causal structure of the Fishbein/Ajzen attitude behavioural model', *Social Psychology Quarterly*, 47, 61-74.

Ling, R. 2001 'It is in, It doesn't matter if you need it or not, just that you have it' *Fashion and the domestication of the mobile telephone among teens in Norway*' Oslo: Working Paper, Telenor R&D, Norway.

Mattila, M. and Pento, T., 2002, 'Development of electronic distribution channels in Finland – M-banking usage and consumer profiles'. *Die Banking und Information Technologies*. Vol. 2, pp. 41-49.

Mattila, et al ,2002, '*factors affecting the adoption of mobile phone banking services*' Research paper in Finland.

Mathieson,K, 1991, "predicting user intentions: Comparing, Theory of Technology acceptance model with theory of planned behaviour," *Information systems Reseach* ,2,3, 173-191

Mbogo, S 2006. *CFC Bank Targets Mobile Users*. The East African Standard, May 15, 2006. Retrieved on 6th June 2006, from http://allafrica.com/stories/200605151326.html

McCall, Margo, 2002. "*Saving for a Rainy Day*." Wireless Internet Magazine. September 16, 2002.

Merwe, P.B, 2003, '*Mobile Commerce over GSM. A banking perspective on Security*'. Unpublished MSc Research at UNISA.

Minard, P and Joel B, 1979, "isolating attitudinal and normative influences in behavioural intentions model," *journal of marketing research*, pp 102-110

M-Banking in Africa – showing signs of growth n.d., retrieved on June 10, 2006 from www.foundation-development-africa.org/africa_special_projects/mbanking_in_africa.htm - 12k

Mobile Commerce 2006, retrieved on June 06 from http://en.wikipedia.org/wiki/Mobile_Commerce

Mobile phone 2006 Retrieved on June, 10 2006. From http://en.wikipedia.org/wiki/Mobile_phone

Mobile Phones - Security and Privacy n.d., Retrieved, 2004 retrieved on June 10, 2006 from http://wiki.media-culture.org.au/index.php

Mobile-phone banking expands into rural Philippines 2006 Retrieved on June 10, 2006 from http://www.chemonics.com/projects/default.asp?content_id

Mobile phone banking hits market. 2004. Retrieved on June 10, 2005 from http://www.chinaunicom.com.cn/

Mobile phone Communications 2003. Retrieved on June 10 2006. From http://www.galaxyphones.co.uk/mobile_phone_communications.asp

Mols, Niels Peter ,2001 'Organization for the Effective Introduction of New Distribution Channels in Retail Banking', *European Journal of Marketing* Vol. 35 (5), 661-686

Moggie, D A 2002,'*Launch of TM Cellular Mobile Banking and Payment* Via SMS' n.d., retrievrd on June 10, 2006 from http://www.kikm.gov.my/template02.asp?SpeechID=295&tt=SPEECH

Mohammad M. et al 2001, Mobile Commerce-The Emerging Frontier: Exploring the Prospects, Applications and Barriers to Adoption in Pakistan' *Published research in Pakistan*

Mohr, J 2001, '*Marketing of high-technology products and innovations*'. Upper Saddle River: Prentice Hall

Moore, G. C. and Benbasat, I. 1991, 'Development of an instrument to measure the perceptions of adopting an information technology innovation' *Information Systems Research*. Vol. 2 (3), pp. 192-222.

Mori, 2002, 'Embracing technology' The Egg report. Egg plc. London UK.

Mpayments, 2005. retrieved on 10th June 2006 from http://www.asb.co.nz/section719.*asp*

Ng'ahu, W.C, 1987, '*Attitudes of executives of large manufacturing organizations in Nairobi toward the social marketing concept*' Unpublished MBA project. UON

Olga, T, 2003, *E- banking in Estonia: Reasons and benefits of rapid Growth*. Tartu University Press Estonia

Osgood, C. E., Suci, G. J. and Tannenbaum, P. H., 1957. *The measurement of meaning*. Urbana, IL: University of Illinois Press.

Pedersen, P.E., et al., *2002*, "Understanding mobile commerce end-user adoption: a triangulation perspective and suggestions for an exploratory service evaluation framework", *Proceedings of the 35th HICSS*.

Pedersen, P.E., Nysveen, H. and Thorbjørnsen, H. 2002a. '*The adoption of mobile services: A cross service study. SNF-report no. 31-02. Foundation for Research in Economics and Business Administration*, Bergen, Norway. Retrieved on 10th June 2006 from http://ikt.hia.no/perep/rep3102.pdf]

Pedersen, P.E. and Nysveen, H. 2002b. '*Using the theory of planned behaviour to explain teenagers' adoption of text messaging services*.' Working Paper, Agder University College. Submitted to Information Systems Research. Retrieved on 10th June 2006 from http://ikt.hia.no/perep/ISR_Submission.pdf]

Pedersen, P.E., and Methlie, L.B. 2004. 'Exploring the relationship between mobile data services business models and end-user adoption'. *Submitted to the Fourth IFIP Conference on e-Commerce, e-Business, and e-Government I3E*. Retrieved on 10th June 2006 from http://ikt.hia.no/perep/i3e_paper2.pdf]

Personal Digital Assistant n.d.Retrieved on June 06 From http://en.wikipedia.org/wiki/Personal_Digital_Assistant

Peter P.J. and Olson, J.C. 1990. '*Consumer behaviour and marketing strategy*'. (2nd *edition) New Jersey. R R Donnelley and Sons Company*

Perumal, V. and Shanmugam, B. 2004. 'Internet banking: boon or bane'. *Journal of Internet Banking and Commerce*, December, 9(3), pp. 1-6.

Phone banking 2001, Retrieved on June 10, 2006 from http://www.hdfcbank.com/personal/access/phonebanking.htm

Polatoglu, V. N. et al. 2001, 'An empirical investigation of the Turkish consumers acceptance of Internet banking services', *International Journal of Bank Marketing*, Vol. 19(4), pp. 156-165.

Qureshi, S.,2003, "Information Technology for development", *IOS*, press Tokyo, Japan

Remmers 1954, *Introduction to attitudes and opinion measurement*. N.Y Harper Brookes Publishers, 1956.

Rogers, E. M. 1995, *Diffusion of innovations*: 4th edition. New York: Free Press

Runyon, K.E. and Stewart, D.E. 1987, '*Consumer behaviour and the practice of marketing*'. Columbus, Ohio: Merrill Publishing Company

Sheppard, B. H., Hartwick, J. and Warshaw, P. R. 1988. 'The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research'. *Journal of Consumer Research*. 15, 325-343.

Shimp, T and Kavas A, 1984 "the theory of reasoned action applied to coupon usage," *Journal of consumer research*, pp795-809.

Smart phones n.d. Retrieved on June 06 from http://en.wikipedia.org/wiki/Smart_phones

Smith R. 2001. '*Future for Mobile Phone Banking Systems*.' Retrieved June 6th, 2006. from http://www.eubfn.com/arts/brokat.htm

Spencer, R.H. and Johnston R.P. 2003. '*Technology trend predictions*' *retrieved* on June 10, 2006 from www.darwinmag.com/read/070103/wireless.html

Steiner, I. and Fishbein, M., 1965. *Current studies in social psychology*. New York Holt, Rinehart and Winston.

Statistics Finland, 2002. *Nordic Information Society Statistics*. Retrieved on January 2, 2003 from www.stat.fi/tk/yr/tietoyhteiskunta

Suganthi, Balachandher and Balachandran, '*Internet Banking Patronage: An Empirical Investigation of Malaysia*,' n.d. Retrieved on June 06 2006 from http://www.arraydev.com/commerce/JIBC/0103_01.htm

Suld 2002. '*Head of E-banking in Sampo Bank personal interview*'. June 10, 2006 from http://www.thefeaturearchives.com/

Tan, M. and Teo, T. S. H., 2000, "Factors influencing the adoption of Internet banking" *Journal of the Association for Information Systems*. Vol. 1 (5), pp. 1-42

Taylor, S. and Todd, P., 1995, 'Decomposition and crossover effects in the theory of planned behaviour: A study of consumer adoption intentions', *International Journal of Research in Marketing*, 12, 137-156.

Taylor, S. and Todd, P.A. 1995. '*Understanding information technology usage: a test of competing models*.' *Information Systems Research, 6. 144-176* Retrieved on 10 June 2006 from www.business.utah.edu/~actmc/7410_TaylorTodd.pdf

Thompson, R.L., et al, 1991, "Personal computing: toward a conceptual model of utilization", *MIS Quarterly*, Vol.15, No.1, 1991, pp.125-143.

Thornton, J and White, L. 2001, "Customer Orientations and Usage of Financial Distribution Channels", *Journal of Services Marketing*, Vol. 15 (3), pp.168-185.

Torres A. 2001. '*Breaking in the Electronic Wallet*.' Retrieved on June 10, 2006 from http://www.thefeaturearchives.com/topic/Archive:Breaking_in_the_Electronic_Wallet.html

Triandis, H.C, 1982, "*Values attitudes, and interpersonal behaviour*", in Nebraska symposium on motivation 1979: beliefs, Attitudes, Values, University of Nebraska Press, Lincoln, NE 195-259

The Scottish Banker, 1999, "*Your mobile the branch of the future*" November.

Venkatesh, V . and Davis, F D 2000, A theoretical extension of the technology acceptance model Four longitudinal field studies, *Management Science*, (46:2), 186-204.

Venkatesh, V et al., 2003, "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol.27, No.3, pp.425-478

Venkatesh, V., 1999, "Creation of favourable user perceptions: exploring the role of intrinsic motivation", *MIS Quarterly*, Vol.23, No.2, pp.239-260.

Vroom, V. 1969, *Industrial social psychology*, The handbook on Social psychology, Tata McGraw Hill, Publishing company Ltd India
5 200-208

Yeaman, A , 1988, "Attitudes, learning and human-computer interaction an application of the Fishbein and Ajzen model of attitude-behaviour consistency" *Proceedings of the Annual Meeting of the Association for Educational Communications and Technology*, New Orleans, LA, January, 814-818.

Wireless application Protocol n.d retrieved on June 06 From http://en.wikipedia.org/wiki/Wireless application Protocol

Wireless Application Protocol WAP *Mobile info*, n.d. retrieved on 10 june 2006, from http://www.mobileinfo.com/WAP/what_is.htm

Wireless Application Protocol – WAP Mobile info, n d retrieved on 10 june 2006, from http://www.mobileinfo.com/WAP/limitations.htm

Wilkie, W.L 1994, *Consumer behaviour* (3rd edition) New York: John Wiley

Whiteley, D, 2000, *e-commerce: strategy techniques and applications*: Tata McGraw Hill, Publishing company Ltd. New Delhi.

Ziff, D, 2005, 'Mobile Phone Technology Opens up New Revenue Streams' Retrieved on August 10, 2006 from http://www.webbuyersguide.com/bguide/whitepaper/Wpsearchresults.asp_Q_cboCategory_E_203_A_hidResTypeId_E_1

APPENDIX 1: Questionnaires.

Letter to the Respondents (users)

UNIVERSITY OF NAIROBI

SCHOOL OF BUSINESS

Telephone: +254020-318262

P.O. Box 30197

Nairobi, Kenya

Dear Sir/Madam,

I am a Postgraduate student undertaking a Master of Business Administration (MBA) degree at the School of Business, University of Nairobi. I am currently carrying out research with the aim understanding consumer adoption of mobile phone banking services in Kenya. I need to establish why For example why you use mobile phone banking services and what influenced you. This is a requirement to complete my MBA course project at the University of Nairobi.

Please provide the required information by responding to the questions in the questionnaire below. The information will be used for academic purposes only and confidentiality will be upheld. The name of your company will not be disclosed in the research.

A copy of this research project will be made available to you upon request. I will appreciate your cooperation in this academic exercise

Thanking you in advance,

Yours faithfully,

Mr. Ontunya, P N

Postgraduate Student

StudentNumber: D61/7508/03

ontunya@yahoo.com

Supervisor

Mr.Nixon Muganda

Lecturer, University of Nairobi, School of Business

Mobile: 0722-881851

Email nmuganda@uonbi.ac.ke

QUESTIONNAIRE

SECTION A:

Bank Name ---------- Branch ----------		
a	What is your Gender?	Male Female
b	What is your age?	Below 18 18 - 29 50– 59 30 – 39 60 and above 40 - 49
c	What is your highest education level	No Education. Primary Secondary/High School University/College 1-3 years University/College 4 years or more
d	What is your Account Type	Current Savings Fixed Other ----------
e	Do you currently own a mobile phone?	Yes No
f	If yes, How long have you used your mobile phone?	Less than 1 year 1- 4 years Over 5 years
g	If yes What is your mobile phone tariff?	Post-paid Prepaid
h	Does your bank offer mobile phone banking services	I do not know Yes No
i	If yes, Do you use your phone for any Banking transactions?	Yes No
j	Who introduced you to Mobile phone Banking.	Family member Colleagues at work I read/advertisement Other----------

To be answered by USERS OF mobile phone banking.
Please answer the questions as carefully as possible based upon your experience with or beliefs about mobile phone banking.

	Please indicate your level of agreement or disagreement with the following statements on a scale from -2 to +2 where -2 is ***strongly disagree*** and +2 is ***strongly agree***:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I get support to use mobile phone banking services?					
2	I use mobile phone banking Service because it is a secure service?					
3	A user friendly mobile phone keypad is important for mobile phone banking services.					
4	Mobile phone banking does not limit my banking options.					
5	Mobile phone banking services saves time?					
6	Mobile phone banking services is compatible with my lifestyle.					
7	I use Mobile phone banking service because it does not limit my banking options.					
8	The support I get while carrying out mobile phone banking service is important					
9	I am confident while using mobile phone banking services.					
10	I use mobile phone banking services because it save time					
11	I intend to stop using mobile phone banking service.					
12	Feeling confident while using mobile phone services is important.					
13	The mobile phone keypad is user friendly for mobile phone banking services.					
14	I use mobile phone banking because it is not expensive.					
15	I use mobile phone banking service because it is compatible with my lifestyle.					

To be answered by I SERS mobile phone banking
Please answer the questions as carefully as possible based upon your experience with or beliefs about mobile phone banking.

	Please indicate your level of agreement or disagreement with the following statements on a scale from 1 to 5 where -2 is **strongly disagree** and +2 is **strongly agree**	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
16	I tried using mobile phone banking before I adopted it					
17	Mobile phone banking instructions are easy to follow?					
18	My friends influence me to a great extent?					
19	My friends think i should use mobile phone banking service?					
20	My superiors/ senior colleagues influence me to a great extent?					
21	Mobile phone banking service is not expensive					
22	People who influence me a lot expect me to use Mobile phone banking					
23	Superiors/ senior colleagues expect you to use mobile phone banking?					
24	I use Mobile phone banking because instructions are easy to follow					
25	Mobile phone banking is well advertised in Kenya?					
26	Using mobile phone banking is a good idea.					
27	The decision to use a mobile phone is entirely within my control					

28	Mobile phone banking service is secure					
29	List your main reasons for using mobile phone banking services?	.... e g safe , convenient , fast , cheap etc				

Letter to the Respondents (Non-users)

UNIVERSITY OF NAIROBI

SCHOOL OF BUSINESS

Telephone: −254020-318262

P.O. Box 30197

Nairobi, Kenya

Dear Sir/Madam,

I am a Postgraduate student undertaking a Master of Business Administration (MBA) degree at the School of Business, University of Nairobi. I am currently carrying out research with the aim understanding consumer adoption of mobile phone banking services in Kenya. I need to establish why. For example why you do not use mobile phone banking services and what influenced you. This is a requirement to complete my MBA course project at the University of Nairobi.

Please provide the required information by responding to the questions in the questionnaire below. The information will be used for academic purposes only and confidentiality will be upheld. The name of your company will not be disclosed in the research.

A copy of this research project will be made available to you upon request. I will appreciate your cooperation in this academic exercise.

Thanking you in advance.

Yours faithfully,

Mr. Ontunya, P.N
Postgraduate Student
StudentNumber: D61/7508/03
ontunya@yahoo.com
0733607768

Supervisor
Mr Nixon Muganda
Lecturer, University of Nairobi, School of Business.
Mobile: 0722-883851
Email: nmuganda@uonbi.ac.ke

QUESTIONNAIRE:

SECTION A:

	Bank Name ---------- Branch ----------	
a	What is your Gender?	Male Female
b	What is your age?	Below 18 18 - 29 50 - 59 30 - 39 60 and above 40 - 49
c	What is your highest education level?	No Education. Primary/Middle level Secondary/High School University/College 1-3 years University/College 4 years or more
d	What is your Account Type	Current Savings Fixed Other ----------
e	Do you currently own a mobile phone?	Yes No
f	If yes. How long have you used your mobile phone?	Less than 1 year 1 - 4 years Over 5 years
g	If yes What is your mobile phone tariff?	Post-paid Prepaid
h	Does your bank offer mobile phone banking services	I do not know Yes No
i	If yes. Do you use your phone for any Banking transactions?	Yes No
j	If Yes Who introduced you to Mobile phone Banking?	Family member Colleagues at work I read/advertisement Other----------

To be answered by NON USERS mobile phone banking
Please answer the questions as carefully as possible based upon your experience with or beliefs about mobile phone banking

	Please indicate your level of agreement or disagreement with the following statements on a scale from 1 to 5 where **-2 is strongly Disagree** and **+2 is strongly Agree**	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Using mobile phone banking service is a good Idea.					
2	A user-friendly mobile phone is important in mobile phone banking services					
3	My friends influence me to a great extent					
4	I would need support to use mobile phone banking service.					
5	The decision to use mobile phone banking is entirely within my control.					
6	Mobile phone banking service instructions could be hard to follow.					
7	Using Mobile phone banking services is expensive.					
8	Mobile phone banking service is well advertised in Kenya.					
9	Mobile phone banking services is insecure					
10	Using mobile phone banking services could be time consuming.					
11	I do not use a mobile phone banking because I feel instructions could be hard to follow					
12	I would like to try using Mobile phone banking service before adopting it					
13	My friends expect me not to use mobile phone banking services.					
14	My superiors do not expect me to use mobile phone banking service.					
15	My superiors influence me to a great extent.					

PTO

To be answered by NON USERS mobile phone banking Please answer the questions as carefully as possible based upon your experience with or beliefs about mobile phone banking						
Please indicate your level of agreement or disagreement with the following statements on a scale from 1 to 5 where -2 is **strongly Disagree** and +2 is **strongly Agree**		Strongly Disagree	Disagree	Neutral	agree	Strongly agree
16	People who influence my behaviour think I should not use mobile phone banking service.					
17	I do not use mobile phone banking service because it limits my banking options.					
18	I do not use mobile phone banking service because it is not compatible with my lifestyle.					
19	I do not use mobile phone banking because it is time-consuming services.					
20	I would not be confident using mobile phone banking service.					
21	I do not use mobile phone banking service because it is expensive.					
22	The mobile phone limits my options of banking options.					
23	Compatiblity of mobile phone banking service with ones lifestyle is important.					
24	I do not use mobile phone banking services because it is insecure					
25	I intend to use mobile phone banking service if my bank offered it.					
26	Feeling confident while using mobile phone banking is important.					

To be answered by NON USERS mobile phone banking

Please answer the questions as carefully as possible based upon your experience with or beliefs about mobile phone banking.

	Please indicate your level of agreement or disagreement with the following statements on a scale from 1 to 5 where -2 is **strongly Disagree** and -2 is **strongly Agree**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
27	Support is important to use Mobile phone banking services.					
28	The mobile phone keypad is not user friendly for mobile phone banking services.					
29	What are your main reasons for not using mobile phone banking services?	---------- ---------- ---------- ---------- e g unsafe , unreliable , Slow , Expensive etc				

APPENDIX 2: Factor Analysis Outputs

Communalities

	Initial
Keypad User friendliness	1.000
Friend Inf.	1.000
Impotence of Support	1.000
Easy Instructions	1.000
Cheapness	1.000
Service is secure	1.000
Saves time	1.000
Superior Influence	1.000
limits banking options	1.000
Compatible	1.000
Importance Confidence	1.000
Intention	1.000
Importance of Trying	1.000
General Imp Influence	1.000
lack of Advertisement	1.000
Attitude	1.000
Control.	1.000

Extraction Method: Principal Component Analysis

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings(a)
	Total	% of Variance	Cumulative %	Total
1	4.022	23.659	23.659	3.750
2	3.242	19.069	42.728	3.055
3	2.183	12.840	55.568	2.279
4	1.686	9.918	65.486	1.951
5	1.211	7.126	72.612	1.924
6	.948	5.574	78.186	
7	.886	5.213	83.399	
8	.797	4.689	88.088	
9	.601	3.535	91.623	
10	.531	3.124	94.747	
11	.382	2.245	96.993	
12	.188	1.109	98.101	
13	.129	.757	98.858	
14	.111	.652	99.510	
15	.037	.219	99.730	
16	.027	.159	99.888	
17	.019	.112	100.000	

Extraction Method: Principal Component Analysis.

a When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Component Matrix(a)

a 5 components extracted

Table 4.13 Pattern Matrix (a)

	Component				
	1	2	3	4	5
Keypad User friendliness	.564				
Friend Influence					.489
Imp of Support			.737		
Easy Instructions	.787				
Cheapness		.613	.453		
System is Secure			.795		
Saves time		.976			
Superior Influence					.546
Limits banking options	.825				
Compatible		-.960			
Importance of Confidence				-.488	
Intention				.741	
Imp Trial			.803		
General Imp Influence					
Advertisement	.875				
Attitude				-.697	
Control.	.953				

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

a Rotation converged in 11 iterations.

Component Correlation Matrix

Component	1	2	3	4	5
1	1.000	-.118	-.045	-.035	-.085
2	-.118	1.000	-.014	.037	-.182
3	-.045	-.014	1.000	-.108	.097
4	-.035	.037	-.108	1.000	-.051
5	-.085	-.182	.097	-.051	1.000

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 3: Correlation Matrix

	EU1	FRINF	EU2	FC3	FC
EU1	1.0000				
FRINF	0245	1.0000			
EU2	1582	-.0090	1.0000		
FC3	-.0559	.2918	.2637	1.0000	
FC	-.2752	-.0196	-.0391	.1215	1.0000
FC2	0589	-.1340	.3491	-.2291	-.1809
PU1	-.1483	.1353	-.1188	.3536	.5704
SPINF	6301	.0133	.0929	-.3540	-.2330
PU2	.3152	.0737	-.1378	2629	-.2311
COMP	-.0788	.1642	-.0704	.3476	.4300
EFF	.1403	-.2367	-.1002	.3408	-.1732
BI	.0449	-.1681	2015	.1826	-.1216
TR	.0912	-.0700	.3024	-.1714	.0262
SN	.0131	.2419	-.0203	.1637	-.0458
ADV	.4143	-.0090	.1676	.3046	-.2714
ATT	.1533	-.1692	.1807	-.0793	-.0703
PCB	.4466	.1582	-.0343	.3417	-.2781

	FC2	PU1	SPINF	PU2	COMP
FC2	1.0000				
PU1	-.3179	1.0000			
SPINF	.1640	-.6063	1.0000		
PU2	-.1509	-.1589	.3233	1.0000	
COMP	-.2890	.9378	-.6305	-.2821	1.0000
EFF	-.2827	-.0177	-.0487	.4342	-.0676
BI	.0714	-.0626	-.1105	0062	.0229
TR	.8136	.0966	-.0116	-.4213	.1661
SN	-.1512	-.0197	.0717	.4907	-.0683
ADV	-.0553	-.0475	.2045	.7367	-.1236
ATT	.1659	-.0704	.1756	-.0054	-.0164
PCB	-.1226	.0416	.2011	.8491	-.0350

RELIABILITY ANALYSIS - SCALE (ALPHA)

Correlation Matrix

	EFF	BI	TR	SN	ADV
EFF	1.0000				
BI	.5698	1.0000			
TR	-.3239	.1344	1.0000		
SN	.0741	-.1454	-.2943	1.0000	
ADV	.4358	.2055	-.1922	2686	1.0000
ATT	.1545	.3098	.2092	-.0826	.1624
PCB	.4487	.1722	-.2172	.4216	8879

	ATI	PCB
ATI	1.0000	
PCB	.0038	1.0000

N of Cases = 67.0					
Inter-item Covariances Variance	Mean	Minimum	Maximum	Range	Max/Min
7.4324	.4448	-7.7899	10.6706	18.4605	-1.3698
Inter-item Correlations Variance	Mean	Minimum	Maximum	Range	Max/Min
.0763	.0679	-.6305	.9378	1.5682	-1.4873
Reliability Coefficients		17 items			
Alpha = .4172		Standardized item alpha = .5534			

APPENDIX 4 Definition of terms

Banking: It is the essential function of a bank is to provide services related to the storing of value and the extending of credit. (Bank, 2004)

Blue tooth: it is a telecommunications industry specification that describes how mobile phones, computers and personal digital assistants (PDAs), can easily interconnect with each other using short-range wireless connection with the ability of sending and receiving data, fax and multimedia (Blue tooth , 2006)

Cellular Telephone also Cellular Phone: It is a Mobile radiotelephone, often in an automobile, that uses a network of short-range transmitters located in overlapping cells throughout a region, with a central station making connections to regular telephone lines. It has become very similar to PDA with it one can do email without a PC connection, send, watch and listen to movies and audio. It incorporates blue tooth. (Cell phone, 2006):

E-banking: e-banking varies amongst researchers partially because electronic banking refers to several types of services through which bank customers can request for information and carry out most retail banking services via computer, television or mobile phone (Daniel, 1999;mols 1998; sathye, 1999). Electronic banking can be defined in various platforms: Online banking, Internet banking, Telephone banking TV-based banking, Mobile phone banking and PC banking (offline)

Internet Banking also Online Banking is a term used for performing transactions, payments etc. over the Internet through a bank's secure website. It is useful, especially for banking outside bank hours (which tend to be very short) and banking from anywhere where Internet access is available. (Internet_banking, 2004)

Internet commerce or Electronic commerce (e-commerce): It consists of the buying, selling, marketing, and servicing of products or services over computer networks. It is electronic business application aimed at commercial transactions. (e-commerce,2006)

Mobile Commerce, is the carrying out of any transaction with value – added for the user, which is carried out by means of mobile or wireless devices or infrastructure (me, ve, 2000). It is also known as M-business, which refers to any electronic commerce done in a wireless

environment, especially via the Internet. It can be done via private communication lines or public. It's provision of access to information, goods and services at any time an in any place on his moderate device. (Esprint 1997; mobile commerce, 2006)

Mobile phone banking: For the purposes of this study Mobile phone banking is the use of a hand held device usually used for voice communications for banking transactions i.e. using it to send instruction and retrieving transactional and bank account information. This could include voice but not limited to voice.(Merwe, 2003)

Personal Digital Assistant (PDA) it is a handheld wireless computer (Personal Digital Assistant, 2006)

Smart phones: Internet-enabled cell phones with attached applications (Smart phones, 2006)

Wireless application Protocol (WAP): enables mobile phone users to browse text only websites and to perform functions such as viewing email in a web based email account, browsing websites designed specifically or wireless devices (Wireless application Protocol n.d)

APPENDIX 5 Banks that offer mobile phone banking in Kenya

1. Consolidated bank
2. National industrial Bank
3. Co-operative bank
4. Commercial bank of Africa
5. Standard chartered bank

APPENDIX 6: Kenyan Banks

African Banking Corporation, Nairobi
Akiba Bank, Nairobi
Bank of Baroda, Nairobi
Bank of India, Nairobi (foreign owned)
Barclays Bank of Kenya, Nairobi (listed on NSE)
CFC Bank, Nairobi (listed on NSE)
Charterhouse Bank Ltd, Nairobi
Chase Bank Ltd, Nairobi
Citybank, Nairobi (foreign owned)
City Finance Bank, Nairobi
Co-operative Bank of Kenya, Nairobi
Commercial Bank of Africa, Nairobi
Consolidated Bank of Kenya Ltd, Nairobi (gov)
Credit Agricole Indosuez, Nairobi (foreign owned)
Credit Bank Ltd, Nairobi
Daima Bank Ltd, Nairobi
Delphis Bank, Nairobi
Development Bank of Kenya, Nairobi
Diamond Trust Bank, Nairobi
Dubai Bank Kenya Ltd, Nairobi
Equity bank
Equatorial Commercial Bank Ltd, Nairobi
Fidelity Commercial Bank Ltd, Nairobi
Fina Bank Ltd, Nairobi
First American Bank of Kenya, Nairobi
Giro Commercial Bank Ltd, Nairobi
Guardian Bank, Nairobi
Habib Bank A.G. Zurich, Nairobi (foreign owned)
Habib Bank Ltd, Nairobi (foreign owned)
Housing Finance Co. Ltd, Nairobi (gov) (listed on NSE)
Imperial Bank, Nairobi
Industrial Development Bank, Nairobi (gov)
Investment & Mortgages Bank Ltd, Nairobi
K-Rep Bank Ltd, Nairobi
Kenya Commercial Bank Ltd, Nairobi (gov) (listed on NSE)
Middle East Bank, Nairobi
National Bank of Kenya, Nairobi (gov)
National Industrial Credit Bank Ltd, Nairobi (listed on NSE)
Oriental Commercial Bank Ltd, Nairobi
Paramount Universal Bank Ltd, Nairobi
Prime Bank Ltd, Nairobi
Prime Capital and Credit Ltd, Nairobi
Southern Credit Banking Corp. Ltd, Nairobi
Stanbic Bank Kenya Ltd, Nairobi (gov)
Standard Chartered Bank , Nairobi (listed on NSE)
Trans-National Bank Ltd, Nairobi
Victoria Commercial Bank Ltd, Nairobi

APPENDIX 7: List of acronyms

ATM	Asynchronous Transfer Mode
POTS	Post Office Telephone lines
ISDN	Integrated Services Digital Network
WAP	Wireless Application Protocol
GPRS	General packet radio services
EDGE	Enhanced data rates for global evolution
UMTS	Universal mobile telephony system