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Master's Thesis

MOBILE BANKING IN DEVELOPING COUNTRIES

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Supervisor: Professor, Ph.D. Kari Smolander

Examiners: Professor, Ph.D. Kari Smolander, Associate Professor, D.Sc. (Tech.) Erja Mustonen-Ollila

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Helvi Nyerwanire
Helvi.Nyerwanire@lut.fi
blazincynth@yahoo.co.uk

ABSTRACT

Helvi Nyerwanire

MOBILE BANKING IN DEVELOPING COUNTRIES

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This Master's thesis examines the feasibility of eBusiness in developing countries by looking at the current mobile banking solutions. The research involved reviewing literature that was relevant to the research questions. It was discovered that the Wizzit and M-PESA are the current solutions to mobile banking. Furthermore, it was found out that the Wizzit and M-PESA were either transformational or additive. Additive mobile banking is the use of mobile phones as a channel to provide services to existing customers within financial institutions. Transformational mobile banking extends financial services to the unbanked. The results of the thesis are M-PESA works with only Safaricom while on the other hand Wizzit has compatibility with any mobile operator. The other result is that both M-PESA and Wizzit are transformational mobile banking technologies at the sametime Wizzit is an Additive mobile banking technology. Wizzit can provide financial services to both the unbanked and existing bank customers. It can be said the merits of Wizzit outweigh those of M-PESA which makes Wizzit better.

ACKNOWLEDGEMENTS

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ABBREVIATIONS

ABSA	Amalgamated Bank of South Africa
ATM	Automated Teller Machine
CBA	Commercial Bank of Kenya
CCK	The Communications Commission of Kenya
CGAP	Consultative Group to Assist the Poor
E-Business	Electronic-Business
EFT	Electronic Funds Transfer
E-Government	Electronic-Government
FNB	First National Bank
GDP	Gross Domestic product
GPRS	General Packet Radio Service
GSMA	Group Special Mobile Association
GSM	Global System for Mobile Communication
ICT	Information Communication Technology
IT	Information Technology
ISP	Internet Service Provider
IVR	Interactive Voice Response
J2ME	Java 2 Micro Edition
KCA	Kenya Communication Act
KPTC	Kenya Posts and Telecommunication Corporation
M-banking	Mobile Banking
M-Government	Mobile-Government
mG2C	m-Government to citizen
MMU	Mobile Money for the Unbanked
MNO	Mobile Network Operators
MTN	Mobile Telephone Networks
M-PESA	Mobile-PESA (Pesa means money in Swahili)
PCK	Corporation of Kenya
PDA	Personal Digital Assistant

POS	Point of Sale
P2P	Person-to-Person
SIM	Subscriber Identity Module
SMS	Short Messaging Service
STK/SAT/S@T	Sim Application Toolkit
TELKOM	Telkom Kenya Limited
UN	United Nations
USSD	Unstructured Supplementary Service Data
WAP	Wireless Application Protocol
WIZZIT	A South African Mobile Banking Service Provider
24/7	Twenty Four hours a day and seven days a week

1 INTRODUCTION

Mobile Banking is a new subset of Electronic Banking and it is regarded as a channel for banking services. Banking has other existing channels like telephone and internet Banking (Harma and Dubey, 2009). The internet banking is a prime executioner for financial services in the developed countries and mobile banking has picked up as becoming a primary channel for developing countries. Mobile banking is an extension of internet banking with internet having a web browser and mobile banking having mobile phones (Brown et al, 2003).

The structure of the economy in developing countries is described as a cash economy. It is so because payments are conducted using cash (Medhi et al., 2009). This can lead to understanding that the population is unbanked because they take responsibility for payments with no involvement of a bank.

The cash economy status of developing countries has provided ground for mobile banking. It can be said that the overriding limitations and problems of the unbanked enabled mobile banking develop solutions to address the problems. Once the problems and limitations were addressed mobile banking received a position of dominance in the developing countries. For instance in Kenya studies have reported that from the time M-PESA mobile money service was launched there has been exceptional growth with regard to customers from 900,000 in 2007 to 6 million in 2009 (Mas and Morawazynski, 2009). In South Africa the mobile phone market has 13 million subscribers and yet however the size it still is progressing rapidly in growth (Brown et al., 2003).

Mobile operators and mobile phones co-exist together one as a provider the other as the terminal. The mobile money services are using mobile phones provided by mobile operators to support their delivery of financial services.

The mobile money service is an innovation and a comprehensive added value service. The studies have given an account of successful existing mobile money services. The M-PESA and Wizzit are popular examples in Africa and the studies have attributed their successes to deregulation. Deregulation has enabled entry of mobile operators making it possible for competition. And where there is competition, there is always competitive attitude by the provider to offer competitive services to the market (Omwansa, 2009).

Mobile banking continues on as a global trend but with regard to this study it focuses on mobile banking from the perspective of developing countries. Therefore, there is a great deal of information giving an account of what is taking place in developing countries with regard to mobile banking. Therefore, it is of great concern to this study to go ahead discover and explore the occurrences of mobile banking in developing countries.

1.1   Motivation and Purpose of Study

The findings as a result of doing literature study are that studies previously done have been specific and focused to a particular mobile money service as a case study (Hughes and Lonie, 2007; Morawazynski, 2009). But with this current study it will involve different current mobile money services. The previous studies evaluated a mobile money service under its environment for instance M-Pesa within the context of Kenya and Wizzit within the context of South Africa (Morawazynski, 2008b; Hughes and Lonie, 2007; Omwansa, 2009). This study will instead generalise the different mobile money services

under developing countries. The requirements of the developing countries with regard to mobile banking will be studied in general.

1.2   Framework of Thesis

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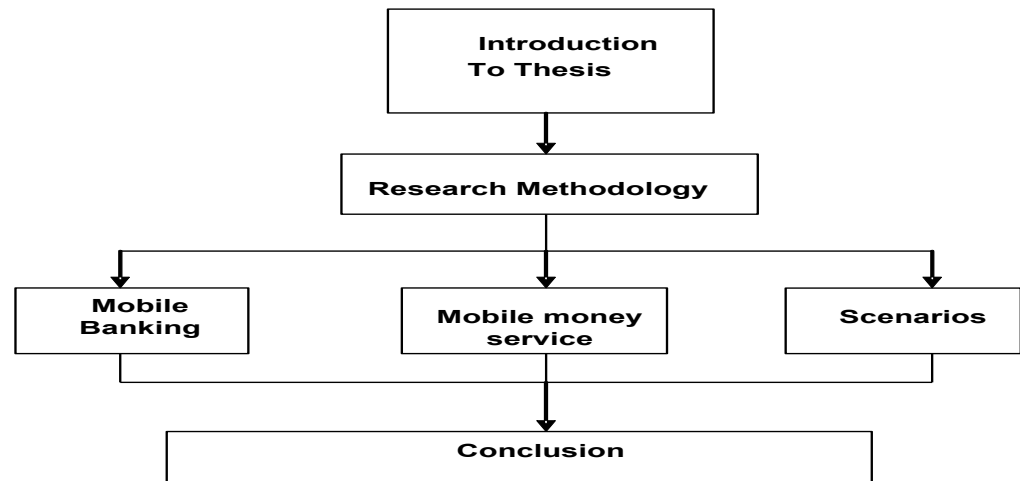
Figure.1 Framework of Thesis

The framework depicts the process through which the thesis will be flowing. The beginning will be about the introductory of the thesis and then followed by the Research Methodology. Then under Research Methodology there will be a logical flow of information from mobile banking, to mobile money service and scenarios, with finally the conclusion. Each component of the framework is explained as follows;

Introduction to Thesis   A brief introduction to mobile banking is followed by an introduction of developing countries and the financial status of the population and backed by a reason rendering mobile banking as significant in the background of this study.

Research Methodology The theoretical framework and concepts will show how the concepts in the framework are associated.

Mobile Banking The definitions of the concepts are stated to give a basic understanding of what each concept means.

Mobile money services The current mobile banking solutions address the fact that for a developing country to move into mobile banking, the condition is there must be the existence of a mobile money service.

Scenarios The section will give different scenarios where mobile banking is not applied and possibility statements to imply what can be the solution after Mobile banking is applied.

Conclusion The study in the previous sections will be summarised in this section and presented in a conclusion.

2 RESEARCH METHODOLOGY

2.1   Research Methods

Two research approaches were used, the literature survey and conceptual-analytical research approach. As a result of the literature survey and conceptual-analytical research approach a framework is created. The theories from the existing information are classified under a concept or concepts within the framework. The method of research to this study is to do with reviewing literature. And the literature sources backing up this study have undergone empirical studies and other methodologies.

Literature survey/ review refer to selecting a topic and writing it down and reflecting on it. This is followed by studying existing literature in relation to the topic of study. The literature review provides results of other studies that are closely related to the topic in study. It further creates possibilities for the ongoing topic of study by filling in research gaps and extending prior studies (Creswell, 2003).

Conceptual-analytical research approach involves the selection of a concept for inquiry and identifying its occurrence in a text or texts.

The primary information gathered was majorly from conference articles, journals, book publications, and internet sources especially for information that was not directly accessible from articles and journals and could only be got from the internet sources for example the mobile money for the unbanked GSMA Quarterly update report.

2.2   Research Process

The development of this study began by searching for legitimate academic material from the Lappeenranta University of Technology source the Nelli Portal. The topic basically guided me to what to search for in terms of information. I considered the aspect of the key word eBusiness support and used mobile phones. Then I was able to acquire a whole list of articles and journals on studies about mobile banking in the third world countries. While I was reading the literature, I discovered there were a lot of studies done on developing countries using mobile phones in banking. It led to the final change of the topic to mobile banking in developing countries.

The topic had been defined; the next step was to focus on journals and articles related to my topic to guide me in the development of my Research Questions. I searched the computerised databases under Nelli Portal like Elsevier, Emerald, Springer, Wiley and IEEE. I also found relevant information from the GSMA website under their programme Mobile Money for the unbanked and the programme has a published annual report. The literature in the report was in related to my topic.

The development of my research questions was supported with the help of the theoretical framework. I created first the concepts from the thesis topic and from the literature I reviewed. From the topic I picked the keywords mobile banking and developing countries. And in addition, since majority of the studies were based on current mobile money services, I used mobile money services as a keyword for the third concept. The discussions in the literature were about the uses of mobile banking and hindrances. The uses of mobile banking and hindrances were generalised as one keyword concept, social and governmental issues.

There was alot of literature to review for this study but priority was given to mainly literature information that was relevant to the research questions. The information providing answers to the research questions were considered relevant.

In this study the conceptual analytical research approach is carried out. It first begins by the conceptual framework where the concepts are formulated and the research questions are identified. The research question "what are the current Mobile banking solutions in developing countries?" focuses on the occurrences of mobile money services. At this I extract out from all literature sources where mobile money service explicitly appears. The aim is simply to examine the presence of mobile money services with regard to the question.

2.3   Theoretical Framework and Concepts

In this study a new framework is created, the concepts and the associations amongst the concepts are defined. (Järvinen, 2004)

2.3.1 Theoretical Framework

The Theoretical Framework is a base where concepts are related by using relationships (Järvinen, 2004). The concepts are first defined and then the relationships between the concepts are identified. The framework helps to create the research questions and by establishing relationships the research questions can be formulated.

Explanation of Figure 2 is that the concepts mobile money services, developing countries and mobile banking are all associated. The concept developing countries have information sources that propose it as emerging markets. The status of developing countries as emerging markets can be

observed from the result of the current mobile banking services. The R1 directed to the arrows is the Research Question one that states what the current mobile banking solutions in developing countries are. The concept of social and governmental issues provides theories to support the presence of mobile banking in developing countries. The R2 directed to the concept social and governmental Issues is the Research Question two that states what the social and governmental issues of mobile banking in developing countries are. Then finally the concept of scenarios is isolated from the other concepts because it is based on imagination. The R3 directed to the concept scenarios is the Research Question three that states what the future scenarios in developing countries are.
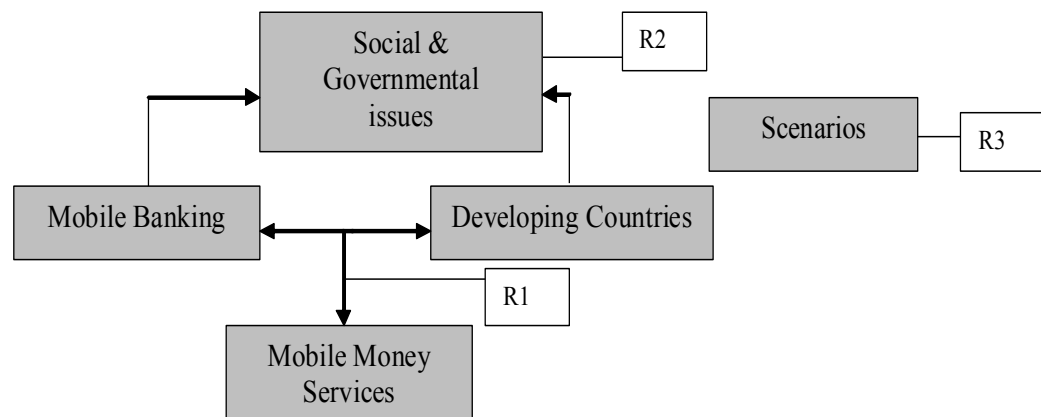
Figure.2 Theoretical Framework

2.3.2 Concepts

The Concepts are mobile money services, Mobile banking, Developing Countries, Social and Governmental Issues and Scenarios.

The Research Questions are;

R1. What are the current mobile banking solutions in developing countries?

R2. What are the social and Governmental issues of mobile banking in developing countries?

R3. What are the scenarios of mobile banking in developing countries?

3 MOBILE BANKING

3.1 eBusiness

eBusiness is defined as conducting automated business by applying information and telecommunication technologies. The technologies are the internet and intranet that facilitates an organisation to establish internal and external relationships (Plessis and Boon, 2004). Through eBusiness the organisation can connect with people and organisations worldwide hence building a global relationship of partners, suppliers and customers (Plessis and Boon, 2004). The term eBusiness is a general term and deals with the entire concept of electronic business. But under eBusiness there is what is known as eCommerce which is majorly about the buying of goods and services on the internet. Its focus is specific and is more oriented to business-to-business and business-to-customer. It can be said that over the years eCommerce has gone through the evolution process resulting to the enhancement of its technologies and potential. Today it has a new potential which is Electronic Banking that is mainly about execution of financial services via the internet. The Internet Banking is one subset of electronic banking and Mobile banking the novel subset at present.

3.2 Mobile banking

Mobile banking is an activity and it involves a customer accessing his/her bank account, managing that very account and performing other financial services via a mobile phone. Actually mobile banking is a relationship between technology and financial services and both depend on each other. Mobile banking has an additional definition; it is the extension of the existing payment infrastructure of a bank to mobile phones as a channel providing

financial services to customers in this study especially the unbanked (Krugel, 2007).

3.3 Mobile Money Service

Mobile money service is a platform created to facilitate the functioning of a variety of financial transactions via a mobile phone. It can be said that it's the core functionality of mobile banking. The mobile banking service is a technology created by developers and for it to be delivered to the customers it involves the support of the mobile operator, bank and vendor. For instance for M-PESA to deliver financial services to the unbanked it had the involvement of Vodafone as the vendor, Safaricom as the mobile operator and the Commercial Bank of Kenya (CBA) as the bank, providing conventional banking services (Hughes and Lonie, 2007; Krugel, 2007).

3.4 Additive mobile banking

In financial institutions the channels used to support the services of customers such as the internet, telephone and ATM. Additive mobile banking is where mobile phone are used as a channel to provide services to existing customers within financial institutions. Mobile phones have therefore been added to the range of options for existing customers to enjoy the convenience of banking services (Borg and Persson, 2010; Lyman et al, 2008).

3.5 Transformational mobile banking

Transformational mobile banking is described as leapfrogging from a cash economy to banking on mobile phones (Donnor and Tellez, 2008). This is because a large number of poor people who do not have bank accounts are carrying out transactions in their day to day lives using cash. But what

transformational mobile banking does it extends financial services to these people that have been unprivileged to the traditional financial institutions (Vodafone, 2007). The several reasons below elaborate further on transformational mobile banking.

The mobile operators are established with technologies and infrastructure to support telephony services to the public. In setting up M-PESA Vodafone embarked on utilizing an existing resource, Safaricom. This was transformational for Vodafone because it did away with costly expenditure in terms of setting up the infrastructure required for M-PESA to operate. And even to the customerbase it would have required them to incur costs on getting the relevant devices and software a price they could not afford (Hughes and Lonie, 2007).

The distribution network of agents is a point of contact between the mobile operator and its customerbase. The agents operate in every corner of the country. The distribution network of agents is already an existing resource for offering services to customers like airtime, mobile phone support etc. The reason to why its transformational is because the existing agents are used to facilitate the process of mobile banking such as they receive deposits from customers as cash into float or e-money and give withdrawals to customers from their virtual accounts as cash (Hughes and Lonie, 2007; Borg and Persson, 2010).

Transformational mobile banking taps into existing technology, for instance the STK technology which is actually the basic application of mobile communication known as SMS or text messaging. The STK technology is already in reach by the unbanked through their basic mobile phones. The reason to why STK is transformational is because it is a new application or a new way of using this existing technology (Hughes and Lonie, 2007). In

addition to being transformational it did not require innovating and manufacturing a new device to support the service but instead utilize the very devices that are already in reach and in use by the unbanked, mobile phones (Hughes and Lonie, 2007).

The prepaid model is a convenient business model for developing countries in terms of price, because it offers low prices. The current mobile operators selected prepaid as a choice because they studied the market and their attributes such as for instance income and their daily cost of living. The monthly payment of telephone services was costly to incur for the customers. The prepaid business model is used to set prices for airtime and SIM pack for a new mobile telephone line. It attracts the customers because customers can buy the airtime or SIM pack whenever they need the service without having to worry about monthly payments (Hughes and Lonie, 2007; Borg and Persson, 2010). The same business model used for voice and text messages has been adapted into mobile banking therefore tapping on an existing resource (Hughes and Lonie, 2007; Borg and Persson, 2010).

The transformational mobile banking has been able to introduce the unbanked segment to accounts such as stored value account offered by M-PESA and account payable at bank offered by Wizzit. The stored value accounts, the system through the agents' stores real money in a bank account on behalf of the customer while the customer can interact with float/e-money from the service. And account payable at bank, there is a contractual relationship between the service provider and the bank, such that Wizzit customers can deposit and withdraw cash from any bank branches (Lyman et al, 2008).

Transformational mobile banking involves the use of existing banking technology the ATM debit card. The customers can access cash from any

ATM point using their ATM debit card because of the partnership between the bank and service provider. The customer can make payments at a Point of Sale using the same ATM debit card (Hughes and Lonie, 2007; Borg and Persson, 2010).

In addition to what makes mobile banking transformational is that a branchless bank (mobile phone) operates synonymously with a bank branch. A customer deposits cash at the branch and accesses that very money on the account from a mobile phone (Pickens et al, 2009).

4 MOBILE BANKING IN DEVELOPING COUNTRIES

4.1 Requirements of the Developing Countries

4.1.1 Unbanked

In developing countries the population is constituted of the employed, unemployed and self-employed. The employed population are employed in different sectors of the country such as the public and private sector and because of their services it entitles them to a regular monthly income. The income such an employee receives is paid through the formal banking system and directed to their personal account. This group of the employed is not the majority in the developing country but a favourable small percentage. The employed are usually educated. Their status of education is a favourable advantage to the banking system because of the Bank's need of viable customers who can understand the operations of the Bank. Most of the operations provided by financial institutions in developing countries are customised for literate customers. There is the employed but who are earning at wage-level for instance a builder at a construction site, a domestic worker, a lawn mower, shop attendant, plumber, mechanic, farmhands, vegetable vendors etc. They receive wages in small money amount, below the amount required as a deposit inorder to open up a bank account. Then in the public sector there is a group of the employed termed as the local staff they are the semi-educated. These could be janitors (cleaners), tea makers, messengers, drivers, and post runners. They are also paid through the banking system but their salary earnings are low.

The self employed are both educated and uneducated group of population and these earn their income as private entrepreneurs. It can be an entrepreneurship like a Barbershop, Bakery, supermarket, textile boutique, consultancy law firm, etc. The bank charges of some banks on account

holders may be high and this may induce such a customer who is self employed to either retain it or discard it and use an informal means of saving that money.

The unemployed in developing countries are the majority. The unemployed are like students, people in rural villages and people living in urban areas. The unemployed with exception for students have erratic incomes. The unemployed group, the poverty cycle hinders their ability to access money and save it through a Bank (Comninos et al, 2008).

Then looking at the self-employed and unemployed their status of being unbanked makes them responsible for creating a cash economy. The possession of cash money is amongst them and not with the Bank. They take responsibility for transactions, payments directly without the involvement of a Bank (Medhi et al, 2009).

The unbanked have the potential to save, deposit, withdraw and perform any banking operation. The problem of the unbanked not being credible to formal financial services comes as an issue of concern and this is where information and communication technology is credited for the solution (Hughes and Lonie, 2007).

The unbanked being an issue affecting not one but several nations at large, has received worldwide attention. As the term unbanked is being discussed under this subsection, it is of relevance to point out the current events happening in favour of the unbanked. The Mobile Money for the Unbanked Programme (MMU) this is an initiative that was founded with the objective to connect the unbanked to financial services via mobile money services. This MMU programme has received funding from the Bill and Melinda Gated foundation so as to support their activities. The MMU is responsible for raising issues for discussions in relation to the unbanked. It in turn organises

conferences where the issues are put for discussions. The participants at these conferences are the mobile operator, Banks, microfinance institutions, donors and technology providers. For instance an issue for discussion can be regulations and how to approach the Regulatory Authorities in developing countries. The solutions provided during the discussion become information. The information is provided to the Regulatory Authorities and can develop regulations that grant mobile money service entry as a mainstream business for Mobile operator and to bank the unbanked (GSMA, 2009).

The Bill and Melinda Gates foundation is commended for their support towards the unbanked. This is because they have visualised the potential of the unbanked which financial institutions with an outstanding legacy of financial services have not been able to. The Bill and Melinda Gates Foundation have parted away with US dollars 12.5 million to support MMU (GSMA, 2009).

4.1.2 Financial Institutions

The Financial institutions are the banks that perform the banking services like withdrawals, deposits, accounts, loans and issuing documents like cheques, drafts and bank statements. The central Bank sets a policy that any business performing financial activities must get a licence of authorisation. This will prove that the activities of that business are legitimate (Omwansa, 2009).

The Financial institutions can be either public or private. Public Banks are known to be under the government. The public banks are used by the state to manage the pay rolls of public servants. And the public banks have microfinance schemes. This is to establish a means for low-income earners and self-employed people access to financial services. But microfinance has not been successful in providing access to financial services to the unbanked though it has endeavoured in assisting the poor (Boubakri et al, 2005).

The private Banks are targeted to the clients with high incomes. These are banks that are owned by an individual or partners. Their target segment is geared towards making profit. Their provision of financial services will be around the environment where their clients are located. Such a bank could not possibly extend their services to a rural area because the market segment there cannot afford banking. And it would be costly for them to maintain branches in a rural area (Boubakri et al, 2005).

The deficiency of the financial institutions towards providing banking services to low-income earners served as an opportunity to create a new segment. The mobile operator saw this opportunity and took advantage of the existing channel, the mobile phones to initiate the mobile money service. The mobile operator operating banking services are non-financial institutions and have received authorization from the central Bank authority to provide services to customers. The mobile operators that are non-financial institutions, mobile banking becomes an added value service for their existing customers using the communication telephony service. The unbanked segment for the mobile operator consists of the existing and new customers (Omwansa, 2009).

The financial institutions have realised that their access to a new market segment, is by instituting another channel which is the mobile phone. This has resulted in collaboration and partnership of mobile operator and financial institutions (Hughes and Lonie, 2007; Borg and Persson, 2010).

4.1.3 Mobile operator

The colonial system had many colonies in the developing world of Africa and Asia. The colonialists put in place a lot of the infrastructure such as telecommunication like fixed-line and roads. And after the independence of these colonies the new government systems took ownership of the

telecommunication infrastructure. In Africa the telecommunication sector was managed under a particular state ministry or body. For some countries telecommunication would be managed under the ministry of Defence. This would result to the telecommunication channels being censored for purpose of security and this depicted monopolisation (Zebaze and Keck, 2009).

The telecommunication system in the developing countries prior to liberalisation, were exposed to poor management. They would set high tariffs on the services, incase the telephone lines were broken down because of a storm it could take a long-time before it would get fixed. The customer services were sub-standard because the government was the monopolising the service. And without competition to challenge the quality of the service the provider would maintain the attributes of the service to be constant. For instance attributes like the prices will be high and the quality low. The delivery of the terminals like the telephones was through the provider of the service. The market could only have access to fixed-telephony only by using terminals provided by the provider. In addition there was the absence of value added service because the state would assign a ministry like defence to handle management like in the case of Gabon (Zebaze and Keck, 2009). The labour under defence was skilled in military and security and could not possibly apply those skills where communication engineering is required. This resulting to poor performance of the provider but because of its monopolistic position the market segment could not exercise preference and choice elsewhere (Zebaze and Keck, 2009).

The evolution of telecommunication led to the rise of mobile operator providing mobile telephony. The difference of mobile telephony to fixed-line telephony was that it was flexible with a wireless status. The mobile operators were mainly private companies that were ambitiously venturing to begin business in Africa. It was not until 1995 that the regulatory authorities

switched the telecommunication status from being monopolistic to being liberalised. In 1995 the fixed-line telephony remained state monopolistic and while mobile telephony started growing. By 2000 competition had been introduced in Africa such that by 2004 there was a rise in the mobile telephony operators where two or three of them would compete in the same environment (Zebaze and Keck, 2009; Gao and Rafiq, 2009).

The competitive environment created a market for the mobile operators. The larger the market grew the more competitive the mobile operators became by creating new services (Gao and Rafiq, 2009).

The mobile operators are continuously providing services to customers in both rural and urban areas. A machine without a user's manual has no value, so is technology provided to people without implementing an education environment (Mora et al, 2008). The solution for a rural area or village is to use an existing infrastructure like a school and deploy the wireless network. Through the wireless network the telecom operator's information center can be connected to the rural area or village (Rabbai and Ahsan, 2006).

The ICT technologies should be matched with the human resource, because in the case of establishing a network between the mobile operator and the rural village, a communication engineer will provide solutions. The right human resource is able to be productive with the technologies they are using.

Indeed it is also important for a mobile operator to extend awards to its market segment. The awards are always given to those using the services of the telecom operator and it creates awareness amongst those who do not use the services. The awards can involve education sponsorship to students to motivate them to keep on using the service. Cash prizes can be given to subscribers during a competition of buying tickets known as raffle. The

subscribers buy tickets that have a chance of prize money. The mobile operator can award customers free prepaid airtime for the purchase of large amounts worth of phone credit. Since these are developing countries they can organise community events to support fundraising a library and an ICT Telecenter for a rural village school. The mobile operator can involve their employees in doing volunteer activities like painting school classrooms and a hospital in a rural village. In addition the mobile operator can establish partnerships with handset vendors and promote the handset by giving it as a prize for a winning subscriber.

During the year there are usually many holidays, the holidays can be a period when the mobile operator can offer packages to their subscribers. They can for instance during Christmas, give Christmas offers of their services. In addition to the offers, most of the developing countries are former colonies so on the Independence Day, package offers can be given. The package offer can be free local calls and text messages for thirty days.

In the era of today's Developing countries, technology has instead supported criminal activities. For instance the mobile operators have no limit on the number of mobile numbers a subscriber can have. The SIM cards are sold at very cheap prices. The possibility of theft and other crimes is very high because these SIM cards to the mobile numbers are not registered. The mobile operator has the potential to establish tracking of these SIM cards by registering the subscriber at the point of purchase.

The subscribers usually engage with the services of the mobile operator, so there should be a good electronic administration for the processes of these services, so as to do queries for instance checking the airtime balance. For faster communication the bandwidth should be higher. Lower bandwidth

always causes breakage in communication, usually two subscribers maybe communicating and the communication breaks.

4.1.4 Mobile banking Technology Vendors

The role of technology vendors is to develop a platform for mobile banking. The platform facilitates the delivery of the service to the customers. Today the technology vendors that can be named are Vodafone, Fundamo, Cointel and G-Cash (Krugel, 2007; Hughes & Lonie, 2007). The mobile banking technology vendors created an environment that would require a bank, mobile operator and customers. The Bank would cater for the transactions, the mobile operator to ensure that they are delivered via mobile phone and customers the recipients.

The vendors are responsible for the development of the platform and other technologies. As stated in the preceding paragraph the platform enables the bank and telecom operator to integrate or link up. The integration of both will enable the delivery of the application to the customers. Then there are the vendors who develop technologies meant to interact with the costumer at the client side and technologies at the server side.

The most vital thing the vendors should take into consideration is providing skills so as to develop the actual applications. The human resource they want to use should undergo training and that means developing software that will help enhance their training. A well skilled human resource will give productive input and provide solutions in future and further development.

4.1.5 Mobile banking Technologies

There are a variety of mobile banking technologies by different vendors. The choice of a technology will depend on certain factors. Inorder for a mobile operator to conduct mobile banking, it has to look at the factor of cost. For instance Wireless Application Protocol (WAP) and Wireless Internet Gateway (WIG) are two alternatives to enable a phone perform a banking transaction. For WAP it enables access to the internet through the browser on the phone while WIG is a messaging service and the menu for transactions is downloaded from the bank to the SIM card and accessible from the phone menu (Brown et al, 2003).

On the basis of cost WAP is more costly than WIG, because WAP whenever a user makes a transaction then the dial-up connection is initiated. So for every transaction a call is charged (Brown et al, 2003). In the case of WIG the user uses SMS to make a transaction and the charge will be the cost of the SMS making it much cheaper. The handsets enabled with WAP are more expensive and the WIG-enabled handsets are much cheaper. The two technologies both provide security; WIG has the encrypted digital signature.

4.2   Unbanked Users

In developing countries there are regions with impoverished living standards. The people inhabiting those regions have low levels of education or none at all. Their incomes are below two dollars. The traditional financial institutions cannot be attracted to such a market. This has not hindered such poor communities from the ownership of mobile phones (Medhi, 2009a; Medhi, 2009b).

4.2.1 Low literacy Users

The Unbanked users as stated in the preceding subsection of 4.1.1 can be semi-literate or illiterate. These kinds of users can process information depending at what level of education they have attained. Then looking at the users with low literacy, they have only been exposed to informal education. Many are from the poor rural communities where there are no educational infrastructures. Many do not know how to read and write and those who can read and write would do so in their native language (Medhi, 2009b).

The literacy level of unbanked users can determine what their requirements will be when it comes to a user interface of a mobile banking money service. The current user interfaces to services are usually designed to suite literate customers. The Automated Teller Machines interact with users and provide complex information. The interactions of such systems are all about logic. And most literate users have had logic development through the experience of using computers. This logic therefore becomes tacit; the literate users can always come into interaction with any interface and feel familiar with it.

On the other hand users with low literacy level have not had the exposure to computers. And when it comes to designing a user interface that will well suit them, the designers should bear in mind simplicity, flexibility and efficiency. For instance the menus should be fewer so as to avoid mind confusion and a menu with navigation. The menus should bear buttons that make sense to the user. Following the standard of a user interface for a basic mobile phone can make it faster and simpler for the user (Medhi, 2009a).

The non-literate users primarily use the phone to send messages and voice communications. Other features on the phone that may appear complex for them to operate, they certainly avoid them (Medhi, 2009b).

The voice instructions and audio annotations have been discovered to be better understood. For instance inorder to check balance, make inquires and get customer help the user is required to dial a number and listen to the voice for which digit to dial for the respective options. In the case of non-literate users they can read numerical digits (Medhi, 2009b).

4.2.2 Mobile phone and SMS use in developing countries

The mobile telephony is the dominant means of communication in the developing countries. It has been estimated that one in every five Africans owns a phone (Rashid and Elder, 2009). The number of phone ownership is much bigger in China and India than in North America and Europe combined together.

The context in which mobile phones are used and the reasons to why they are used differ in comparison to developed countries and developing countries. For instance the fixed-line telephone was a telecommunication model meant for the developed countries (Vodafone Group, 2005). In the context of developing countries it is only limited to cities but not rural areas. The poorer people of rural areas could not possibly afford the requirements to have a telephone fixed in their homes let alone the monthly payments.

The developed world model of personal ownership is reflected in the fixed-line telephone (Vodafone Group, 2005). In the case of developing countries this would not be applicable and mobile phones have offset personal ownership. Mobile phones are informally shared. For instance kiosks have been positioned on street corners or pedestrian pavements with mobile public pay phones. Such that passers-by can make phone calls. In grocery shops they have notices on the door indicating a public mobile phone for making calls.

The innovative payment method, pre-paid technology has made it possible for mobile phones to be affordable. This is so because one can communicate even through text messages with less credit balance on their phone plus receive phone calls. The traditional fixed line payments have to be made monthly inorder to have the service provided or else the service company terminates it (Rashid and Elder, 2009).

In developing countries mobility is a valuable issue. The geographical obstacles like mountains and natural disasters like floods and typhoons have been barriers to installing fixed-line telephones. In a developing country like Haiti, there was no possible access to fixed-line because the floods had destroyed the infrastructure. The advantage of mobile phones it does not rely on infrastructure such as roads, phone wires (Vodafone Group, 2005; Rashid and Elder, 2009).

The SMS service on mobile phones is used for sending text messages. A text message sent to a device that is out of reach can be stored. The advantage of text messaging is that non-literate users can use it to communicate even in their respective indigenous language. In addition to that mobile handsets in developing countries are now cheaper. This is because second hand mobile phones are being imported from developed countries and sold in the developing markets (Sempa, 2008).

Competition in the developing countries has been as a result of the removal of barriers to initiate the private sector. The telecommunication market is growing extensively. It can be stated that services from the mobile operator can be affordable. The presence of many mobile operators offsets the objective to set high prices; prices are set all low because every mobile operator is targeting the same segment.

4.2.3 Proximity to Financial Institutions

The traditional banks extend their operations through branches that are setup in different locations. The branches are usually setup in towns and cities because of the surrounding infrastructure that facilitate the running of the branch. For instance towns and cities have good roads, telecommunication services like internet and fixed-line plus security. The businesses and employees within the location of the branch benefit from this advantage. Then the rural areas where electricity, telecommunication and roads are not available do not attract the attention of the bank to establish a branch there. Usually the inhabitants are unbanked and use informal banking methods. The businesses in the rural townships have to visit the bank often with regard to finances of the business. On Bank holidays and public holidays the branches have to shut down their services and those banking at the branches cannot have access (Morawazynski, 2009). And in case the ATM machine is shut down for servicing and the branch is far away then the customers have no access.

Branchless banking can be established via a mobile phone. A mobile phone user may always move around with cash to transact and make payments (Omwansa, 2009). But the device has an attribute of being wireless and the user can use it for financial services from where he/she is without travelling long distances to a bank branch. The services provided through mobile phones are time limitless and do not go on holiday. That implies a user can interact 24/7 with mobile banking services unlike banks that have opening hours and closing hours plus public holidays. The mobile banking services via a mobile phone are reliable, in case the user has a problem with a phone then it does mean the virtual account is closed, the user can insert the SIM card in another phone and still access the account.

4.3   Financial Institutions

The performance of banking services is aided by automated systems. The Automated Teller machine is a technology that has been in existence for some time. It enables the Account holder have access to the account via a card at any point of location where an ATM machine is available. The net banking enables bank customers have access to the bank services via the internet, therefore they can transfer; transact payments and other kinds of financial services via the internet.

4.3.1 Limitations

The ATM card system is a facility offered to customers by the bank but earlier stated in subsection 4.1.1 the unbanked cannot possibly have access to such a facility. The mobile operator and banks can provide mobile banking services. Through the mobile phones the unbanked can have a virtual account and perform transactions, money transfers and payments just like a bank customer with an ATM card. The objective of the ATM card is to get rid of the use of physical cash, the mobile banking service should be able to realise the same.

The unbanked people and many residing in the rural areas, they do not have laptops and computers because they cannot afford. And in addition they literacy level to ICT is low. These rural areas do not have electricity and only battery energy can be used for charging phones. Since the unbanked in rural areas do not consume utilities like water and electricity then the mobile banking service can be efficient for the unbanked in urban areas where electricity and water utilities are availed.

4.4 Client Technologies

The client technologies are services that reside on a user's handset or SIM card. The services have different attributes and are customised and provided by service provider.

4.4.1 SIM Based Applications

The SIM application toolkit known also as SAT/ S@T/ STK is a standard of the Global System for Mobile Communication system (GSM). This toolkit includes a set of commands that are programmed into the SIM card. The set of commands define the way the SIM should interact. It also makes up commands without the involvement of the handset and the network (Krugel, 2007). The application required for mobile banking is available in the market and not on the SIM card. The service provider will send messages to the consumer that is encrypted. These messages bear configurations of the application and will configure the application on the SIM card. The other is the service provider can provide the consumer with a new SIM card bearing the application on it. The consumer instructions can then be sent encrypted in SMS format for processing by the service provider (Krugel, 2007).

4.4.2 JAVA/J2ME

J2ME (Java 2 Micro Edition) is a feature enabling a mobile device to run small user-installable software applications that have been written specifically for mobile devices like phones. The memory of the phone should have enough capacity to execute and display the application (Krugel, 2007). The application is installed on the mobile phone. The application uses the GPRS, USSD and SMS to transport consumer data/ instructions from device to

service provider in encrypted format. The J2ME environment is flexible such that the downloaded application can be used across mobile operator with mobile internet support.

4.5   Server Technologies

These services are built to run on the servers. These services depend on the data sent from the client services to be able to process the transactions.

4.5.1 USSD

The Unstructured Supplementary Service Data (USSD) it is a text menu form of SMS received by a consumer. It transports small messages of 160 characters from a mobile phone and the network (Krugel, 2007). The SMS involves store and forward where by interaction client and service is broken down into a segment of communication. And the USSD involves a session the client and the application services can have interactive dialog within the confinement of the session. The USSD is further classified in to USSD1 and USSD2. USSD1 is one way communication oriented and user plus service interaction is broken down into communication like in the case of SMS where you have store and forward. The USSD2 the interaction between the user and service is immediate, the conversation in a session is streaming. There is no required pre-configuration of the USSD on a handset or SIM card because every GSM network has it inbuilt (Krugel, 2007). A registered consumer could dial a USSD string like *100# to get an SMS displaying his/her prepaid airtime account. The consumer could additionally want to perform a transaction and will enter a USSD string for example *120*1000#, 1000 means bank and then is retailed as *120*bank#. This sent as a request to the Telecom operator and will return to the consumer a text based menu (Krugel, 2007). The consumer will have to interact with the menu on the handset, by entering the number of

the option they require for example airtime top up could be press 1, balance inquires press 2, for person to person payments press 3, etc.

4.5.2 Interactive Voice Response (IVR)

This is a phone technology that enables a person calling to select options from a voice menu and interact with the voice system. Usually a pre-recorded voice is played and the caller on the other end of the phone can select the options given by the voice from the keypad, for instance press 1 for customer care, and press 2 for credit. The IVR technology functions in mobile banking, by the customer being registered and makes a call and given a menu options to press from the keypad by a pre-recorded voice. The choice selected from the keypad by the customer is taken as an instruction and transported to the service provider/Bank. The consumer's phone number is forwarded by the telecom operator to the service provider/ bank so as to authenticate the customer's identity (Krugel, 2007).

4.5.3 Wireless Application Protocol

This technology is known as an open international standard, for applications that use wireless communication. It enables a mobile phone or any smart device access to the internet. The Wireless Application Protocol (WAP) browser is synonymous with that of a computer but though it is simplified and tailored for within the constraints of mobile phone activity. The customer can browse using a WAP browser to a mobile internet site, but the handset has to have the functionality by the manufacturer and configuration provided by the telecom operator in order to support WAP banking (Krugel, 2007).

4.5.4 SMS Banking Solution

The Short Messaging Service (SMS) enables a handset user send and receive messages by inputting characters using the keypad of the handset. The messages go up to 160 characters long, and are sent to and fro from users of different or same Network operators. The consumers of the mobile operator can subscribe for news, entrainment, sports, etc that the consumer will receive in SMS format (Krugel, 2007). The SMS Banking involves a registered consumer that will create a transaction by sending an SMS message to a Mobile banking Service. That very SMS will entail a tag word identifier that will instruct the SMS gateway to send the message to the correct SMS application. It is usually the first word in the Structured Short Messaging Service (SSMS). The instruction of the customer can only be held by the SSMS depending on the balance on it, an example of a customer instruction to the mobile banking application, bank_balance_PIN for a SMS based bank balance enquiry (Krugel, 2007). The first word in the SSMS, "bank_balance_PIN" is a tag word. Let's say if the customer wants to transfer an amount of 400 from a cheque account to a savings account then the tag word in the SMS will be "bank_transfer_cheque_savings_400.00_PIN".

4.6   Summary on the Requirements of Developing Countries

The section was about the requirements of mobile banking; the unbanked is a major requirement preceding the study in this very section. The population of the unbanked can be differentiated by knowing their employment status to discover those without accounts. For the mobile operator many options have been discussed for their activities with the unbanked for instance education, matching the ICT technologies with the human resource, etc. The user centric of the service must be matched with the literacy level; the technologies used the cost and security as options to consider in terms of their choice. Mobile banking technology vendors have the role of developing the service and can provide   skills   and   training   to   the   human   resource   required   for   the

development. The proximity, the service is not within accessible reach to the users, and mobile phones are wireless, reliable and time limitless to provide a banking service to users.

5 CURRENT MOBILE BANKING SOLUTIONS

5.1 The M-Pesa Mobile Money Service

The current mobile banking solutions will be addressing the mobile money services in the developing environment where they are operating. The existence of a mobile money service serves as a reason for a developing country to move into mobile banking.

5.1.1 Background of Kenya's Mobile Telecommunication

In the Eastern region of Africa there were three countries under colonial leadership. It was until their independence in the early 60s that they decided to bound together and setup a corporation. This resulted to the East African community being founded by the three countries Uganda, Tanzania and Kenya in 1967. The purpose of this organisation between the three countries was to incorporate their infrastructures. Prior to the independence of the three countries the colonial leadership had setup roads, postal services; fixed-line telephone services railway and airline systems. After their independence all telecommunication services were in possession of the state. So the three states realised that to facilitate the corporation would enable the telecommunication services to be common for all the three countries (Omwansa, 2009; East African Community Portal).

But in 1977 the East African Community was dissolved and as a result Kenya had to establish her independent organisation to continue managing the telecommunication services. The Kenya Posts and Telecommunication Corporation (KPTC) was formulated. The KPTC was doing all the duties with regard to communication. The regulations established by the state parliament act favoured the position of KPTC as a monopoly. KPTC was controlling all the telecommunication services in the country, there was no existence of duopoly neither did it have competitors. Then in the later years of 1998, the

state under the parliament created the Kenya Communication Act. The purpose of this act was to make adjustments to the previous regulations. One thing that was done was to change the structure of KPTC and create within it five companies (Omwansa, 2009).

The five companies were the Postal Corporation of Kenya (PCK), Telkom Kenya Limited (Telkom), the Communications Commission of Kenya (CCK), National Communications Secretariat and the Appeal Tribunal. Each of the companies had their roles. Prior to the Act, it could have been that the KPTC operations in the country were not efficient. The same human resource was managing different operations even when the operations were not applicable to their skills. The companies each seemed to possess resources skilled for the operations they were to handle. For instance the Appeals Tribunal was meant to resolve disputes between operators, Postal Corporation of Kenya for handling postal services, Communication Commission of Kenya as a regulator, National Communication Secretariat as a communications policy advisory (Omwansa, 2009).

The Kenya Communication Act (KCA) had adjusted the existence of monopoly and duopoly to be replaced with competition but the Kenyan government accepted the Telkom to operate above this Act. It had a monopolistic position until 2004 when the environment was opened to competition by entry of other operators. Telekom prior to that year was in control of the national telephone services, internet backbone networks, Very Small Aperture Terminal (VSAT two-way satellite ground station) and International getaway services (Omwansa, 2009).

The Telkom is still in control of the national fixed-line and in September 2007 it was issued a licence to operate as a mobile telephony operator (Omwansa, 2009).

The mobile phone communication existed in Kenya in 2000 and it seems it is the environment where operators were granted entry. For instance Celtel and Safaricom both mobile operators since 2000, were operating as duopoly. It well seems that Telkom was allowed to operate as fixed-line monopoly until it gained its mobile licence in 2004, while Safaricom and Celtel had no other external competitors apart from themselves to operate as mobile operators (Omwansa, 2009).

The KCA was formulated for communication services and it does not promote electronic services. The Kenyan Government had to intervene and formulate the ICT policy that would promote electronic services like mobile banking (Omwansa, 2009). A bill was passed in 2007 in the parliament known as the Electronic Transactions Bill aimed at bringing to recognition electronic transactions and electronic signatures (Omwansa, 2009).

5.1.2 Description of M-Pesa

Vodafone is a telecommunications company in the United Kingdom (UK). It operates as a mobile telecommunication company providing mobile services to customers worldwide. Vodafone envisioned an innovation meant to help people in developing countries. This innovation started as an idea, so Vodafone needed funds for a start to see this idea begin its progress. Vodafone received the funding support from the challenge fund established by the Department of International Development (DFID) (Morawazynski, 2008b; Hughes & Lonie, 2007; Omwansa, 2009). The DFID is part of the UK government. DFID put in place the Financial Deepening Challenge Fund (FDCF) aimed at supporting the private sector in its prospects for development of emerging countries in accessing financial services. It appears that DFID is one of the stakeholders of Vodafone and Vodafone's methods is

to use the capital known as the challenge fund from its stakeholders instead of its profits inorder to further development.

The funding enabled the idea to progress to the next phase as a pilot. The plans set ahead for the pilot was to utilize the distribution network of Vodafone's child company, Safaricom. This distribution network were those selling airtime known as resellers the objective was to establish them as M-PESA agents. The second was to use an existing technology, the SMS which was being provided to subscribers by Safaricom. Vodafone sent out a team to do the pilot. The team went out to Kenya and the suggestion to buy software or to build the software was thought with concern. The limitation to buying software was that the service was meant for a developing country and the ones sold were designed to suite Western banking infrastructure. So the decision was to build the software for the service (Hughes & Lonie, 2007).

The other issue was to establish a pilot partnership that was a partnership between the Microfinance institution, Faulu Kenya and the Commercial Bank of Africa in Kenya (CBA). The reason for the partnership was because Safaricom was to provide connection of the service via mobile phone plus a distribution network of agents. The Faulu would provide the market and the CBA would provide storage for the customers' funds. The reason for CBA is because the service operates with e-money that mirrors the real money stored in CBA (Hughes & Lonie, 2007).

The next step was to involve Sagentia a British company that specializes in "blue sky" strategic development. Sagentia human resource skills were matched to the technology such that they were able to model the requirements of the idea and release the output.

The other issue was coining a name for the service and a local advertising was involved, it brought in the words pesa meaning money and M for mobile and so M-PESA was created (Hughes & Lonie, 2007).

The user centric aspect was put in perspective, the first consideration was that many Kenyans speak English and in rural areas they speak more of Swahili and their native language. And it was decided that the consumer handsets provided by Safaricom should have a provision of dual language. The idea was to have the menus on the phones translated and establishing that the Swahili messages would not exceed 160 words in an SMS text. The English language it was flexible to stay within 160 words (Hughes & Lonie, 2007).

The Kenyan mobile money service was finally launched in March of 2007 (Morawazynski, 2008b; Hughes & Lonie, 2007; Omwansa, 2009).

5.1.3 Banking Services

The Kenyan mobile money service has banking services just like the traditional banks except that it operates in a virtual format and not physical format. The traditional banking system will ensure that the customer to open up an account has an initial deposit a standard amount set by the bank. The M-PESA allowed the customers to open up an M-PESA account for free. The customers are only charged for making any financial transaction. The minimum amount for a traditional banks is high, here M-PESA requires Kenyan Shillings 100 equivalent to 0.89 Euros (Mas & Morawazynski, 2009).

Banking customers can always send money via money transfer from their account to another account. Even money transfer can be conducted through money transfer agencies or Foreign Exchange Bureaus. But with the M-PESA

money service, any M-PESA customer can send money via mobile phone to the recipient. The amazing thing with this service even a non-registered mobile phone user can receive money from an M-PESA customer. And even users on other Mobile operator can be recipients to an M-PESA user (Mas & Morawazynski, 2009).

Another service of the traditional banks is the ATM enabling customers access their accounts to withdraw cash. The PesaPoint partnered with M-PESA through Safaricom to provide M-PESA customers' access to 110 ATMs over Kenya. The M-PESA customers can therefore withdrawal money and they are only to use an authorization code and no bank card (Mas & Morawazynski, 2009).

5.1.4 Good Service Features

One crucial thing about understanding the partnership of Vodafone and Safaricom was actually for the benefit of M-PESA. Mobile money service was a new innovation, and for it to be recognised and adopted there was need for it to be delivered to the market by an outstanding Company. A company that would introduce it as its added value service to the market segment (Mas & Morawazynski, 2009).

The M-PESA service resides on the SIM card and therefore is loaded onto the phone menu. The merit of this kind of way is that the user does not have to download the service from the network each time it is activated for use (Mas & Morawazynski, 2009). The service is able to load quickly than if it was loaded from the network. The other merit is information is retrieved from a user one at a time. For instance if a use is to send money then he/she enters the phone number, followed by the amount, entry of PIN number then finally confirms okay. All this information is put together, processed and sent in one

text message. The advantage of SMS text message it requires less bandwidth and causes less data traffic unlike multimedia data. This system of using SMS for mobile money service is less costly for Safaricom.

The advantage of the service being located from the phone menu is that it can be simply found (Mas & Morawazynski, 2009). Take for an example the user centric aspect, low-literacy level users they are not familiar with the logic of electronic devices. These users will find it easier to follow a standard format. And it is that the M-PESA service is placed in the applications menu. Application menu is a feature that is standard in all mobile handsets.

5.2.5 M-Pesa Functionality

The consumers in Kenya use basic mobile phone that provide voice and SMS and that is text messaging. The service provider, Safaricom is using the SIM application toolkit that provides a menu. The menu feature is standard on any SIM card. In addition the M-PESA users need to create the banking services of deposit and withdrawal and that is done from the M-PESA agents. Agents are ubiquitous because they need to reach to the market (Hughes & Lonie, 2007).

The M-PESA user has his/her money in e-money format known as float after deposit or before withdrawal. The user can not physically use e-money (float), Safaricom had to partner with CBA to provide a real bank account and what the mobile money service does is to issue e-money to mirror real money in CBA (Hughes & Lonie, 2007).

The menus and SMS are provided in dual language, both English and Swahili. This is to cater for the market in the urban cities and rural areas.

The servers hosting the M-PESA mobile money service were placed at Safaricom. This was a good plan from the idea of it being setup at the bank. The reason why it was inappropriate for the servers to be housed at the bank because of the traffic between the bank transactions and the mobile money service would cause complexities. The infrastructure required for the operation and the SMS service plus the SIM application toolkit was in the hands of Safaricom. Then when Safaricom took on the role of housing the servers, the issue was the internet speed was slow. This is the African dilemma as per the internet unlike the West which is much faster. It would take weeks for one transaction to be accomplished before going on to another. This prompted the relocation of the main servers to the United Kingdom and they were connected to Kenya by an Internet Protocol link (Hughes & Lonie, 2007).

The user makes deposits and withdrawals in cash format from the M-PESA agent. The agent issues e-money equivalent to what was deposited in cash or issues in cash to the user as withdrawal depending on the e-money on the user's account.

Figure 3 below shows structure of the M-PESA menu, the menu shows the different menu options for the user to perform a task. The initial step the user goes to the main menu and selects Applications. From the applications menu the user finds Safaricom and selects it. The next is from the Safaricom menu, the user selects M-PESA, from M-PESA menu the user can select the options; send money, withdraw cash, buy airtime, pay goods, pay bill, ATM withdrawal and My account.
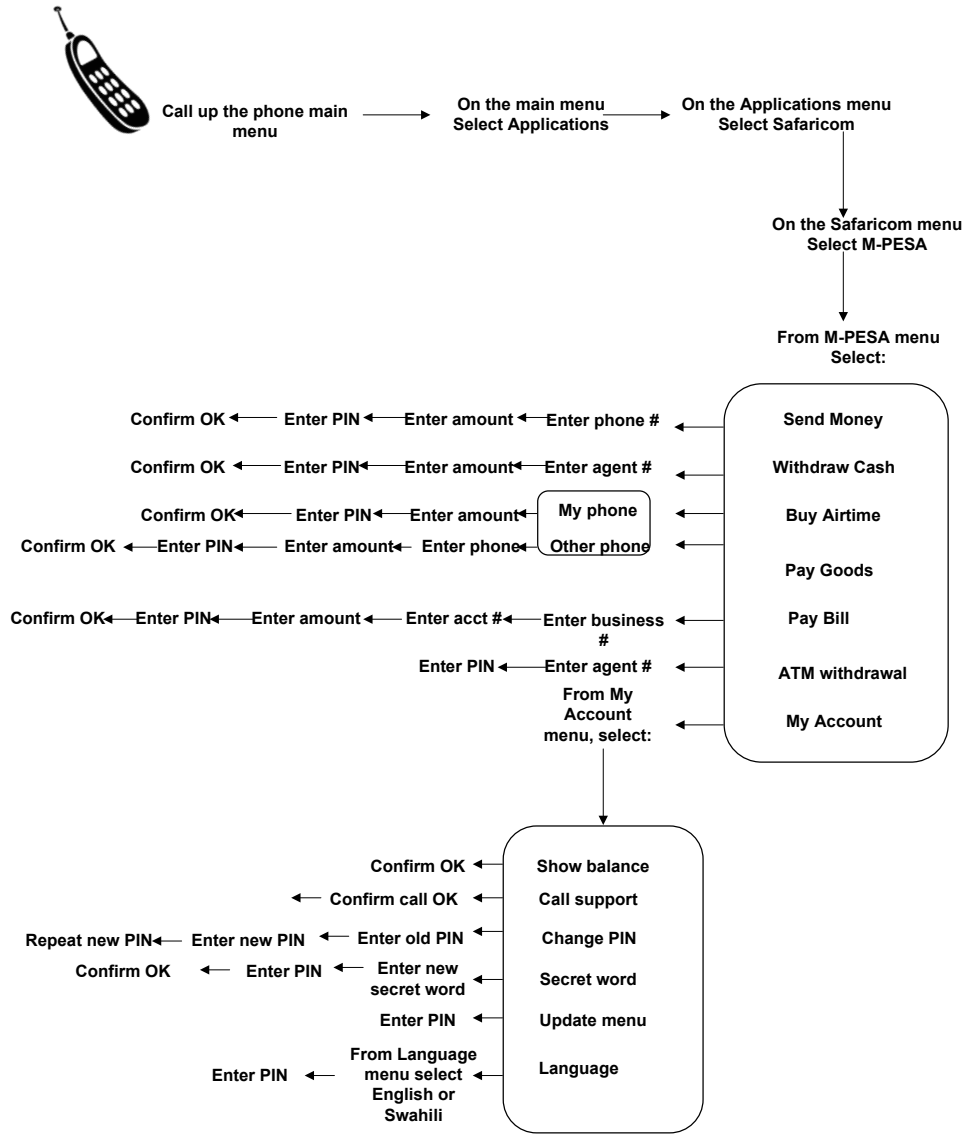
Figure.3 Structure of the M-PESA menu (Mas and Morawazynski, 2009)

The Customer opens an M-PESA account from an Agent outlet and provides all information required for example Identification. The customer buys M-PESA value known as float equivalent to the cash. The Agent receives float from the Head Agent office and it is deposited on to the customer's M-PESA account. The same customer returns again the following day to withdrawal from the account, money in physical cash. The customer withdrawals cash

from the Agent outlet in exchange for float. The float that was the customer's is transferred to the Agent Head office that sends it direct to the Head office float. At the same time the Agent Head office has to withdrawal money from the M-PESA bank account at the bank inorder to reduce the float money on the account.
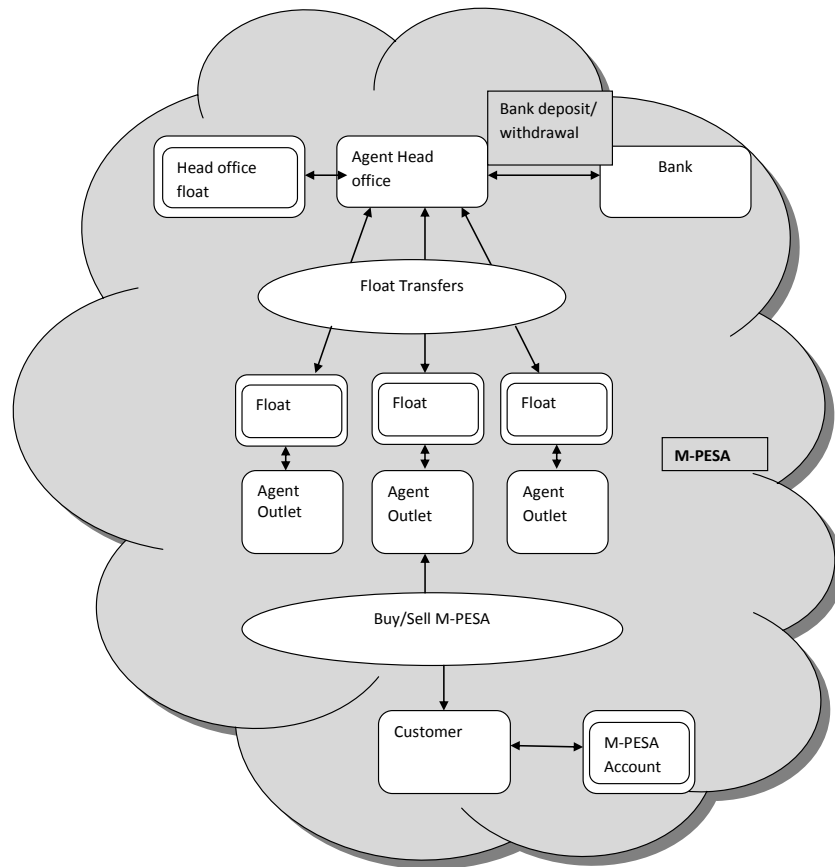
Figure.4 M-PESA System (Hughes and Lonie, 2007; Vodafone, 2007)

5.2   The Wizzit Mobile Money Service

5.2.1 Background of South Africa's Mobile Telecommunication

The era of colonialism in South Africa came along with development. This can be depicted by the establishments the colonialists set up such as infrastructure like roads, harbours, fixed-line, electricity, rail lines. Colonialism the main purpose of it was to restructure the South African colony to be the same like the native country of the colonialists (Fairweather, 2008). The reason for this is because the colonialists had their objective to create resettlement in South Africa. The government, legislation and infrastructure were in control of the colonialists and because of this it led to what was called Apartheid (Fairweather, 2008). The exploitation of the indigenous people continued from 1948-1994. However the indigenous people had a longing too as well share in these resources and because of this it stirred them to establish the African National Congress (ANC). The ANC was aimed at protesting for equality. It was not until 1994 that ANC saw results, with South Africa attaining a democratic environment by having the first democratic election. And since then the country has progressed in development.

The inception of democracy and the collapse of apartheid have led to South Africa having an outstanding infrastructure (South African Government Information, 2010). The communication sector is stated to make a contribution of 10% to the country's Gross Domestic Product (GDP). And the network has migrated from analog to being 99% digital, which includes the latest in fixed-line, wireless and satellite communication. It is reported that South is providing mobile network services to many African countries through its mobile network providers like MTN (South African Government Information, 2010).

5.2.2 Description of Wizzit

In South Africa the financial environment has four prominent Banks, which are the First National Bank (FNB), Nedbank, Amalgamated Bank of South

Africa (ABSA) and Standard Bank. These banks have been serving a specific market segment and these are the customers who can afford the banking fees and charges. However they have been providing banking services through ATM, telephone and internet banking. But the banks setup an extended channel known as mobile banking in 2000 for their existing customers. The strategy of their business model has not been the poor customer segment. Because the maintenance of the banking infrastructure is dependent on the flourishing profits coming in from the income sufficient customers. Now because of this seclusion from the banking facilities, the poor customer segment had to manage all transactions with cash. And outside the walls of the traditional financial environment a cash economy was created (Borg & Persson, 2010).

In South Africa the population was estimated as 48 million and 16 million out of that were unbanked. These 16 million relied on cash to make any transaction. But then stakeholders such as businessmen and politicians saw the problem of why there was the existence of a cash economy. And in 2002 they started the Wizzit Company as an independent provider that was behind the development of Wizzit a mobile banking service. The Wizzit Mobile Banking service was launched in November 2004 (Borg & Persson, 2010).

The Wizzit mobile banking service is an application, since it was developed by an independent provider it has compatibility such that it work across all mobile telecom networks , on all mobile phones. The Wizzit service is just an application that required the support of a bank. The South African Bank of Athens and Wizzit an independent provider formed a joint venture. The reason for the joint venture was because banks were licensed and had the authority to issue e-money.

5.2.3 Banking Services

The requirement of Wizzit are different from M-PESA, because for opening an account there is a charge for the starter pack, but there is no minimum amount set on deposit. Then with regard to transactions there are fees charged.

One advantage of Wizzit is its compatibility to work across networks; it's not tightly coupled to a network. Users from any network using Wizzit can send and receive money, for instance a user from Network A can send money to recipients' on Networks B, C and D. And A can also receive money from B, C and D.

The mobile banking service, adds a feature of a debit card linked to Maestro. The user can deposit cash at banks, purchase at a point of sale and withdraw from an ATM that is Maestro branded. Then it can be realized that Wizzit offers transacting through a banking account via mobile phones and debit card (Borg & Persson, 2010).

The Wizzit mobile banking service is a virtual bank and owns no branches. The joint venture with South African Bank of Athens (Absa) has enabled Wizzit customers to make cash deposits at any of its branches or the Postbank branch. The merit of this is that Absa is the bank with the most branches in South Africa (CGAP, 2006).

5.2.4 Good Service Features

The joint venture between Wizzit and Absa created distribution of tasks basing on speciality. Wizzit is a technology specialised to create accessibility to banking services via mobile phones. Then for Absa is a financial institution

specialised in providing deposit and withdrawal services. The idea to be realised here is Wizzit can only provide access to the account, but the account is not valuable without money on it. Therefore to operate an account with money then the customer has to deposit it to Absa bank. This is because that physical cash deposited is converted to e-money by Absa bank (Borg & Persson, 2010; CGAP, 2006).

The other fact is that Wizzit was a new idea innovated and therefore to gain recognition and trust it binded its capability by making delivery of its services through Absa.

5.2.5 Wizzit Functionality

The consumers in South Africa are connected to different mobile operators and own different vendor handsets. The merit of Wizzit is its ability to be compatible to work with any mobile operator and SIM card. The service interface is USSD. The service provider Wizzit is using USSD where any Wizzit customer receives a text menu in SMS format. It provides a limit to 160 words for messages. For instance a user can request for a transaction in a USSD string and will receive a text menu string to respond to the request. The distinguishing feature of USSD to STK is that USSD is not configured on a SIM. It is instead inbuilt on any handset or SIM card (Krugel, 2007).

The Wizzit works like this, a distribution network known as WizzKids are in all locations of South Africa. Before they begin their tasks they are trained on the basis of sales and acquiring new customers. The WizzKids get acquainted with their market from anywhere in the country, they can even reach the customers at their workplace or home (Borg & Persson, 2010). The WizzKid guides the new customer through the procedure of opening an account. The

starter package is offered at a retail price of 20 Rands (equivalent to 2 Euros). And in the package Wizzit offers a bank account and a Maestro card.

A customer even when overseas he/she can withdraw cash from any ATM with the logo Maestro because it is an international debit facility (Borg & Persson, 2010).

The customer can deposit the cash at any Absa branches or post offices, and for customer who is a recipient to money from money transfer can receive it in physical cash from WizzKids.

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Figure 4 shows the process of operations between the sender, recipient, WizzKid agent and ATM. In step 1 the sender accesses his/her Wizzit Bank account via mobile phone. Then the sender sends money to a recipient. In step 2 the money transfer system receives the request from the sender and then sends it to the recipient. In step 1 and 2 Wizzit wants to transfer money from sender to recipient, so it accesses the Money transfer system known as the inter-bank clearing house system. The inter-bank clearing house system is used to conduct financial transactions between financial institutions. Wizzit is regarded as an independent division of Absa. In step 3 the recipient receives a menu text in form of an SMS message through mobile operator. In step 4 the WizzKid Agent receives the transaction information and responds back to Money transfer system with a confirmation. In step 5 the agent after the confirmation is able to issue out the money in physical cash to the recipient. At the sametime the sender is issued a Maestro debit card by Wizzit and can withdraw cash from any ATM that is Maestro branded (Vodafone, 2007).
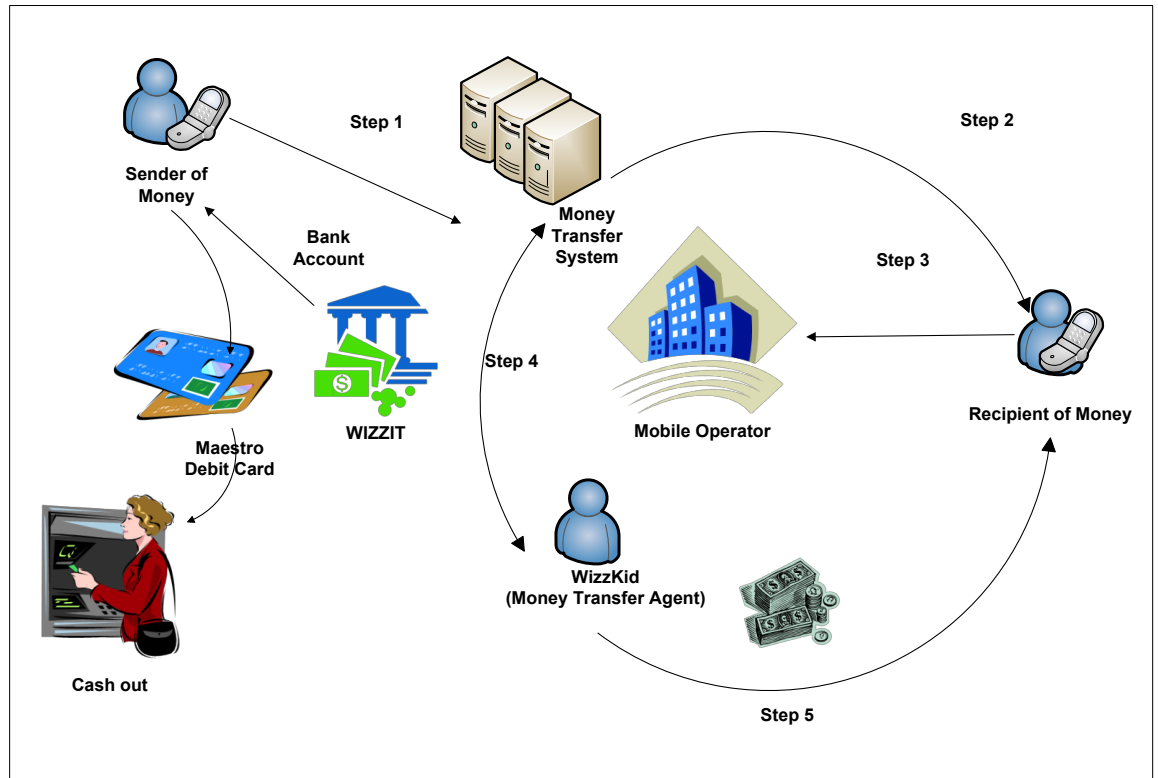
Figure.4 Wizzit Mobile Banking System (Vodafone, 2007)

5.3 The Comparison between M-PESA and Wizzit

Both M-PESA and Wizzit are credited for being mobile banking systems but each system despite meeting the needs of the unbanked, they both reckon to be different in features. The table below clarifies the difference through a comparison.

	M-PESA	Wizzit
Is training offered to match the tasks with human resource?	No	Yes, WizzKids undergo training.
Selection of technology?	SIM application with SMS	USSD

Date of launch?	March 2007	November 2004
Service provider?	Safaricom	Wizzit
Can the banking system be used by users on any networks?	No, only Safaricom	Yes, any
Who distributes the service?	M-PESA	The division of the African Bank of Athens (Wizzit)
What license does the distributor have?	No banking licence uses CBA to provide storage for users' funds.	Banking licence, and has a joint venture with Absa.
How do customers register for the service?	Through the M-PESA agent, the user provides an identity like driver's licence, passport, etc.	Through WizzKids and user provides personal information and identity
What are the requirements and fees for opening up an account?	To open an M-PESA account it is free, and minimum deposit of 100 Kshs (Euros 0.89).	To open Wizzit account user buys starter pack at 20 Rand (Euros 2), no minimum deposit.
Is a customer issued a card?	No	Maestro debit card
Does the banking system grant the user access to have multiple accounts?	Only if the user has different phones for each account	No
Can a user use another user's SIM/Phone for transaction?	No	No
Can a non user receive money?	Yes	Yes
Can a user receive from a non user?	No	Yes
What kind of provider?	Telecommunication provider	Independent Provider
What kind of mobile banking?	Transformational mobile banking	Both Additive and Transformational mobile banking
Is there person-to-person payments?	M-PESA grants only M-PESA account holders to do person-person payments.	Any bank account holder and Wizzit account holder can do person-to-person payments
Compatibility	It works with only Safaricom	It has the ability to work with any mobile operator

Cash entry and exit	Through agents and devices	Through bank branches, agents and devices

Table.1 Comparison between M-PESA and Wizzit (Lyman et al, 2008)

5.4 Summary on the Case Studies

The section brings into perspective the inception of mobile telecommunication in the preceding subsection. And from this colonial leadership is sighted as an influence to the establishment of all telecommunication infrastructures. Therefore Kenya and South Africa had a head start to realising the current development of mobile telecommunication. The good service features of using the existing technology of SMS text messaging, less bandwidth in the case of M-PESA. And for Wizzit the joint venture created distribution of tasks basing on speciality. The comparison between M-PESA and Wizzit brings in to perspective the ability to differentiate the two mobile banking solutions. One outstanding difference that makes Wizzit better is that it has the ability to work with any mobile operator within South Africa and M-PESA works with only one mobile operator Safaricom.

6 SOCIAL AND GOVERNMENTAL ISSUES IN MOBILE BANKING

This section brings together the innovative ways in how the mobile money services are utilized by the customerbase, as well as the factors influencing the existence of the mobile money services and influencing their operations. And the challenges that hinder the existence of the mobile money services from existing in some developing countries.

6.1 The ways in which the Mobile Money Services are used

6.1.1 Banking Tuition and School Fees

The months of January, May, and September are the commencing periods for school terms in Kenya and parents are busy paying school fees. M-PESA Agents have given reports that this is when parents are sending money for school fees via M-PESA to the cashier or Accounts clerk of the school if there is a mutual trust between the two parties (Omwansa, 2009). A confirmation message is received by both the recipient and sender via their phones.

6.1.2 Remittance of Funds

The urban migrant in Kenya come from rural areas and reside in areas of the city like Kibera and Eldoret (Morawazynski, 2008a). Their relation with the rural areas depicts that they have family they have left behind and move to the city to find employment as causal labourers as a means to support their family (Morawazynski, 2008a; Morawazynski, 2009). Many of the urban migrants are bread earners of the family and so the incomes they earn are remitted to their families through M-PESA (Medhi et al, 2009). In South Africa Wizzit is assisting Hair salon proprietors to have their customers remit money

to their account and send the same money they have earned to support their families in their homesteads (Borg and Persson, 2010).

6.1.3 Covering Payment for social Activities

During the evenings in Kenya, people want to relax outdoors by going to local clubs and pass time with their peers (Omwansa, 2009). These are public places and peak hours of the evening are when the customers are leaving and paying for the bill for the drinks or food. It is insecure for the customer to carry cash in hand in case of theft. Even on the side of the proprietors of the local clubs keeping cash behind the counters is prone to theft. M-PESA and Wizzit are the safest means to deal with payments and storage of money when in such places.

6.1.4 Solicitation of Funds

Farmers experience erratic seasons for instance during the drought spell, farmers face a shortage of food supply in their stores and since they depend on agriculture produce as an income they need external sources of income to backup their living during such a period (Morawazynski, 2009). There is the existence of a microfinance network and these are remitters and lenders operating through M-PESA (Omwansa, 2009; Morawazynski, 2009). This network of M-PESA customers creates value to farmers by remitting informal loans to the farmers during drought spells and the farmers can remit this money back to the lenders after their incomes have resuscitated. It is imperative to describe Kenya and South Africa under Hofestede's dimension of being collective (Hollensen, 2007). During preparation of wedding events, a death of a person or somebody hospitalized, it is imperative for the family members or friends to make contributions (Omwansa, 2009). In South Africa friends and family can use Wizzit to pay for funeral arrangements of the one

deceased whilst in Kenya contributions for a wedding are sent to the treasurer through M-PESA and this saves the cost on expenditure for transport costs and space to organize the fundraising (Omwansa, 2009).

6.1.5 Paying Transport Fare for Public Transport

The transport system in Kenya, M-PESA creates efficiency for both the passengers and the bus conductor. The buses are under private proprietorship and usually the bus conductor return the earning for the day to the bosses at the peak of the evening so in the morning he has either cash shortage or scarcity of the accurate cash note denomination to give the customers their balance (Omwansa, 2009). But with M-PESA in case the customer needs (Kenyan Shillings) KShs.50 and he doesn't have it in cash note, so the passenger will instead transfer float/e-money worth 50 Kshs to the bus conductor.

6.1.6 Employment Opportunities

The number of unemployed is extensive and so Wizzit has empowered this group with jobs as WizzKids and earning an income by selling Wizzit starter packs, doing promotions and marketing of the product and orienting new customers on how to use the product (Borg and Persson, 2010). On the other side of the coin M-PESA has over 5000 retail outlets in Kenya under proprietorship of a network of agents, Master (Super) agents perform liquidity management. The retail (Regular) agents orient customers on how to use M-PESA and register them, receive deposits and load it, transfer the cash funds and cash withdrawals (Morawazynski, 2009; Mas and Morawazynski, 2009; Jack and Suri, 2009; Omwansa, 2009).

6.2 The Factors Influencing the Mobile Money Services

6.2.1 Colonial Era

The colonial era brought about development in the urban cities of Kenya, such as new institutions were established, factories built and British settlement (Morawazynski, 2008a). All these created employment, in the factories factory workers were needed and the British settlers needed domestic workers. This would create rural urban migration of workers, so the colonial government set policies which would discourage permanent settlement such as temporary contracts, wages kept low and providing bachelor accommodation this would discourage family resettlement (Morawazynski, 2008a). These polices set root for remittance of funds because if the workers were not able to purchase land and resettle they instead invested the income in developing their rural homes and supporting their families (Medhi et al, 2009).

6.2.2 Involving Users in the design process

The uncertainty of user needs gives reason to why they should be involved in the design process because the designers have an abstract view of their context of use of the system (Kar and Hengst, 2008). In the case of M-PESA, a focus group comes about because of the demography of users who are majorly women and have their spouses working as rural-urban migrants (Morawazynski, 2009). The stakeholders gather this information because they need to know the progress of the system. The evaluation got from the focus group feedback, proves that the system is put into use in an innovative way, as a secret saving store (Kar and Hengst, 2008; Morawazynski, 2009). The focus group gives an account of what resulted to the secret saving store this is due to a set of mechanisms responsible for its formation, which are the risk of the money being stolen by their spouses, for purchasing household items,

in case of emergency, paying school fees, investing in business and accessing their account balance without the knowledge of their spouse (Morawazynski, 2009).

6.2.3 Seasonality

The seasons for the farmers have so many demands, during the planting season farmers need to make purchases for seeds, fertilizers, tools and labour. In the harvest season farmers need labour as well, M-PESA agents are well distributed in places like Bukura in Kenya where agriculture is a means of income. And the M-PESA agent retail outlets are said to be flooded with an influx of customers during both seasons (Morawazynski, 2009).

6.2.4 Consumer Brand Knowledge (Awareness) and Trust

Safaricom is a strong corporate brand because of what it represents as a voice telephony provider, and most of its market share is subscribers using the communication service it provides (Mas and Morawazynski, 2009). The existing customers using Safaricom have experiential trust which comes as a result of experiencing the services and features the company is providing. Then whilst new customers registering through M-PESA agents are built on initial trust because of the urgency of the needs that M-PESA will provide makes them ready to take risks (Chu and Yao-bin, 2009). It can be postulated that because of the experiential trust there is a strong brand presence and trust for Safaricom means consumer brand knowledge for instance they ensured that M-PESA Agent stores are painted Green of which Green is a representation of the Safaricom brand (Mas and Morawazynski, 2009; Chu and Yao-bin, 2009). Initial trust is built on structural assurance which with regard to M-PESA and Wizzit involves the protection of customer information by giving PIN numbers for account access.

The second factor it's built on is compatibility, with regard to M-PESA it has been transferred from online to online which is voice telephony to mobile banking. The customers have had prior experience with mobile phones and therefore mobile banking will be compatible as result of their previous influence (Chu and Yao-bin, 2009). Wizzit the transfer has been offline to online which is from land-based banks to mobile banking. The third factor is relative advantage which is the convenience and flexibility offered such that customer can send and receive money access the account 24/7 from a mobile phone without necessitating any proximity to a bank. The trust for these approaches M-PESA and Wizzit can be built through word of mouth, the M-PESA agents and Wizzkids deliver information that reckons the potential of the channels (Chu and Yao-bin, 2009; Medhi et al, 2009).

6.2.5 Events

The post-election violence in Kenya raised the number of M-PESA customers because of the need to access money was high. The banks were closed and so were the roads because of the riots, services could not be provided to the public. The M-PESA agents kept consistent in operation during this time because there was a high remittance of funds from friends and family to their relatives who needed transport to board buses back to their home towns. An Event influenced the market share of Safaricom to grow rapidly within a short time (Morawazynski, 2009).

6.3 Challenges Hindering Mobile Money Services

6.3.1 Regulatory Framework

The regulatory regime is where the government and Regulatory Authority are associated together. The Regulatory Authority is dependent on the government because it only authors polices on directives from the

government. For instance the government can set a policy hindering entry of external mobile operators so as to exercise monopolisation of the existing state-managed telecom operator. And this will in turn discard competition (Zebaze and Keck, 2009).

A developing country under a regulatory regime will have the telecommunication system like a telecom operator run by the government. The prices for fixed-line, internet and mobile are set and are usually high. And whether the services offered are substandard to the customer base the telecom operator is not intimated to drop down the price. For instance most of the current mobile operators are owned and founded by foreign entrepreneurs. Inorder to hinder competition that could possibly cause the monopolistic price to change, policies acting as trade barriers are put in place (Zebaze and Keck, 2009). Then this will block the entry of service providers.

The importance of competition is that it promotes innovative technologies and development and cause prices to be affordable in the context of the market.

The customers of a monopolistic telecom operator will respond with loyalty and experiential trust (Zebaze and Keck, 2009; Chu and Yao-bin, 2009).

6.3.2 Absence of the Two-sided Market

Platform is usually defined as infrastructure, products or services that bring together groups of users in two-sided markets (Anderson, 2010; Eisenmann, 2006). A two-sided market consists of mobile phone users and Mobile operator. Any developing country under a regulatory regime will have the telecommunication sector monopolized. Technology providers like Fundamo and Gemalto are developers of mobile Banking platforms. Technology providers work effectively only in a network where there is competition that creates subsidization on prices to cover the costs incurred in serving the two

groups of users (Eisenmann, 2006). But serving a monopolistic company will mean no recovery on development costs and service to both groups because prices imposed on customers is high. Since the technology providers are foreign entrepreneurs usually the regulatory policies are unfavourable and impose high tax tariffs and high license fees on them. Therefore deeming it infeasible for them to collect revenue because the value will not meet the demand in the market since the unbanked population can afford less a high price (Eisenmann, 2006).

6.3.3 Infrastructure

In addition to the existence of a Regulatory Regime, the telecommunication sector remains inefficient. The Telecommunication body is owned by the government and so the government manages its operations. This can be said so that governments of Developing Countries are not economically stable and most of the funds to run their public institutions are injected in from Foreign Donors in form of Grants and Loans (Enakrire and Onyenania, 2007a, 2007b). It becomes costly for an emerging economy of monopolistic status to handle a new communication technology like mobile Banking in the absence of competition. This is because their move from analog links to digital requires technical capacity to manipulate and maintain the infrastructure (Enakrire and Onyenania, 2007b). The technical capacity maybe outsourced and come along tagged with high salary charges because the mechanism of a competitor is absent that would have influenced the existence of a subsidized salary charge. And in addition emerging economies face a deficiency in training environments that would train potential technical personnel it's because they lack the resources that disseminate information in form of libraries and technology. Regional cooperation has been reported less successful in the continent of Africa because of the evident number of fewer

interactions by way of workshops and forums (Enakrire and Onyenania, 2007b).

6.3.4 Political Status

The political status of a developing country can determine the possibility of whether approaches of mobile banking will be present or absent in operation. The political leadership and military adventurism can affect the development of mobile banking because of the policies. Emerging economies that are militant could not possibly privatize the Telecommunication sector, because they would want to control information venting out of the country and sensor it for purpose of intelligence and security (Enakrire and Onyenania, 2007b). The political unrest such as civil wars, in some developing countries hinders the growth of the Telecommunication sector because foreign mobile operators could not take the risk of investing in such an environment examples include Liberia, Somalia, Sierra Leone (Enakrire and Onyenania, 2007b)

6.3.5 Different Sociocultural Traits

Religion, values, attitudes, Language, education, manners and customs forms the fabric of what is known as culture. It plays a role in the way people perceive a situation and approach it (Hollensen, 2007; Leonidou, 2004). In some countries they have a dominant culture that absorbs other cultures. This is good in the sense that there will only be the existence of one language (Enakrire and Onyenania, 2007a). For instance in Rwanda, Tanzania and Kenya they each have a dominate language that harmonizes the population. This is not the case for other Developing countries like Nigeria; she has several cultures with their own independent languages (Enakrire and Onyenania, 2007a). Therefore culture is a hindrance because it has an effect

on the way consumers will approach mobile banking. For instance in a case like Nigeria it's a big country with different regions, speaking respective languages. The service providers are faced with a challenge of developing a mobile Banking platform that serves all languages. A country with subcultures is a very costly expenditure to invest in by any mobile operator with regard to marketing, market research and developing a mobile banking platform that suits and satisfies all consumers (Leonidou, 2004).

6.4   Summary on the Issues

This section covers the three issues which are the ways in which mobile banking services are put to use, and the factors influencing the existence of the mobile money services and influencing their operations. And the challenges that hinder the existence of the mobile money services from existing in some developing countries. The ways in which mobile banking services are put to use are based on where money is invested in for livelihood, for instance education, family, leisure, transport, etc. The factors influencing the mobile banking services are the gap between the user and designers in knowing the requirements of the user, distribution network of agents are concentrated in the agricultural areas because of the harvest season there is an increased demand of M-PESA services by the farmers etc. Then the hindrances, especially the absence of competition because of regulatory polices is experienced in some developing countries denying the possibility for a transformational service to create opportunities for the nationals.

7 THE SCENARIOS

The scenarios will be about incidents or events. The incidents or events will be created imaginatively but observation and experience can be credited as well. The scenarios will definitely be about incidences where mobile banking is not used at all. Then it will reflect an unbanked person using informal measures of banking and problems faced as a result. The scenario will be supported by a possibility statement at the end that will state what can be possible after Mobile banking is applied. These scenarios were created through discussion and the author's experiences.

7.1 Shop Owner Scenario

A small shop called Spaza Shop is located in Khayelitsha Township, South Africa. The proprietor of the shop is originally from Somalia. He does not have a bank account for a number of reasons; such as he is in the country illegally. He does not have much money, but the little he has; he needs it to sustain the shop. The people from the neighbourhood are claiming that the owner of the shop is selling drugs to their children. So they come to confront the owner at the shop but unfortunately thugs take advantage of the situation. So when the angry parents are busy talking to the shop owner the thugs are stealing some products and the money hidden in a drawer of one of the cupboards. If the owner had been using mobile banking, the thugs would have only stolen the products and the money would still be safe in a virtual account via mobile money service.

7.2 Black Market Foreign Exchange Bureau scenario

In the slum area known as Kisenyi within Kampala city, Uganda, there is a small grocery shop run by a businessman called Musa. At the back of his shop is where he runs a small black market business operation of money transfer. He receives money from clients in Europe and the Middle East to deliver to their relatives and friends at a small commission. He has other businesses he operates in the city and has to multitask between them. On Thursday evening he receives money from four clients in London to deliver to their respective relatives. Musa's clients arrive at 11am in the morning on Friday to pick their money. Unfortunately Musa is held up by his business and cannot be there on time. The customers are kept waiting for an hour at his shop till about midday. The customers are upset because he is not conscious with time and is unreliable with his business. He finally arrives though late and is able to offer the service the customers require.

On Friday evening Musa receives money from a client in Dubai. The recipient of the money is a wife of the client and she lives 232 Kilometres from Kampala in a city called Fort Portal. The lady does not have a clue of where the grocery store is and only has Musa's telephone number to contact. She lives for Kampala city early Saturday morning by bus at 7:00am. And she arrives at 10:00am at the bus station. The first thing she does is dial Musa's number but it's off. At the bus station there are scooter transporters that ferry people around for a price. So she approaches one of them and politely asks for the place and gives the name of Musa's shop. One of the scooter transporters' knows the shop and Musa because he has ever taken a client there. Then she is ridden there and charged a fee for the distance ride. On reaching the shop Musa is not in and leaves a message with the shop attendant that his phone battery is low and left it charging. So he will be back within 30 minutes because he has run short of cash and has gone to withdraw more from the Bank.

The 30 minutes of wait turns to 3 hours, the lady is disappointed and decides to go. On reaching the bus station Musa calls her up to come and pick the money. Then she has to return again and pay another double fare for the scooter transporter. Musa is there at the shop with her money ready and apologises for the inconvenience caused.

If Musa involves mobile banking in his business it will enable him to be reliable and flexible. For instance through the mobile money service he can transfer the money sent from his clients abroad from his account to the accounts of recipients. And still carry on with his other businesses without movement up and down to the grocery store. And it would also save the recipients transport expenses.

7.3   The Orphanage Scenario

An orphanage is operating on donations and gifts. It happens to be located in South Africa and has been fostering children whose parents have died as a result of AIDS. So the coordinator of the orphanage makes an appeal to the public via a radio station, to help assist and support the voluntary work being done. The coordinator gives the account number for well-wishers who can send deposits to the account or the public can bring money in cash to the office of the orphanage.

From Monday to Friday the orphanage office receives visitors bringing in money in cash as donations. On Saturday the accountant is in the office by 8:00 am to finally receive the last donations. Then at 11:00am she has planned to be at the Bank to deposit the money before the Bank closes at 12:00pm. Then she receives a phone from a well-wisher who claims to deliver the money at 11:00am. So she waits for an hour and is delayed. The well-wisher arrives at 12:00pm and delivers the money. The accountant realises

it's past the closing time of the Bank and locks the money in the safe deposit of the office to be delivered on Monday morning.

Then on Sunday night there occurs an electricity short circuit that causes a fire and everything in the office is destroyed including the money in the safe deposit.

It was such a financial loss to the orphanage that couldn't be recovered instantly. On the contrary the mobile banking through the mobile money service would have offset the situation where by the public would have sent money via mobile money service to the mobile account of the orphanage instead of delivering money in cash at the office.

7.4 The Trip Scenario

James is a seafood merchant with his business located in Palawan Island in the Philippines. He supplies seafood to hotels and restaurants in the capital city Manila. He makes weekly visits to city with his motor boat and his motor boat has inbuilt refrigerators meant to preserve the seafood all the way through the trip.

On his way on the trip James receives a phone call from his wife and she informs him she has just had a sudden fever. She went in to the clinic to see the doctor and got medical consultation on credit and needs to buy the medicines. She does not have the money and she needs to buy the medicines urgently. James has to cut his trip short and return back to Palawan. He gives his wife the money and she is able to buy the medicines.

He is done with the family matter and begins the trip from Palawan heading to Manila. Just about hours of his trip then his motorboat starts to make a

squeaky noise and slows down and stops. Along the trip the meter was showing the petrol tank was full enough to cover the trip. Yet actually it was not. James has some credit on his phone and dials the gas station on the island. The gas station contacts their mobile boat petrol tanker that goes around on the waters and acts like a petrol station for boats. Then within thirty minutes it arrives to where James is because it was within the same distance. To fill his entire tank the money James has in cash is less and the mobile boat petrol tanker decline James's request for purchase on credit because they operate on cash on delivery. The mobile boat petrol tanker heads off.

James dials his friend and requests him to purchase fuel on his behalf and he will reimburse all the expenses incurred. The friend does as instructed and rents a boat to get to where James is. The friend takes about 3 hours before he is at the scene of where James is. James is able to fill his tank and bid his friend farewell. He reaches Manila city after sunset and is able to find his clients waiting for their products all day. The refrigerators operate on solar so they were able to keep the seafood in frozen state the whole time. He apologises to his clients provides the service they require and heads back to Palawan island.

James incurred a loss in time, if mobile banking is applied in this scenario James would have sent the money on his phone via mobile money service to his wife's mobile money account. She to would have transferred the money to the pharmacy's mobile account so as to purchase the medicine. Then it would have saved James time and exhausting his fuel that was meant for the business trip.

7.5   The Pocket Money for a Student Scenario

Mrs. Neema lives in Bukoba town, Tanzania. It is at the western shore of Lake Victoria so the means of transport to Uganda is by Ferry. Mrs. Neema is a parent and she has a daughter called Upendo studying in a Girls' Boarding school in the capital of Uganda, Kampala. She travels by Ferry to visit her daughter and pick her at the end of the school term. Mrs. Neema realised it's a transport expense for her to keep taking pocket money meant for her daughter's living expense. So she decides to use the post mail via the post office to send the money.

The first three times she sends money the daughter receives it, on the fourth instance, the daughter never receives it. It so happens that the daughter has malaria fever and needs money for medical treatment. Mrs. Neema decides to go by Ferry to take the money for her daughter. On reaching the harbour Mrs. Neema finds she has just missed the Ferry. Immediately Mrs. Neema rings a teacher at the school to whom she is acquainted to, to lend her daughter the money and at the end of the school term she will reimburse it. The teacher agrees. Upendo gets the money and gets the medical treatment. At the end of the school term Mrs. Neema pays the debt to the teacher.

If mobile banking is applied in this scenario, Mrs. Neema can transfer the pocket money via mobile banking to the teacher's mobile account so as to deliver it to her daughter. And incase the Boarding school permits Upendo to have a mobile phone, then Mrs Neema can send it to her daughter directly via the mobile banking mobile money service.

7.6 The Garden Scenario

In Mutukula a rural village, Southwest of Masaka in Uganda lives Marion an old lady of 75 years. She is a farmer and has a farm of potatoes, vegetables and vanilla. She manages the farm with her 18 year old granddaughter. The

farm is a source of income for her and she usually keeps her savings from the earnings she makes, in a metal box. The metal box she has dug a hole for it in her vanilla garden and hides it there. Her 18 year old granddaughter is not aware of it and nobody in the family knows.

On Saturday morning at 10:00am Marion receives a customer who buys her whole store of vanilla harvest. The money she receives for the payment is much more than usual. After the customer has left she goes with her hoe to the vanilla garden. She digs out the metal box and puts in the money. Meanwhile her youngest grandchild of four years has followed her and is peeking at her quietly from the fence. After finishing Marion goes back to the house to prepare lunch.

On Sunday morning she wakes up with a fever and pain in her chest. Her Grandson drives her to the clinic. She gets medicine and takes a rest at home.

On Monday morning she gets up at 11:00am goes outside the house to the bathroom and collapses. Her 18 year old granddaughter has a mobile phone and rings her uncle to come immediately. He drives Marion to the clinic, but she goes into coma and does not recover and sadly dies.

The family begins preparing her funeral but they do not have enough finances to prepare it. All the family members are aware that Marion used to save money but they do not know where. They check the whole house but cannot find it. They go on with the funeral.

After a month Marion's son is having lunch with his eighteen year old niece and four year old daughter. Then the four old girl reveals where she saw her

grandmother keep the money. She takes her Father to the vanilla garden and the money is found.

If Marion's granddaughter had not witnessed where the money was, it would have never been recovered. In mobile banking incase of a sudden death the family members can claim that money because it is stored in a virtual account.

7.7   The Flood Scenario

The City of Mumbai is located in the Indian state of Maharashtra and lies in the west coast of India. It is inhabited by 14 million people. The daily means of transportation for public commuters is the bus plus the train. The trains can accommodate more people than the buses. The city is annually hit by an unpredictable natural disaster known as monsoon rains.

Sanjay on Monday morning is travelling to work on the train in Mumbai city. The day seemed unpredictable for heavy rainfalls to occur. At about midday the monsoon rains begin. Sanjay is at his work place and starts anticipating of leaving work early before the floods start. And by 2:00pm the whole city is flooded, no means of cars or buses to pass, people are stuck in their offices, others in different places. For Sanjay he is already at the train station and has bought a ticket ready to enter the train behind a queue of passengers.

The train sets off; meanwhile at home his wife discovers her father-in-law has collapsed in the living room. During the monsoon season the old man gets attacks. She is a housewife and stays at home fulltime while her husband works. So she immediately rings Sanjay. Sanjay receives the call but unfortunately he is stuck in the train because of the floods. The train will not move for another three hours till the floods subsidize down.

Sanjay and his family are new in the area about a month. So the wife immediately asks a neighbour about any private hospital because roads to the Government hospital have been closed by the monsoon. The nearest private hospital is about 15 minutes away.

The wife and the father-in-law arrive at the hospital by taxi. The doctor recommends that the father-in-law has to be admitted. But Sanjay's wife only has money enough to pay for his medical bill. Since it is a private hospital they do not treat patients on credit loan.

Sanjay again receives a call from his wife informing him about the situation. There is not much he can do because he is stuck in the train and will not be out until the floods go down.

If mobile banking is applied in this scenario, Sanjay can send the money via his mobile phone from his mobile account. The money is transferred to his wife's mobile account; she can pay the hospital charge to the hospital mobile account. In the othercase if the hospital does not have a mobile money account, the mobile money services have agents stationed everywhere. She can go to the agent and withdraw the virtual money in cash.

8 DISCUSSION

In this study the banking solutions to mobile banking have been focused on two specific countries, Kenya and South Africa. And the reason is because each solution is different though their purpose is similar. The difference is Wizzit is both an Additive and transformational banking system while M-PESA is a Transformational banking system. Wizzit is an Additive banking system because it is used by retail banks for their existing customers to access financial services via mobile phone. And on the other hand why it is transformational is because it utilizes existing unemployed human resource to create a distributive network of WizzKid Agents. It sets up a business model to cater for the unbanked segment by establishing the pay as you go, prepaid starter package for a new customer opening up a Wizzit Account.

The M-PESA is transformational because of its business model that is targeted at the unbanked segment. By using existing technology that the unbanked are using such as the STK application, a distribution network of Safaricom agents now becoming M-PESA agents and pay as you go prepaid price model.

The banking solutions have enabled the unbanked meet the following merits as a result of transitioning from an informal system of banking to a transformational system of banking.

8.1   Affordability

Wizzit makes it affordable for customers because it uses the pay as you go prepaid business model. This so because a new customer gets a starter Wizzit pack that contains an account and even a bank card. It is affordable because the customer does not have to pay monthly fees and only has to pay

a minimum charge whenever a transaction is made. The requirements for opening an account are affordable such that it does not set constraints of minimum amount, a customer can put any amount small or big. In addition the handsets that are affordable are those with basic technologies. The amazing thing that M-PESA and Wizzit have embarked on is utilizing existing technologies like STK applications and USSD. In addition developing countries have opened their import market to importing second hand handsets from developed countries thus causing the prices on handsets to be slashed.

8.2   Accessibility

The youth in Kenya and South Africa are involved in the rural urban migration. They leave the rural villages to find jobs in the cities and in so finding work they remit funds to their families in the villages. And prior to these banking solutions they were sending the funds by either taking it physically themselves or paying a bus or taxi to deliver it. So now it is easier for their families to now access the funds. This can be said so because Wizzit has a distribution network of WizzKids who can even reach a customer's home or work place. The M-PESA has also the same model of a distribution network, M-PESA agents.

In the case of Wizzit the service is accessible via ATM because if the customer is within the vicinity where there is only an ATM available for withdrawing cash, then the customer can carry out the withdrawal with the Maestro debit card. This still continues with the fact that Wizzit is a division of Absa and so Wizzit customers can make deposits to any of its branches. Just incase a WizzKid is not available and what can be insight is the Absa or Postbank branch then the customer can carry out deposits at the branch.

Accessibility is not limited only to utilizing technology or a financial environment. Other means can be used for instance Wizzit struck a partnership with Dunns a clothing store. The two partners in the partnership were both interested in the same kind of customer market, people with low incomes. Dunns is a chain store and so had stores in different locations. At Dunns store a customer could access a Wizzit account for purchase. This is to the advantage of Wizzit because where WizzKids are not available the customer has a choice to use Dunns store. The store even provides services for replacement of SIM cards and PIN codes to the debit cards.

8.3   Availability

The WizzKids are equipped with the Wizzit starter packages to make sure that incase they are approached by a potential customer it is available to the customer. The WizzKids make acquaintances in every area where they operate and incase they are short of starter packages the network of acquaintances plus fellow WizzKids can supplement to assist with a free one. The customer will open an account and the banking service is available 24/7, as long as the customer has a handset and for Wizzit connection to any mobile operator for M-PESA to Safaricom.

A utility like electricity, the consumers have the electricity disconnected if payment is not made on time. So now M-PESA and Wizzit can have customers paying for the utility at anytime. Even purchasing airtime no longer requires a customer to walk up to a kiosk or retail shop, the service to purchase airtime is available for the customer through M-PESA and Wizzit.

8.4   Convenience

It provides convenience because a customer does not need to go to the bank to make a rent payment; the customer just does it with convenience from a handset. Regular payments performed by business people are transacted from the handsets without making a trip to the bank or supplier.

8.5   Compatibility

One advantage of Wizzit is its compatibility to work across networks; it's not tightly coupled to a network. Users from any network using Wizzit can send and receive money, for instance a user from Network A can send money to recipients' on Networks B, C and D. And A can also receive from B, C and D.

8.6   Cost

Both banking solutions use the pay as you go Prepaid business model the cost of this compared to monthly payments is much suitable for the kind of market segment the banking solutions are focusing at. Then cost of transacting is set on the type of transaction conducted.

8.7   Reliability

The traditional financial institutions that shut down on public holidays, weekends and are closed after the standard weekly working hours, the banking solutions are not constrained by time. The banking solutions offer services to customers at anytime, anyplace and on any day that is why they are reliable.

8.8 Security

The system of PIN code enables to guarantee security. Even during opening of a mobile account the customer's identity is recorded. And for a bank account it requires one user. For a secure environment two accounts cannot operate on one phone, each account has to be on a separate phone.

8.9 Tangibility

The Mobile banking service is understood as being intangible because it is a virtual service. But in the case of Wizzit the service can be tangible to the customer through the Maestro debit card.

In addition the essence of the service's tangibility exists whenever the customer has to withdrawal and deposit money for the case of M-PESA through an M-PESA agent and for Wizzit through Absa Branches and ATMs.

8.10 Trust

The strategy of Wizzit is using existing unemployed human resource. And most of them are young people from communities. It is easy for trust to be established between the customerbase and Wizzit in a particular community because the WizzKid carrying out the operations is known to the customers. For instance a former high school student is employed as a WizzKid in his village, so he is able to market the services to people in his village easily because they know him.

8.11 Future Development

The traditional financial institution is likely to face removal of its existing channels in the future. The channels include branches and ATM machines. The reason to this is maintaining these branches are a costly venture such as in terms of resources like infrastructure and human resource (Pickens et al, 2009).

Today mobile banking utilizes the existing channels for instance Wizzit uses ATM machines to give its Maestro debit card customers access to funds and Wizzit customers use the partner bank branches to make deposits and withdrawals. The current situation is crime is gradually rising rapidly where by ATM machines have been bombed and high profile armoured car robberies have taken place and even bank branches can be a target for bank robberies (Pickens et al, 2009).

The Mobile money Ecosystem has been suggested as a future development and to the author's opinion this could be a remedy to fill the vacuum created after removal of the existing channels (Omwansa, 2009).

The Mobile Money Ecosystem is mainly about plugging in different stakeholders like the government, non-governmental organisations, merchants, banks, etc. The purpose of this ecosystem is because a service provider offering mobile banking services cannot offer all the needed services. But with the collaboration of players in the ecosystem the value is greater for instance pension funds can be paid and government salaries. A merchant like western union has numerous customers in developing countries as recipients so if it is a player in the ecosystem then it can provide an additional service (Omwansa, 2009).

It has also been suggested for future development Safaricom should enable compatibility thus rendering M-PESA to operate across networks (Omwansa, 2009).

The other issue is regional transactions; currently M-PESA and Wizzit are operating transactions locally. But as stated in sub section 5.1.1, Kenya is an East African country and there is a presence of cross boarder activities between her and neighbouring counterparts like Uganda and Tanzania. A lot of business people are travelling in between the East African countries to do business. They are always travelling with cash and have to change it to the currency of the other country so as to engage in their business ventures. It has been suggested for future development that an African or East African e-currency can be created. This can be flexible within the East African environment because currently M-PESA was launched in Tanzania by Vodacom, a sister company to Safaricom. Therefore it's about creating a cross-border system of money transfer and financial transactions while using an African e-currency (Omwansa, 2009).

9 CONCLUSIONS

The aspect of mobile banking in developing countries considers the feasibility of mobile banking in developing countries. From the fact that M-PESA and Wizzit focused on the attributes of the unbanked, these are people with very low incomes. M-PESA did not bring up a solution for them to buy new phones but to instead use what they have. M-PESA used the existing technology that was common technology in all the phones utilized and on the market for purchase.

A conclusive comment is that for eBusiness to be feasible in the developing countries an additional channel known as the mobile phone was put in place. Mobile phone was the exact means to get eBusiness in the developing world by using a channel that had widely penetrated amongst the emerging markets.

Colonialism is an aspect to also rendering eBusiness feasible in developing countries. All infrastructures such as banks, roads, postal services; fixed-line telephone services railway and airline systems were established during the colonial leadership. Developing countries have made extensions and enhancements basing on the ideas of these infrastructures. For instance a joint venture between Absa and Wizzit is an extension and an enhancement.

Wizzit's compatibility enables it to work across networks. Its status of being an independent provider puts it in a position of not being tightly coupled to a network. Compatibility makes it flexible for any user on any network to send money to another person and vice versa. For the case of Safaricom non-users cannot send money to M-PESA users.

Transformational and Additive are two terms that describe the solutions to mobile banking. Wizzit has been able to yield to being transformational by

creating employment at the same time using unexploited human resource (unemployed young population). This unexploited human resource is mostly school dropouts, high school graduates, etc. Wizzit has embarked on matching the ICT technologies with the human resource by providing them with training on sales, acquiring new customers and technical support for the starter package. It is also described to be additive because it's an extra channel that complements with other existing channels for bank customers. M-PESA is purely transformational uses the existing distributive network of Safaricom agents plus its STK technology.

The social and governmental issues address the ways in which the banking solutions are put to use, factors influencing these mobile banking solutions and challenges hindering their progress.

In the scenarios the incidences reflect the absence of mobile banking by the involvement of informal banking methods thus making the problems inevitable. But the possibility statement gives a solution to rid out the informal measures being used.

The limitation during the research study was that the author could not find scientific articles and technical sources on Wizzit as a case study. All information to mobile banking was mainly focused on M-PESA. Only was the author able to find a source that was a Thesis research study addressing Wizzit as a case Study.

The result is M-PESA works with only Safaricom while on the other hand Wizzit has compatibility with any mobile operator. The other result is that both M-PESA and Wizzit are transformational mobile banking technologies at the sametime Wizzit is an Additive mobile banking technology. Wizzit can provide financial services to both the unbanked and existing bank customers. It can

be said the merits of Wizzit outweigh those of M-PESA which makes Wizzit better.

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