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**MOBILE MONEY CHALLENGES ON POLICIES, REGULATION
AND SECURITY FRAUDS IN EAST AFRICA**

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Abstract

Mobile monetary transaction services are engulfing in most of the developing countries predominantly east Africa and providing financial inclusion to large unbanked communities. Mobile money is an electronic carrier money that allows users and customers to deposit, withdraw, transfer, pay bill, top up and internet recharge through their mobile money system without carrying any hard cash. Mobile money has included large unbanked population in to the financial transaction system which banks have never reached. Though mobile money has changed the traditional way of financial transactions, there are challenges that the new electronic financial system is confronting. First policy, rules and regulations are non-existence as this machinery is embryonic to the commercial environment. Banks who are the ultimate money regulators comprehends the intensification of mobile money as threat to themselves and if they are not involved in the implementation, policy and rules of the currency it will get worse because the telecommunication network operators who run mobile money have no knowledge and experience the financial management. Moreover, governments which are also the definitive money controller are afraid this money transfer platform, because of the scarcity of financial inflation, money laundering, security and privacy vulnerability and terrorist transaction involvements. In all together, the mobile money are changing the traditional financial risk management requirements and transaction policy control environment. In this survey paper we highlighted the importance of mobile monetary transactions, policy, rules, regulations and challenges in the developing east African countries. The paper also outlines the potential security fraudsters and attackers.

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Keywords: Mobile money transfer; mobile monetary; network operator; financial inclusion.



1. Introduction

The cell phone mobile networks are heading to be the next technology generation of electronic money transfer and mobile money to mobile transfers. The primary goals of handset mobiles set by network telecommunication architectures are enlightening in to another utility by the technology progression to support new practical innovations for cell phone financial services (Merritt, 2010). Some of the mobile financial services are bill payments, person to person mobile account transfers, proximity and remote payments of good and service, prepaid and airtime, internet charges and personal mobile accounts connection to bank accounts where customers can credit and debit their cash money. Everybody knows that money is extraordinarily attractive to fraudsters and cypher attackers(Gaber, Gharout, Achemlal, & Pasquet, 2012).

There are a lot of challenges on mobile money to mobile transfer services, which are mostly implemented and used in the developing countries. First, mobile money to mobile transfers has changed the monetary policy environment without prior notice. Secondly, the policy, rules and regulations are non-existence as this machinery is embryonic to the commercial environment. The banks which are the ultimate money regulators comprehends the intensification of mobile money to mobile as a threat to themselves and if they are not involved in the implementation, policy and rules of currency will get worse because the telecommunication network companies who run the operation of mobile money to mobile have no experience to the financial transaction knowledge. Moreover, the governments which are also the definitive money controller are afraid this money transfer platform, because of the scarcity of financial inflation, money laundering and terrorist transaction involvements. In addition to that the customers have security concern over the use of money through mobile to mobile, because the platform is new and there are no pre-existed security policy, security models and security framework. This may allow the cypher criminals, fraudsters and attackers who have fresh eyes on this new platform to invade and disrupt the smoothness flow of the mobile money transactions.

This survey paper highlights the major challenges of mobile money to mobile transactions and outlines the potential security threats on mobile money to mobile transfer services.

The vestige of the work of this survey paper is structured as follows. Section 2 describes the survey papers' methodology; section 3.1 represents an overview and background history of the mobile money to mobile transfer in east Africa with the classification and comparison of East African Telecommunication network mobile money operator like Safaricom in Kenya, Vodacom in Tanzania and Telesom in Somalia. It also compares and contrasts the three company's customer outreach strategy, distribution strategy, business model and product strategy. Section 3.2 present some details on why mobile monetary transfer services banquet faster than the banks service while section 3.3 outlines Mobile monetary transfer service operation and section 3.4 summarizes the various aspects of mobile monetary transfer services including actors, service categories and technical infrastructure. In section 4 the author discuss Challenges on mobile monetary transfers including policy and security concerns and in section 5.1 we provide the potential security threats on mobile money transactions. In section 5.2 and 5.3 discuss why mobile financial security risks are more challengeable and the most common risks that mobile monetary transaction face respectively. In section 6 the author presents the finding of the survey paper while section 7 concludes the survey paper conclusion.

1.1. Mobile money to mobile transfers in East Africa

Every new technology that arises has a story behind its driving innovation, the introduction of mobile money monetary transfer is no exception. The mobile financial transfer service has a successful story that goes back to 2002, when a pilot test study on a mobile banking were carried out by the department of international development (DFID), UK,. The mobile banking pilot test was conducted in 20 small rural villages in Kenya. Four wheel drive vehicle acted as the mobile bank, moving from village to village and providing bank services to the villagers like saving and borrowing loans in order to motivate small existing business and encourage new ones (Ngugi, Pelowski, & Ogembo, 2010), and involve them the financial inclusion system which they have been exclusive for long period of time. This approach which was known as bottom of the pyramid was used to motivate economic activities in the remote poor areas of Kenya with the goal of improving the standard of living of the villagers and offering opportunities (Karnani, 2007) (Prahalad & Hart, 2005).

This portable mobile money entrepreneur was the first wave of mobile banking and mobile monetary transfer platforms. Because everything that four wheel drive vehicle was performing was the analog mobile banking discovery prior to the immense modernization of the digitalized mobile money transfer phenomenon (Ngugi et al., 2010)

Department of international development (DFID), UK, again took the lead in to another model experiment in the mobile phone platform rather than traditional mobile banking. This digital mobile money transfer gave the customers the chance to receive loans and pay it back to FAULU (a microfinance institution) through their handset cellphones, (Kenya Hughes & Lonie, 2007).

After observing the success of the mobile money platform by the market observers, they saw a business lucky chance and they reacted quickly and came up with the introduction of M-PESA. M-PESA officially introduced in 2007 by Safaricom (part of a group known as Vodafone), which is the largest telecommunication company in Kenya with the central bank of Kenya (William Jack & Suri, 2011). The software of M-PESA was developed by British company called SAGENTIA (Africa, 2014). Safaricom which is the largest leading telecommunication network operator company in Kenya, abbreviated M-PESA, M-mobile and PESA is a Swahili meaning money cash, together means mobile cash money (Jack, Suri, & Townsend, 2010). This was a historical technology event in Kenya, and many countries around the world particularly Africa and other developing countries followed the footsteps of M-PESA. Somaliland (South of Somalia) under the Telesom company, the largest communication network have sent observers to Kenya in order to study how M-PESA launched that mobile money to mobile financial transaction, in which in 2009 Telesom established Zaad service, a mobile monetary transaction system.

Comparing Saficom Kenya, Zaad Somalia and Vodacom Tanzania, the three most commonly used mobile monetary transfer services in east Africa outreach consumer policy, delivery plan, and business model and merchandise approach. In Safaricom Kenya, agents are the pillars that connect customers to the company, while Telesom Zaad merchants are pillars of the communication between customers and the company. In Vodacom Tanzania, aggregator scales the size for their network agent distribution which is directly connected to the customers. In merchandise policy Safaricom concentrate only on local, Vodacom concentrate on both P2P and paying bills, while Telesom zaad merchants and salary payers are the focus group. In business model Telesom provide the service free of charge, Vodacom charged a flat fee of 200

Tanzanian Shillings per transaction while Safaricom comply charges depend on the amount of money being transferred.

1.2. Mobile monetary transfer services banquet faster than the banks services

In general, prior to mobile monetary transfer introduction, banks categorize population in to banked and unbanked community. The unbanked population is more or less much more than the banked people, and in east Africa the banked population are most probably less than 20% (Kenya, 2011). There are a lot of obstructions that impede society from becoming banked society. First most people in east Africa are illiterate, which means they can't fulfil opening account, documentation requirements (Ngugi et al., 2010). Secondly, in banks there are bureaucratic procedures, rules and regulations that are entitled under Know your customer, including letter of introduction from the account holder, identification documents like passport, national identification card, picture of the account holder and certain amount of money as first deposit of your opening account. In addition to that in banks there must always be a certain amount of money remained in your account plus account activity follow up (Ngugi et al., 2010). If there are no transactions taking place in your account for limited months then your account would be suspended and opening it again will cost you money. In mobile monetary transfers, the operations are simple, when the customer creates mobile account by bringing any valid document during registration. After that the customer can use the service without any physical attendance.

1.3. Mobile monetary service operation

Mobile monetary transfer services are expanding extremely, particularly in the developing world and it is showing signs of future financial technology transformation. However, these kinds of network, internet and communication services need deep thinking strategies and there is security sensitivity. Everybody knows that money is extraordinarily attractive to fraudsters and cypher attackers (Gaber et al., 2012). Illegal funding and money laundering can also be used for this kind of mobile monetary transfer platform. Moreover, the mobile monetary transfer service companies to comply the government financial policy where ever the service is operating.

The way that mobile money transaction is transported, is virtualization transference conveying virtual money which is called money (Gaber, 2012). The service performs various types of transactions differing from buying goods and services, paying bills, sent money to person to person, paying and receiving salaries, airtime recharge and internet purchases. Some of the mobile monetary transfer service providers offer added value services to their customers, like assembling the mobile account in to your bank account, so that customers can credit and withdraw virtual cash to and from their bank accounts without physically going in to the bank location.

Mobile monetary transfer service allows customer to carry automated cash where they can accomplish their financial transactions (Basle, 1996). When the customer has physical cash money, he/she has to go the nearest agency or the service provider's sales stores. The customer will pay the physical cash and the sales store top up electronic digital money in to the customer's cell phone account. Both the customer and the sales store will receive message notification stating the amount money received by the customer and the amount the sales store has sent to the customer's cell phone.

The mobile account of the customer can also be referred to as virtual account, which is a branchless bank service (Mas, 2009) like the unbanked model (Timothy, 2006), carried out by communication network operators. The sole responsibility of the operations and the ownership of the mobile money transaction service platform belong to the telecommunication network company (Gaber, 12).

1.4. What are the various aspects of mobile monetary transfer services?

The following table summarizes the important aspects of mobile monetary transaction service are erected. There are three phases that take place during mobile monetary transfer service, within each aspect having its roles (Gaber et al., 2012).

Table 01. Phases and roles of mobile money transaction services

Phases	Role	examples
Actors	End user	P2P
	Service provider	Merchants and agents
	Channel distributor	operators
	Administrators	super administrator, network operator, customer care operator
transfer services categories	individual money transfer	Pocket money, remittance, person to person
	individual to company payment	Purchases, paying bills
	company to individual payment	Reimbursement and social benefits
	company to company payment	Suppliers
Technical infrastructure	Customer	Use Mobile through network
	channels distributors	Use web application
	system administrators	Use the internet

In general, there are pattern sequences that mobile monetary transactions services may take place. First of all the sender is authenticated, the MMT platform obtains the instruction of the payment and the facts of the transfer activities. That is followed by transaction possibility check and transaction approval. After that the sender receives message notification from the mobile money transfer platform. Then the transferred money is authorized to the receiver. Account of the sender is debited and the account of the receiver is credited followed by message reports sent from MMT platform to both the money sender and the virtual cash receiver (Gaber et al., 2012). This is a long process and it takes place in a matter of minutes which is a pleasure for the users and a privilege for the mobile operators. But there are a lot of questions concerning about the regulations, potential security threats and consistency of these huge transactions taking place day and night, without having any guarantee from a third party like the government or the central banks.

The scholars have inscribed a lot about the security attack and fraud from the internet transactions and mobile money transfers which are still connected to the internet. However, scholars haven't written anything about the mobile monetary transfer services like Zaad service which are operating in the third developing world. This survey paper presents the different views of Mobile Money transfer services.

In order to evaluate abnormal transfers the operator can go and find logs registered in the server log and the data warehouse. Personal identification number (PIN) modification, failed authentication, transferred request, successful transaction in the long can be used to detect events taking place in real time

which are related to simple fraud cases. Complex fraud cases and the behaviour of the customers can be analysed by using data warehouse which keeps the account histories (Gaber et al., 2012).

2. Problem Statement

Mobile money transaction services authentication security features are weak and susceptible to fraudsters and attackers because, the mobile money services uses only personal identification number (PIN) that consists of four digits. There are no combinations of letters and numbers and this makes the mobile money service vulnerable because the PIN can be guessed, shoulder surfed, shared, attacked and broke it easily. The mobile money transaction services identification and authentication method also consist of 10,000 combination and with advancement of the technology decryptions it can take few hours to break the PIN of the user. In addition to that there other challenges like hackers, fraudster, banks, government policy and regulations.

2.1. Challenges on mobile monetary transfer services

Apart from financial insertion to large quantities of unbanked communities comprising poor and remote rural area and supporting capital accumulation and household savings, the mobile monetary transaction services are changing money transmission policy and guidelines, financial transaction models and templates and rules and regulations of financial transaction environment.

According to (Adam & Walker, 2015) central banks have uttered deep apprehension of the risk of mobile money transactions undermining conventional monetary control system, which are included financial sector development and price stability

For example, in Kenya the banks have articulated anxiety that risk management requirements were not appropriate and compatible to mobile money transfers and Safaricom, the carrier of Kenyan mobile money were working outside of the money policy law. In addition to that Safaricom were interfering banks business. However the central bank of Kenya gave permission to M-PESA and Safaricom as a medium of money delivery platform, rather than money operator like banks. The central bank also allowed agents which were had no permission before M-PES establishment to deposit and withdraw money from cell phones to cash and from cash to electronic digits (Adam & Walker, 2015).

Another example, in Somalia, there is no central active banks, no policy makers, the market is free and Telesom Zaad service, another mobile monetary carrier in East Africa took a different route from Kenya. First they made an agreement with the government to launch the initiatives, after that they established their own stores and sales personnel. The stores provide the service of money deposit and money withdrawal, the personnel is operational zaad service employee and the company pays them salaries. They also allowed agents outside the box of Telesom to do the transactions on behalf of them in order to help them expand their Zaad service beyond their reach.

2.2. Potential security threats on mobile monetary transactions

There are a large activities relating to communication network environment that can be devoted to a mobile money transfer services. The second part of the survey paper summarizes the potential security threats, fraudsters and attackers on mobile money to mobile transaction. In mobile money industry, as the

mobile money transaction is recently released and as it is implemented in the developing world, there are no pre-existed policy, regulations and models that detect, secure or trace any potential threats.

As Subex suggested there are reasons to support the existence of risks and threats on mobile financial transaction services and why they are susceptible to frauds, some are mentioned below (Subex, 2011)

- There are exterior individuals like merchants, agents, subscribers, banks and retailers that take part the financial transaction of cash in-cash out.
- The simplification of the accessibility in anywhere any time makes this type of transaction services more eye-catching to the unethical elements
- Money laundering and terror funding can be easily used in this type of industry
- Telecommunication network owners who run this type of transaction lack the knowledge and experience of handling financial services

Mobile money to mobile financial transactions is new way to transferring the finances, the platforms that are used for transaction are embryonic and the various types of frauds and attackers are increasing in number. Some of the possible frauds schemes on mobile money transfers are mentioned below (Omuga, 2014)

- Schemes targeting consumer market
- Business targeting schemes
- Internal fraud schemes
- And channel fraud scheme

In everyday news there are stories about mobile payments and mobile money to mobile transferences related to security issues (Pegueros, 2012). Though the mobile money payments are the next big thing in technology, there are security anxieties for both mobile finance services providers and the consumer. The security risks are at high level, because of the complex supply chain, the new competitors and the new technology. The traditional security controls like antivirus, firewall and encryptions are not compatible for securing mobile money to mobile applications.

3. Research Questions

1. What are the weakness of mobile money transaction service authentication system?
2. What are the various aspects of mobile monetary transfer services?
3. What are the challenges that mobile money transaction service confront?
4. How the governments, banks and telecommunication mobile money operators work together?

3.1. Why mobile financial security risks are more challengeable

Mobiles are portable and prone to lost and theft

Mobiles belongs to individual in which they use it in more personal and confidential way

There are no reliable mature security tools, controls, rules and regulations

3.2. The common risks that mobile monetary transfers face

There different types of fraudsters in mobile money transfer services including mobile money customer data theft, mobile monetary transfer service technical attack, internal mobile operator fraudsters

and business partner imposters, subscription imposters, commandeering personal accounts, laundering money, miscellaneous and others. Social engineering, malware for PC, malware for mobiles, masquerade of company officials for phishing are the exemplary of stealing mobile customer data while near field communication fraud, interception of transmission data, attack on mobile money and denial of service are the good illustrations of practical bout on mobile monetary transfer services. Exchange of SIM, mobile monetary account MSISDN (mobile station international subscriber directory number) alteration and mobile money service frauds are specimens of account takeover and fraud subscriptions respectively. Business partner and mobile operator internal imposters are included but not limited to dummy account and commission fraud, subject verification, applying credit/discount, corrupt dealer or remittance agents, deception by member in outsourced business partner, customer data reselling, service level un-authorization, provisioning services directly to a network element. SMS spoofing authorization, handset steeling, transferring fund to a wrong number intentionally are examples of miscellaneous while internal and external risks are the exemplary of money laundering.

4. Purpose of the Study

The purpose of this survey study is to know the weaknesses and challenges of the mobile money transaction services. The paper covers the personal identification number (PIN) weaknesses and the problems that the telecommunication network companies confront by handling this business. The paper also focus the internal and external challenges that mobile money transaction service companies, governments and banks are dealing with. Because this niche business market evolve in the middle of nowhere and neither of these stakeholders were prepared.

5. Research Methods

In this survey paper, we used case study as our reach method because the researcher hasn't performed any pilot test or any data collection methodology as there is no information from primary data collection resource. There are several categories of case study including exploratory, descriptive and explanatory. We selected descriptive case study as the researcher's survey paper methodology because of the different strategies being used by telecommunication network operator and the narratives of the description of the data being assessed relating to mobile money transfer services. The descriptive case study can be both qualitative and quantitative and the papers, case studies and journals that the researcher went through to observe, analyse and study during the groundwork of this survey paper is all based on descriptions of the mobile money financial transaction services. Descriptive theory was used to examine the depth and the scope of the mobile money transactions service and their telecommunication network operators' carrier.

6. Findings

Papers have written a lot about the rise of new technology in east African mobile money transfer operations like Safaricom and Vodacom, but little have written from Telesom Zaad service, the world leading mobile monetary transaction from personal to personal transaction. Scholars have investigated in many aspects of this new technology innovation in order to enlighten the pros and cons and many other aspects that may cut the traditional ways of transactions. Researchers have also mentioned that these new

technology implementations have saved a lot of time, cost and have their own traces like printing daily transactions or going to the telecommunication network agencies or stores to print customers to any transactions that they request. The most scholar documentation focuses on internet banking, mobile money transfer and mobile banking.

Comparing companies like Safaricom, Vodacom and Telesome have used different customer outreach strategy, distribution strategy, business model and product strategy. For example Vodacom and Safaricom charge on very transaction that takes place while Telesom Zaad service the transaction service is free, Vodacom use aggregator to scale the size of their network transaction coverage while Telesom use merchants and salary payers in order to reach customer transaction inclusion.

Mobile money to mobile transfers performs numerous forms of transactions comprising from buying goods and services, paying bills, sent money to person to person, paying and receiving salaries, airtime recharge and internet purchases. Some of the mobile monetary transfer service providers offer added value services to their customers, like connecting the mobile account in to their bank account, so that customers can cash in/cash out from their bank accounts without physically going in to the bank location. These kinds of operations are increasing rapidly and every time there are new transfer services for the customers.

There are a lot of challenges that are confronting the telecommunication network operators who are running the mobile money to mobile transfer services varying from country to country. For example in Kenya and Tanzania the customers can transfer limited amount of money through the mobiles and most people don't use the mobile money transfer service as treasure, people use the system for transactions only particularly P2P. In another example in Somalia, people can transfer huge amount of money with no limitation according the capacity of the holders mobile, they can also keep their money on their mobile as long as they want. In addition to that the governments are pressurizing the telecommunication network operator for being afraid that the service may cause inflation and it may be used for other purposes like money laundering and terroristic transaction. Moreover there are some big security concerns on this embryonic financial transaction services because the devices are being used are relative small and portable. Some of the biggest mobile scheme frauds are those targeting consumer market, business target, internal fraud scheme and channel fraud scheme.

7. Conclusion

In all together, in any case from any country particularly East Africa, the mobile money transactions are altering money policy environment for a major economy in east Africa. They are shifting the traditional financial risk management requirements and transaction policy control atmosphere. The central banks are presenting more flexibility because they see the mobile money transfer as an advantage for the financial inclusion to the poor and remote population. They are also making financial policy assessment and amendments in order to make sure the customer's transactions are safe. Although Somalia is an exception from this adaptation, assessment and amendments because of the lack of central government and central bank, the mobile monetary transfer are leading the economic growth and financial inclusion to the most needed community as a sign of positive.

There are security potential threats on using mobile money to mobile transfers and these security threats, fraudsters and attackers on mobile money are much more series than previous technology threats.

Because first, mobiles are simply portable and prone to lost and theft, secondly, there are external individuals who are involved in the electronic-hard cash in and cash out exchanges. In addition to that the telecommunication network operators have no financial background expertise money laundering and terror funding can be used. Finally, rules, security tools, security controls and policy regulations are not reliable as this financial technology is embryonic. But in general there is a positive sign because the telecommunication network operators, the central banks, the customers and the government who has the final say are all striving together in order to improve the smoothness flow of mobile money transaction service and enhance the threats that may hinder the continuity of the service operation.

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