

MOBILE COMMERCE: MOBILE MONEY TRANSFER IN GHANA (CUSTOMERS' PERSPECTIVE)

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Abstract:

Mobile money transfer allows people to send money using Short Message Service (SMS). Its low costs, fast speed and no need of having a bank account. The service started in Kenya as MPESA introduced by Safaricom and has since been replicated in other parts of the world especially in developing countries. The service was introduced in Ghana in 2009. Much research has been done in mobile money transfer but mostly focused on the success of MPESA. Very little is known with respect to the service in Ghana. This paper studied the use of mobile money transfer service in Ghana from the customers' perspective. The study sought to compare the extension and impact of the service as against the successful implementation of Kenya's MPESA. The objective was to investigate the socioeconomic characteristics of MMT users, and their MMT experience. Quantitative and qualitative research method based on the Positivism and the Interpretivism philosophies were used. The survey method using questionnaire was used. The mobile money transfer processes, as used in Ghana, was modelled. The result of the survey showed that MMT was used to a large extent in Ghana, just as in Kenya; it was concluded that like the survey by Mas & Radcliffe, (2010) which found that 98 percent of users in Kenya were happy with the service, the users in Ghana were equally happy, however, the percentage in Ghana was 88%.

Keywords: Ghana, Mobile Commerce, Mobile Money Transfer, Mobile Network Operators, Kenya, MPESA

1. INTRODUCTION

In its December 2010 issue, the Economist gave the award for social and economic innovation in 2010 to the founders of M-PESA, Kenya's pioneering mobile money-transfer service. As explained by Mas & Radcliffe, (2010), in the article *Mobile Payments go Viral : M-PESA in Kenya* published by the Bill and Melinda Gates Foundation, M-PESA was developed by mobile phone operator Vodafone and launched commercially by its Kenyan affiliate Safaricom in March 2007. M-PESA ("M" for mobile and "PESA" for money in Swahili) is an electronic payment and store of value system that is accessible through mobile phones (Mas & Radcliffe, 2010). According to Mas & Radcliffe, to access the service, customers must first register at an authorized M-PESA retail outlet. They are then assigned an individual electronic money account that is linked to their phone number and accessible through a SIM card-resident application on the mobile phone. Mas & Radcliffe explain that customers can deposit and withdraw cash to/from their accounts by exchanging cash for electronic value at a network of retail stores (often referred to as agents). These stores are paid a fee by Safaricom each time they exchange these two forms of liquidity on behalf of customers. Once customers have money in their accounts, they can use their phones to transfer funds to other M-PESA users and even to non-registered users, pay bills, and purchase mobile airtime credit. All transactions are authorized and recorded in real time using secure SMS.

M-PESA is growing from strength to strength; Safaricom reached the 9 million customer mark in under three years (Mas & Radcliffe, 2010). The survey by Mas & Radcliffe, (2010) also found that 98 percent of users reported being happy with the service and 84 percent claimed that losing M-PESA would have a large, negative effect on them.

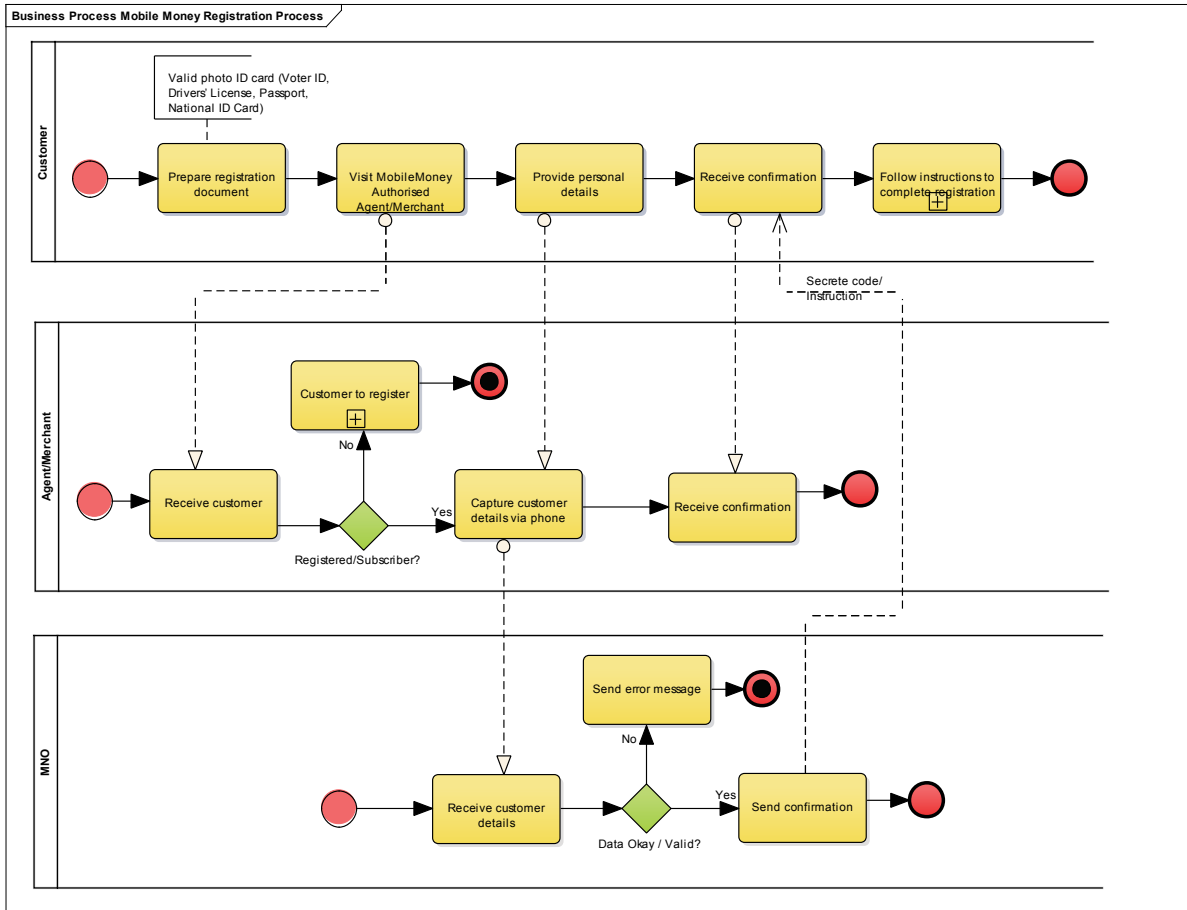
The GSM Association in their 2009 annual report (GSMA, 2010) reported that M-PESA is the most widely adopted mobile money deployment in the world. There are several other researches that have been done on the success of M-PESA including *Mobile Money: The Economics of M-PESA* by Jack & Suri, (2011), *Three keys to M-PESA's success: Branding, channel management and pricing* by (Mas & Ngweni, 2009), *Seeking Fertile Grounds for Mobile Money: M-PESA is a huge success... and now what?* By Heyer & Mas, (2009), as well as so many others.

The success of M-PESA has stimulated the creation of many similar schemes in developing countries like Ghana; where the global trend in terms of increase in Mobile-broadband subscriptions is no different. There has been increased Mobile-broadband subscription as well the number and market share of mobile network operators in Ghana over the years. As at the time of the research, there were six MNOs in Ghana. Out of these, the Ghana National Communication Authority, NCA, 2015 reports that Scancom (MTN) had about 47.37% of the market share of the telecom data subscription, Vodafone's market share was 13.90%, Airtel had 19.57%, while Expresso owned 0.42%. The market share of the new entrant, GLO stood at 2.86%, while that of Tigo was 15.89%.

This trend has accelerated mobile commerce and therefore mobile money transfer in Ghana. Mobile money transfer service allows people to send money to others using Short Message Service (SMS). Its low costs, fast speed and no need of having a bank account let this service grow very fast in Ghana.

The process model below depicts how a person can register and subscribe to mobile money transfer in Ghana.

Figure 1: A Process Model Showing Mobile Money Registration Process.

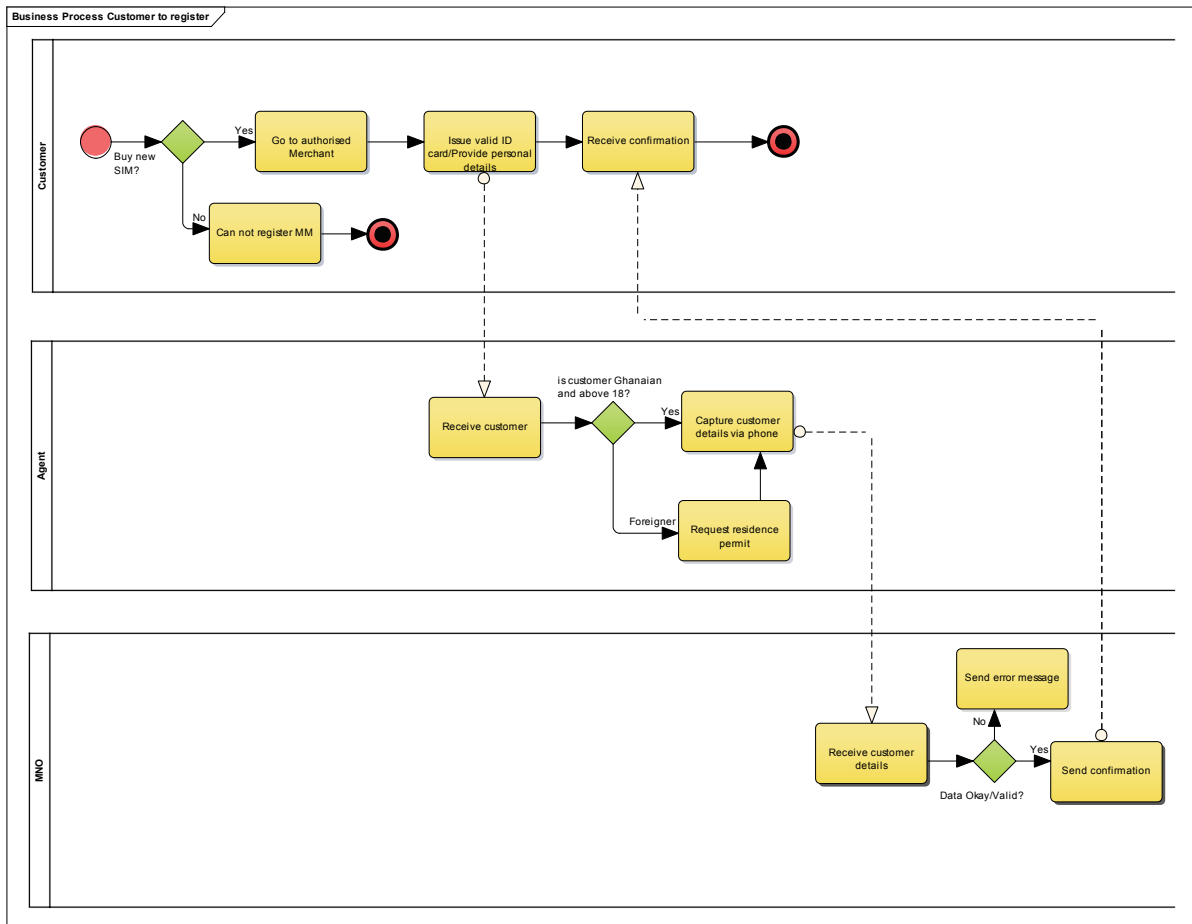


(Source: Own Representation)

With a valid photo ID card (Voter ID, Drivers' License, Passport), customer will go to the nearest Mobile Money Authorized Merchant, the Merchant captures his/her personal details and provides a Mobile Money SIM card (if he/she is not an existing customer, see figure 2). The customer then goes through the registration process.

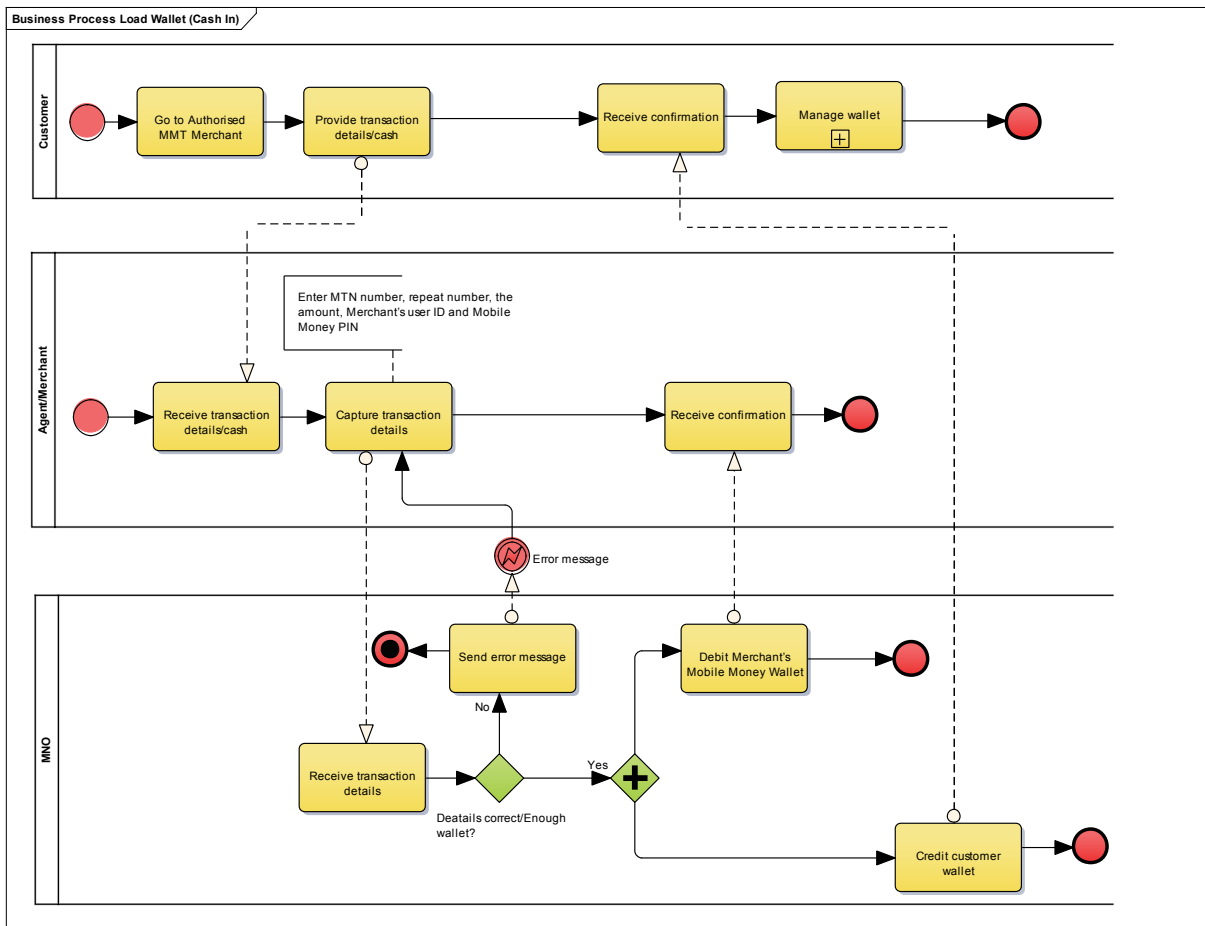
From figure 1 above, if the person is not an existing customer, he/she will have to register for a new SIM card. The process for such is shown by the process model shown in figure 2 below.

Figure 2: A Process Model Showing New Customer registration Process. (Source: Own Representation)



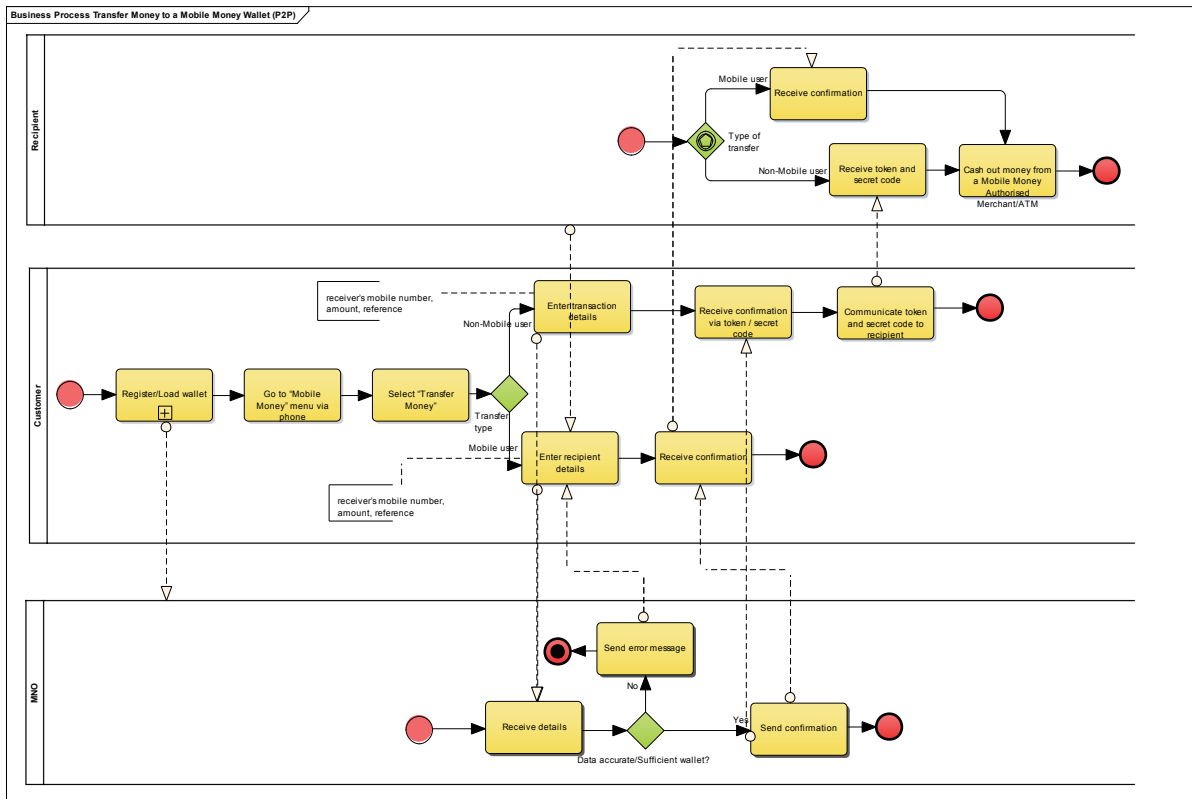
Mobile money transfer has transmogrified over the years from simple person to person (P2P) money transfer to such services as Cash-in/Cash-out where mobile money service is used as a means of saving/depositing and withdrawing just like the regular bank account. To send money via Mobile Money Transfer, the customer will have to first load his/her mobile money wallet. This process is shown by the process model shown in figure 3. The customer would have to go to the nearest Mobile Money Authorized Merchant, he/she hands over cash to Merchant, the merchant enters his/her mobile number, repeats the number, the amount, and the Merchant’s user ID and Mobile Money PIN. The Mobile Network Operator will debit the Merchant’s Mobile Money Wallet and credit the customer. The customer immediately receives a confirmation message of the successful loading.

Figure 3: A Process Model Showing how to Load Mobile Money Wallet. (Source: Own Representation)



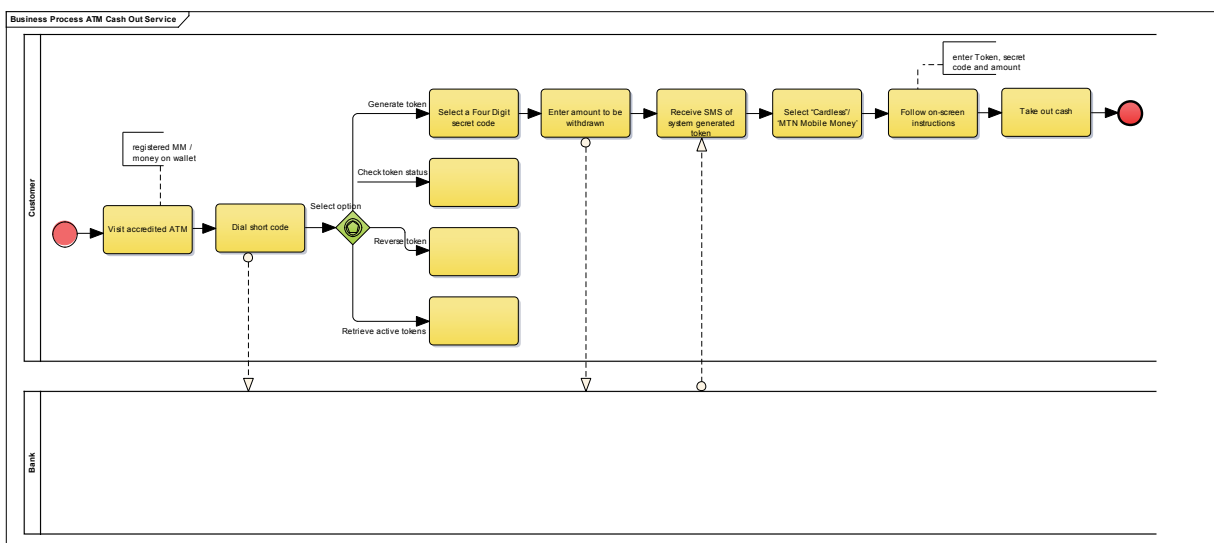
With enough mobile money wallet, a customer can begin any transaction including transferring money to another person via the Mobile Money Wallet (P2P). The process model for such a transaction is shown in figure 4.

Figure 4: A Process Model Showing how to Transfer Mobile Money via P2P. (Source: Own Representation)



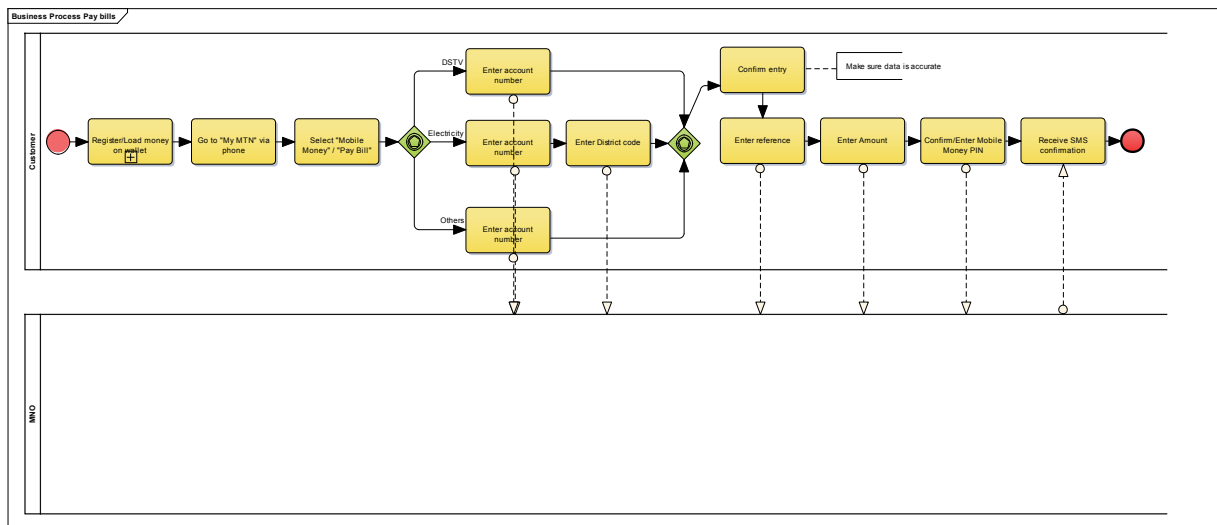
As shown in figure 4, the customer will have to make sure he/she has sufficient money in his/her Mobile Money Wallet. Go to “Mobile Money” menu, select “Transfer Money” and “Mobile User.” He/she enters and repeat receiver’s mobile number, amount, reference, confirm details and enter Mobile Money PIN. If the recipient is not a mobile money subscriber, the option is to 2 select “Transfer Money” and “Non Mobile User.” The customer enters amount, secret code, repeat secret code, confirm details and enter Mobile Money PIN. He/she will receive via SMS a token (a 12-digit serial number). He/she communicates the token and secret code to the receiver to cash out the money from a Mobile Money Authorized Merchant or via ATM, whose process in depicted by the process model shown in figure 5.

Figure 5: A Process Model Showing ATM Cash-out Process. (Source: Own Representation)



Mobile Money Transfer can also be used for bill payment which serves as a means of paying utility and other bills. The process model shown in figure 6 below shows this service.

Figure 6: A Process Model Showing MMT Bill Payment Process



Innovation and expansion characteristic of Mobile Money Transfer in Africa, and for that matter Ghana, is so great that recent services include what is called “KwikAdvance”. According to MTNGhana, (2015) this service provides salary advance for employees through their Mobile Money wallets to meet emergencies such as school fees, utility bills, medical bills as well as any other financial obligations anytime during the month when their regular salary is not due.

Out of the six MNOs in Ghana, MTN, Airtel, and Tigo offer Mobile money transfer service. The fourth provider, TXTnPay with other emerging providers are not widely known. It is important to mention that, Vodafone, after five years staying away from the Ghanaian mobile money transfer market, has recently launched the service in Ghana.

From the arguments put above, it is clear that mobile money transfer has taken seed in Ghana. What is missing is the point that very little is known with respect to the service in Ghana. This paper focuses on the use of mobile money transfer service in Ghana. The study seeks to compare the extension and impact of the service as against the successful implementation of Kenya’s MPESA (Jack & Suri, 2011). The paper will investigate the socioeconomic characteristics of MMT users in Ghana and their MMT experience.

1.1. Problem Statement

Transferring money has been part of the socio-economic development of Ghana. Money is transferred for so many reasons; pay bills, as remittance, for trade, and among others. Remittance is one of the major reasons of transferring money in Ghana. Ghana, like most other developing countries has a high rate of migration. It is common to find the bread winner of most households residing in urban centers with the rest of the family in the rural areas. Most of their (migrants) siblings find themselves in schools (or other form of training) in urban cities. Migrants are misconceived to have a relatively higher standard of living than rural and/or non-migrants and therefore culturally obliged to remit the family and take care of the siblings on regular basis if not at the end of every month.

Other reason for transferring money is the fact that there are high percentages of students who are temporary resident in locations away from their regular homes. Money transfer is often used to send and receive money from parents/guardians and other well wishers.

In Ghana, the most common channel for transferring money before the introduction of MMT was informal means by travelers and bus drivers. These informal and unlicensed means resulted in considerable risk that the money will either not reach its final destination or had some “stories” in the form of deception associated. The Government owned postal service as well as private companies, mainly banks, introduced formal remittance services which were intended to avert the risks of informal methods. However, these interventions are perceived by customers as costly, slow, or ineffective. An example is a lamentation of Stephen A.Quaye, a Ghanaian resident in Toronto-Canada as appeared

in Ghana web as a feature article (Quaye, 2011). Other articles such as (Adjetey, 2005) and (GGB, 2013) point to the ineffectiveness of the Ghana postal system. Following the success of MPESA in Kenya, this research seeks to ascertain how successful the MMT model is in Ghana by looking at the socio economic impact of the service among Ghanaian households.

2. Literature Review

This chapter presents relevant review of literature related to Mobile Money Transfer in Ghana. It outlines what is known and not known about the Mobile Money Transfer in Ghana. Saunders, Lewis, & Thornhill, (2009) explain that the literature sources available to help to develop a good understanding of, and insight into, previous research can be divided into three categories: primary (published and unpublished), secondary, and tertiary. In this research, primary, secondary, and tertiary sources were used to find literature. All three sources were selected as a result of the presumption by the author that not much research has been done and published on the topic. The reason may be attributed to the fact that mobile money in Ghana is a recent service and in the infant stage of development. There was therefore the need to broaden the scope of the search.

2.1. Related Indicators and reports

This section is intended to bring to the fore some mobile reports regarding mobile telephony in Ghana. It is equally important to compare the situation in Ghana with that of the Kenya since Mobile Money Transfer in Kenya has been considered as the forerunner.

Ghana is one of the leading countries in West Africa, a member of the Sub-Saharan African (SSA) sub-region. West Africa is made up of 16 countries with a combined estimated population of 312 million. The largest countries are Nigeria and Ghana, accounting for 60% of total population in the sub-region.

As at 2012, the total population of Ghana stood at 25,546,000 against 42,749,000 of Kenya (ITU, 2013b). It is clear that Kenya has a higher population more than that in Ghana. This analysis is important because it would help to articulate various mobile analyses in reference to the number of people in both countries relative to Africa and the world as a whole. It would also help to clearly understand the various mobile indicators between the two countries as highlighted below.

According to GSMA, (2012b) while SSA has only 8% of worldwide mobile connections, it has seen the highest rate of growth worldwide. Since 2000, the number of connections in SSA has grown by 44% (and in Africa as a whole by 43%), compared to an average of 34% for developing regions and 10% for developed regions. GSMA, 2012 explain that seven out of the 10 fastest growing countries in the world are located in SSA, and mobile connections are expected to increase significantly in the medium term.

Similar to most African countries, Ghana and Kenya have different MNOs in operation. There are six MNOs in Ghana and four in Kenya. Vodafone operates in both Ghana and Kenya. However; Vodafone operates under the name Safaricom in Kenya.

The total mobile-cellular telephone subscriptions for Ghana as at 2012 was 25,618,000 with a total of 30,732,000 in Kenya (ITU, 2013b). According to the Handbook for the collection of administrative data on Telecommunications/ICT of the International Telecommunication Union (ITU, 2011), mobile-cellular telephone subscriptions refers to the number of subscriptions to a public mobile-telephone service that provide access to the public switched telephone network (PSTN) using cellular technology. The International Telecommunication Union (ITU, 2011), explain that the indicator includes (and is split into) the number of postpaid subscriptions, and the number of active prepaid accounts (i.e. that have been used in the two countries during the last three months). ITU further explain that the indicator applies to all mobile-cellular subscriptions that offer voice communications. Furthermore, it excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and telemetry services. The trend has been increasing for both countries since 2002 with Kenya having the greater subscriptions over Ghana.

It is interesting to note that despite the high mobile-cellular telephone subscription in Kenya, perhaps as a result of the higher population, Ghana has higher mobile-cellular subscriptions per 100

inhabitants than Kenya. Ghana has 100.28 mobile-cellular subscriptions per 100 inhabitants higher than 71.89% of Kenya (ITU, 2013b). This indicator ascertains the level of mobile development in a country and is obtained by dividing the total number of mobile cellular telephone subscribers by the total population and multiplying by 100. Therefore, comparatively (taking hundred people) Ghana has more people with access to mobile phones than in Kenya. However, Kenya has higher mobile population coverage than Ghana. This means that the percentage of the total population covered by mobile network operators in Kenya is higher than those in Ghana. This is understandable considering the higher population of Kenya than Ghana.

On the domestic mobile-telephone traffic, in 2007, Ghana had higher domestic mobile-telephone traffic than Kenya. This means that the total number of minutes of calls made by mobile subscribers within Ghana, including the total minutes of call to fixed-telephone and total minutes of call to mobile-phone subscribers, was higher. This however reduced along the years with Kenya having a more traffic than in Ghana since 2010. This is also understandable looking the higher subscription and coverage in Kenya than in Ghana.

In contrast to the domestic mobile traffic, according to GSM Association in their 2012 Sub-Saharan Africa Mobile Observatory (GSMA, 2012), Ghana has a higher mobile spectrum than Kenya. The extent and availability of mobile spectrum depicts how successful the development and operation of mobile broadband is in a country. However, as shown in figure 12 below, the amount of spectrum allocated to mobile services in Africa is currently among the lowest worldwide, with some countries allocating as little as 80MHz and many between 200MHz and 300MHz (GSMA, 2012).

GSMA, 2012 further explain that everyone across the globe should have access to mobile broadband which should come at a reasonable cost and at the same time with dependable performance. GSMA agreed that governments around the world have embraced this goal and championing effect to that direction. Furthermore, success depends largely on the supply of spectrum made available for mobile services. Without sufficient spectrum, the mobile industry cannot deliver a rich and dynamic mobile future for all.

Quantitatively Kenya sends more SMS than Ghana. In 2004, a total of 153,000,000 SMSs were sent, 355000000 in 2005, 256 000 000 in 2006, 445 000 000 in 2007, 2 056 000 000 in 2008, 2 261 000 000 in 2009, 2975 in 2010, and 3611 in 2011. This means that the total number of mobile short-message service (SMS) messages sent, including those to national and international destinations composed on, and sent from, a mobile handset to another mobile handset are more in Kenya than in Ghana. This trend is interesting considering the differences in population between the two countries. It would therefore be important to consider the number of SMSs per hundred inhabitants. This would clearly show the extent to which the two countries utilize SMS.

Between 2003 and 2006, it was more expensive to make one minute of call on peak in Kenya than in Ghana. And still, between 2008 and 2012, it was cheaper in Ghana than in Kenya. From Table 1, it can be concluded that it is now cheaper to make a call in Ghana on peak than in Kenya.

Table 1: Mobile-cellular prepaid 1-min call (peak, on-net) in Kenya and Ghana.

Mobile-cellular prepaid–1-min call (peak, on-net)/ US Dollars										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Kenya	0.38	0.35	0.33	0.33		0.16	0.09	0.09	0.05	0.05
Ghana	0.11	0.08	0.08	0.06		0.06	0.06	0.06	0.04	0.04

Data source: (ITU, 2013a)

The trend for off peak calls was not different until 2011. Between 2003 and 2006, it was more expensive to make one minute of call off peak in Kenya than in Ghana; as high as \$0.27 in Kenya against \$0.08 in Ghana. However, between 2011 and 2012, it became cheaper in Kenya than in Ghana. In 2012, it cost \$0.02 for a minute of off peak call against \$0.04 in Ghana. From Table 2, it can be concluded that it is now cheaper to make an off peak call in Kenya than in Ghana.

Table 2: Mobile-cellular prepaid 1-min call (off peak, on-net) in Kenya and Ghana.

Mobile-cellular prepaid–1-min call (off-peak, on-net)/ US Dollars									
	2003	2004	2005	2006	2008	2009	2010	2011	2012
Kenya	0.27	0.27	0.19	0.33	0.16	0.09	0.09	0.02	0.02
Ghana	0.08	0.05	0.05	0.06	0.04	0.04	0.04	0.04	0.04

Data source: (ITU, 2013b)

According to GSMA, 2013, Ghana has a mobile penetration rate of 63% in the urban centers against 30% in the rural areas. This is in agreement with the International Telecommunication Union's 2013 report on measuring the information society which ranked Ghana as the country with the highest mobile penetration rate of 34 per cent in Africa (ITU, 2013a). The increase in the mobile penetration rate has catapulted the competition among MNOs in Ghana as reported by the GSMA Intelligence. According to (GSMA, 2013), Mobile operator competition in Ghana is keenly contested and ranked 6th below Rwanda, Mexico, China, Kenya, and South Africa.

2.2. MPESA

Regardless of the inadequate research on Mobile Money transfer in Ghana, there have been extensive studies of the service in Kenya relating to MPESA. It is therefore important to review a sample of these studies. The general perception is that MPESA has been a success and a benchmark. M-PESA was developed by mobile phone operator Vodafone and launched commercially by its Kenyan affiliate Safaricom in March 2007 (Mas & Radcliffe, 2010). M-PESA is the concatenation of "M" for mobile and "PESA" for money in Swahili language. Similar to MMT operation in Ghana, MPESA is an electronic payment and store of value system that is accessible through mobile phones.

3. METHODOLOGY

The research used both the quantitative and the qualitative methods. These methods were chosen as a result of the Positivism and the Interpretivism philosophies adopted for the study. The positivism philosophy is more inclined to quantitative method while the interpretivism philosophy is more related to qualitative method. Again, beside the quantitative method, the qualitative method allowed the identification the true characteristics of respondent related to various social factors. The data was collected from the respondents' own point of view as such the researcher has no influence in the result. Such a procedure on one hand will make collection results in numerical and standardized data.

The research strategy was the survey strategy. The reason for the survey strategy was that it is usually associated with the deductive approach in which this research to a large extent bases. The survey strategy, according to Saunders et al., (2009), is a good strategy to answer who, what, where, how much and how many type of questions which were characteristic of this research. The sample for the research was taken from some communities in the Ashanti region of Ghana. The communities were Ahenkro, Offinso, Buoho, and Kodie. These communities were selected to have a better representation and not to restrict the research scope to only one community. These communities can be described as urban poor.

4. DISCUSSION

4.1. Socioeconomic characteristics of respondents

There were more male users (68%) of MMT than female users (47%). This was characteristic of the Ghanaian population demographics as the 2010 population and housing census of Ghana gave Ghanaian males as more economically active and is better to be employed; therefore they stood a better position to earn more money than their female counterparts. Again the chance of the Ghanaian female being unemployed was higher than the males.

In terms of MMT, the elderly sent mobile money to their younger counterparts. It was found that 39% of the respondents were in the age group 26 – 30, none was below 18, 23% were in 18 – 25, 20% in 31 – 35, 6% 36– 40, 5% in 41- 45, 5% 46 – 50 with only 2% above 51. This was expected considering the fact that the elderly were assumed to be more economically active than the young. Young Ghanaians below the age of 18 are predominantly in school or other training centers and are therefore

economically unproductive, unemployed, and needed to be supported by their productive elders. Besides young Ghanaians, mobile money was sent to people who were above 50 years. This was also expected considering the fact that these people are usually retired and unproductive.

Formal workers (60%) used more mobile money than their informal counterparts (40%). Again, the educational level of the formal senders was higher than the educational level of the corresponding recipient. The flow of MMT came from people with higher education to those with lower education. There were more senders from Master's and bachelor degrees holders than recipients of the same educational background. The ratio of senders to recipients for the master degree level was 9:0, and 32:10 for bachelors' degree holders. In contrast, there were more recipients at the lower level educational category where SHS and JHS recipients were more. Whereas there were no JHS and SHS senders, 27 recipients were in JHS with 23 in the SHS category. Again, this result was reflective of the population demographics of Ghana as the active and productive class was those with higher form of education and therefore they were in a better position to support the young and unproductive class. This was also expected since the formal senders have a regular source of income than the informal senders.

Siblings were more recipients of mobile money in Ghana; mothers received more mobile money than fathers; and spouses received more mobile money than children. MMT is used to a large extent in Ghana, just as in Kenya, as more and more people use the service more than thrice in a month. Again, unlike most countries in Africa, there were more bank accounts holders in Ghana meanwhile account holders preferred to use MMT than through banks. Like in Kenya, the popularity and use of mobile phones in Ghana was widespread and reflected the global statistics of mobile phone use; 90% of household owned and could use mobile phone

4.2. MMT operation

These MMT products were used in Ghana; Cash-in/Cash-out, P2P, Bill Payment, Airtime Top-up, Merchant Payment, and Bulk Payment. Of these products Cash-in/Cash-out (75%) was the most popular and often used product while merchant and bulk Payment was the least used products. Unlike in Kenya where M-Ticketing is widely used, the service was not widespread in Ghana.

The registration/subscription process to MMT was mixed; a greater percentage of users had no difficulties in registering/subscribing to the service. However, the same percentage likewise had difficulties. The ratio was 55:48 and therefore it can be concluded that the registration/subscription process was quite mild, however, more efforts needed to be put in place by MNOs in Ghana for effective MMT.

Withdrawing money with MMT in Ghana was instant and therefore quite good. However, there were still challenges which should be addressed by the MNOs. Customers were to some extent satisfied with MMT agents. The conclusion here was that like The survey by Mas & Radcliffe, (2010) which found that 98 percent of users in Kenya were happy with the service, the users in Ghana were equally happy, however, the percentage in Ghana was 88%. Therefore, the GSM Association in their 2009 annual report (GSMA, 2010) which gave M-PESA as the most widely adopted mobile money deployment in the world is still valid. It must be emphasized that MMT in Kenya started in 2007 while Ghana started the service in 2009. It therefore hoped that the percentage would increase with the passage of time.

Unlike Tobbin, (2012) findings which noted that despite the appearance of MNOs in Ghana, these schemes had remained largely unnoticed by Ghanaians, there was high usage of the service. However, Tobbin's survey focused on the rural dwellers while this paper had focus on the urban poor. The deduction was that MMT was popular in urban centers more than among the rural dwellers.

Unlike GSMA, (2012a) who reported the lack of cross-net transfer functionality in most MMT deployments, cross-net was used in Ghana to a large extent and the main reason was that the recipient was affiliated to a different network. Again, as stated by GSMA that the introduction of interconnection serves as a motivation through which existing customers may start making cross-net transfers, there was a general agreement that interconnection would create value in MMT operation in Ghana.

Some of the reasons for the non-use of MMT in Ghana were Complex procedures, delay in withdrawing money, inadequate agents/point of registration, and distrust. Others were inadequate advertisement and illiteracy. On top of the list was inadequate agents/point of registration.

REFERENCE LIST

1. Adjetey, D. (2005). Our Postal System- Which Way Forward? Retrieved October 09, 2013, from <http://www.ghanaweb.com/GhanaHomePage/features/artikel.php?ID=94731>
2. AirtelGhana. (2013). Airtel Money. Retrieved May 16, 2013, from http://www.africa.airtel.com/wps/wcm/connect/africaairtel/Ghana/AirtelMoney/What_is_Airtel_Money/
3. BOG. (2002). Major Payment Systems in Ghana. Retrieved May 16, 2013, from http://www.bog.gov.gh/index.php?option=com_content&view=article&id=100&Itemid=146
4. BOG. GUIDELINES FOR BRANCHLESS BANKING (2008). Ghana: Bank of Ghana.
5. BOG. (2011). Bank Of Ghana Annual Report.pdf. Accra-Ghana: Bank of Ghana. Retrieved from www.bog.gov.gh
6. GGB. (2013, September). Ghana Post strategising to revive dwindling fortunes. *Ghana Web*. Accra-Ghana. Retrieved from <http://www.ghanaweb.com/GhanaHomePage/business/artikel.php?ID=286645>
7. GSMA. (2010). *GSMA Annual Report 2009*. International Food Policy Research Institute. doi:10.2499/9780896297852
8. GSMA. (2012). *Sub-Saharan Africa Mobile Observatory 2012*. London. Retrieved from www.gsma.com
9. GSMA. (2013). *Scaling Mobile for Development Harness the opportunity in the developing world*.
10. Heyer, A., & Mas, I. (2009). Seeking Fertile Grounds for Mobile Money. *Bill & Melinda Gates Foundation*, (September), 1–22.
11. ITU. (2011). *Handbook for the collection of administrative data on Telecommunications/ICT*. Geneva. Retrieved from <http://www.itu.int/en>
12. ITU. (2013a). *Measuring the Information Society*. Geneva. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2013.aspx>
13. ITU. (2013b). *World Telecommunication/ICT Indicators database 2013 (17th Edition)*. Geneva. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>
14. Jack, W., & Suri, T. (2011). *Mobile Money: The Economics of M-PESA*. Massachusetts. Retrieved from <http://www.nber.org/papers/w16721>
15. Mas, I., & Ngweni, A. (2009). Three keys to M-PESA 's success: Branding , channel management and pricing. *Bill & Melinda Gates Foundation*, 1–26.
16. Mas, I., & Radcliffe, D. (2010). Mobile Payments go Viral: M-PESA in Kenya. *Mobile Payments Go Viral: M - PESA in Kenya, (March)*, 1–27., (March), 1–27.
17. McGrath, F. (2013). *Mobile Money for the Unbanked 101. A guide to Commercial Best Practice*. London. Retrieved from <http://www.gsma.com/mobilefordevelopment>
18. MTNGhana. (2013). MTN Mobile Money. Retrieved May 16, 2013, from <http://www.mobilemoney.com.gh/index.php/what-is-mobile-money>
19. MTNGhana. (2015). MTN Mobile Money. Retrieved June 12, 2015, from <http://www.mobilemoney.com.gh/index.php/how-to-reg-main>
20. NCA. (2015). *Mobile Data Month over Month Subscription Trends Jan-Aug 2015*. Accra. Retrieved from http://www.nca.org.gh/downloads/Month_over_Month_Data_Statistics_JantoAugust2015v.pdf
21. Pesatimes. (2013). Air travelers to buy tickets via M-Pesa. Retrieved from <http://www.pesatimes.com/news/airline-transport/air-travelers-to-buy-tickets-via-m-pesa>
22. Quaye, S. A. (2011). Ghana Postal Service Or Ghana Pifering Service? Retrieved October 09, 2013, from <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=225547>
23. Safaricom. (2011). M-PESA Key Performance Statistics. Retrieved May 30, 2013, from <http://www.safaricom.co.ke/personal/m-pesa/m-pesa-resource-centre/statistics>
24. Safaricom. (2013). Business to Consumer (Bulk Payments Services). Retrieved May 30, 2013, from <http://www.safaricom.co.ke/index.php/personal/m-pesa/m-pesa-services-tariffs/corporate-services/business-to-consumer-bulk-payments>
25. Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (Fifth Edit.). Essex: Financial Times/ Prentice Hall. Retrieved from www.pearsoned.co.uk

26. TigoGhana. (2013). Tigo Cash. Retrieved May 16, 2013, from <http://www.tigo.com.gh/tigo-cash/tigo-cash-3-easy-steps>
27. Tobbin, P. (2012). Towards a model of adoption in mobile banking by the unbanked: a qualitative study. *Emerald Group Publishing, 14*(5), 74–88. doi:10.1108/14636691211256313
28. Txtnpay. (2013). TXTNPAY. Retrieved May 16, 2013, from <http://www.txtnpay.net/index.php>