

# Mobile Money Services in Uganda: Design Gaps and Recommendations

Rehema Baguma

Makerere University, School of Computing & Informatics Technology, Kampala, Uganda  
rbaguma@c.i.t.mak.ac.ug

**Abstract.** Mobile money is a great service for developing countries where the banking infrastructure is still severely limited and very few people can meet requirements of banking institutions. While these services are being greatly received due to the convenience that goes with electronic and mobile based services, the reception and uptake is still limited to literate populations who are the minority in these countries. This paper discusses the current design gaps of the mobile money service in Uganda based on a survey carried out in Kampala and Kayunga districts and provides recommendations on how these gaps can be addressed for the service to benefit more people especially the less literate poor that have no access or cannot afford conventional banking services.

## 1 Background

According to Duga and Getachew [2], the number of mobile phone subscribers is expected to hit 4.5 billion by 2012/2013 globally and this is attributed to emerging markets in Asia, Latin America and Africa. Africa alone has more than 300 million mobile phone subscribers according to the 2009 ITU report. In Uganda by June 2011, the mobile phone subscription had reached 14 million [12]. As mobile phones are multiplying in the developing world, new services are being innovated by Mobile Network Operators (MNOs) in addition to the traditional voice and SMS to remain competitive [9]. One of the prominent services is mobile money which loosely refers to money stored using the SIM (subscriber identity module) as an identifier as opposed to an account number in the conventional banking sense [11]. A notational equivalent in value is kept on the SIM within the mobile phone which is also used to transmit payment instructions. The corresponding cash value is physically held by the MNO, a bank or another third party depending on the business model [3]. MNOs and their agents provide an interface through cash-out (issuing cash on demand) or cash-in (convert cash into notational equivalent) functions providing convertibility between mobile money and cash (Morawczynski, 2009).

In Uganda, all the 5 major MNOs currently offer mobile money service namely: MTN Mobile Money from MTN, M-Sente from UTL, Airtel Money from Airtel, Warid Pesa from Warid and Orange money from Orange Telecom. According to bank of Uganda's supervision report for 2011, mobile money services registered much more significant growth compared to the previous year with the number of registered customers increasing from 1.7m in 2010 to 2.9m during 2011 [10]. MTN Mobile Money, the

first of the five to launch and the biggest in the market, has reportedly registered more than 1,000,000 customers, setup over 1,500 agents/outlets across the country and transferred more than UGX 590 billion (US\$ 245 million) since its launch in March 2009.

Like the case of mobile telephony versus fixed wire, Africa is expected to benefit more from mobile financial services because its financial services industry is not as developed as in Europe, Asia and North America [4]. However, while these services are being greatly received due to the convenience that goes with electronic and mobile based services, the reception and uptake is still limited to the literate urban populations who are the minority in these countries [11]. UNESCO [14] reported that one of the challenges of delivering mobile phone based services is that 41% of the population in developing countries is non-literate and even the literate among the poor are typically novice users of computer technologies. According to the 2011, Demographic and Health Survey (UDHS), the literacy rate of 15-24 year olds is 76.1% [13]. UDHS defines literacy as the 15-24 year olds who have attended secondary school or higher or who can read a whole sentence or part of a sentence. White [16] defines literacy for mobile phone users to mean the ability to understand the text that is displayed to them on the screen in order to be able to navigate the menu system, and then to understand the functionality that is subsequently presented to them. For technological literacy, White [16] defines it as the ability to understand or familiarity with common computer interaction paradigms such as the concept of menu systems, radio buttons or data entry. Chipchase [1] observed that non-literate populations avoid complex functions and primarily use phones for synchronous voice communication. UNESCO's Institute for Statistics defines the level of literacy as the percentage of people aged 15 and above who can with understanding, read and write a short, simple statement on their everyday life. Ndiwalana et al [11] noted that the bulk of mobile money transactions in 2010 in Uganda (including receiving) were happening in Kampala (the capital city of Uganda). In addition most respondents (72.6%) in Ndiwalana et al. study [11] reported having access to other financial services through a personal account in a formal financial institution and 72.7% reported being currently employed. This means that majority of the respondents in this study are not among the conventional mould of users expected to gain most advantage from using mobile money i.e. the unbanked rural population. White [16] noted that for businesses which are targeting poorer populations, ensuring that the products and services can be understood and used by non-literate people will increase their potential to succeed.

Therefore there is need for research on how mobile money service can be designed such that more low-literate and novice users of technology products who comprise the bulk of the unbanked in Uganda and other developing countries can take it up and use it. Medhi et al [8] revealed that non literate and novice users of technology face several barriers with existing text-based mobile interfaces such as difficulties understanding hierarchical structures, soft keys, scroll bars, non-numeric inputs, and specialized terminology. This paper discusses the current design gaps of the mobile money service in Uganda based on a survey carried out in Kampala and Kayunga districts and provides recommendations on how these gaps can be addressed for the service to benefit more people especially the less literate poor that have no access or cannot afford conventional banking services. The rest of the paper is organized as follows: methodology, design gaps for the mobile money service in Uganda, suggestions on how the design gaps can be addressed, and conclusion.

## 2 Methodology

To accomplish the objectives of this study, we conducted field interviews with current mobile money users and Agents (business people who buy franchises from MNOs to trade in the Mobile Money service) in peri-urban areas of Kampala city and rural locations in Kayunga district all in Uganda. All the participants owned or had access to a mobile phone. We interviewed 100 users (40 from Kayunga and 60 from Kampala), and 25 agents (10 from Kayunga and 15 from the suburbs of Kampala City namely; Najeera, Kiwatule, Natete and Kawempe. Kayunga District is a predominantly rural settlement in central Uganda. Interviewed users were met at mobile money shops and chosen randomly. The interview with users covered the languages spoken and written, functions on a mobile phone used, whether they find the mobile money interface easy to use, what is liked about mobile money, what they would change, value of mobile money to their day today activities, challenges faced using mobile money and possible solutions. The interview with mobile money Agents covered: the languages spoken and written, whether they find mobile money interface easy to operate, business viability of mobile money, what they like about mobile money, what they would change, desired versus available services, challenges faced and possible solutions. The obtained data was analysed using cross case/content analysis method to examine themes, similarities, and differences across the feedback obtained. The next section presents the findings from the study.

## 3 Findings from the Study

### 3.1 Social-Demographic Characteristics of the Participants

Of the 100 users interviewed, 60% were male and 40% female. 35 percent had a degree or diploma, 25% had completed Advanced Level (High School), 20% had completed Ordinary Level (Middle School), 15% had completed primary school (junior school) while 5% had no formal education. All the participants had ever used mobile money. They were residents of the area of study and 40% percent had personal bank accounts. Of the 25 agents, 80% were female and 20% male. The next section discusses the design gaps for the mobile money service in Uganda as per the feedback obtained from interviewing users and agents.

### 3.2 Design Gaps for the Mobile Money Service in Uganda

**English Interface:** The interfaces of all the mobile money services in Uganda is in English. This means the low literate masses cannot use it without intermediaries. Hinman and Matovu [4] noted that one of the main causes of people not engaging with mobile money services is due to illiteracy among other factors. From the interviews, users complained that customer care staff use English only and speak very fast. On the other hand, an Agent noted that most people from villages do not understand English hence they have to interpret for them but this keeps away some potential users who consider this an inconvenience or suspect that they can easily be cheated. Therefore the popular premise that mobile money through an increasingly large

mobile phone user base will provide a platform that could potentially be leveraged to service the financial needs of the poor is yet to be a reality. Additionally, even the literate but poor are not likely to use it or use it as much as they would due to association of English language with the wealthy and prestigious members of society. In a study conducted by Medhi *et al* [8], participants in the study on designing mobile interfaces for novice and low literacy users strongly and positively associated the English language with wealth and prestige. This was due to a combination of mindset inherited from colonial history as well as the modern-day fact of greater economic opportunities available to English speakers. The less educated that is those who cannot read and write in English at all or those with difficulty doing the same find it hard to learn and remember how to use mobile money. One user noted that “I stopped in primary five therefore I can only read and write in my local language-Luganda but mobile money is ‘written’ in English therefore I keep asking for help from Agents whenever I want to use the service”. On the other hand, those who can read and write English without difficulty, reported that they found learning and remembering how to use mobile money services particularly the menu driven MTN mobile money very easy because of the prompts like one said “I follow prompts which is easy for anyone to follow if one can read English”.

**Limited Understanding of How Some Mobile Money Services Work:** Services related to buying and selling goods or paying for utilities like water and electricity are still least used. One of the reasons for this is limited understanding of the m(e)-commerce concept as one respondent noted; *“I am still not sure that mobile money can reach when I use it to pay water bills otherwise it would be convenient”*.

**Limited Coverage of the Payment Function:** The payment function of mobile money service to-date covers a few aspects such as mobile phone credit, utility bills and school fees. However users are also using mobile money to settle informally other common payment obligations such as transport fares, professional fees, hotel/restaurant bills, rent, etc. However, the problem faced with this informal arrangement is that it depends on the willingness and flexibility of the recipient and in a majority of cases, they decline this form of payment due to various reasons such as having to bear the burden of converting mobile money into cash, limited understanding and trust of mobile money due to lack of sensitization, non-membership to mobile money services (transacting with a non-registered member attracts very high charges), failure to agree on transaction charges which the payee has to add on the bill, etc.

**Desire for Mobile Money Service to Provide Services Provided by Banks:** Some users view mobile money service as an alternative to conventional banks hence expect it to offer most of the services provided by banks. During the interviews, users requested MNOs to consider providing loans particularly airtime (mobile phone credit) and mobile money. They noted that this is particularly useful when one is in a remote place far from home. They reason that payment can be redeemed as soon as the user loads airtime/mobile money. At the moment, only Warid loans UGX 1000 airtime and none of the service providers loans mobile money. Viewing mobile money service as an alternative to banks is not surprising given that 100% of the respondents interviewed were all using sending, receiving and depositing money functions of mobile money services that are traditionally provided by banks.

**Lack of Feedback on System Status during Interaction:** For some services of mobile money such as paying payTV dues, users are not kept informed about what is going on during interaction. One user noted that: *“when you use a scratch card (an alternative option for paying TV dues), there is a person at the other end during the crediting process, so it is more reliable compared to mobile money where feedback is not guaranteed and in case of failure one is left in suspense concerning how far the transaction had gone”*.

**Long Menu:** Some of the users interviewed complained that the menu for mobile money services is very long hence difficult to remember how to use. MTN mobile money has 7 items at the main menu and between 1-4 options at sub menu level. Airtel Money also has 7 items at the main menu and between 1-4 options at sub menu level, M-sente has 8 items at the main menu and between 1-5 options at sub menu level while Warid Pesa is command driven. When asked if mobile money was easy to use, one interviewee responded: *“someone just took me through once but the menu is very long so it has taken me a lot of time to learn how to use it”*.

**Confusing Functions:** Users noted that there are some confusing functions such as redundant functions like non-mobile user function in MTN mobile money and the combined sending and receiving functions in Warid pesa. One commented that *“the non-mobile user option under send money to in MTN mobile money confuses me for it serves no purpose”*. In Warid pesa, sending and depositing are not separated which confuses users. Users would like them to be separated like is the case with MTN mobile money.

**Weak Error Prevention and Correction:** The design of the current mobile money services has limited support for error prevention and correction in particular regarding sending money to the right recipients. According to the users and agents interviewed, MTN and Warid do not have adequate measures to protect against losses from errors or mistakes e.g. reversing a transaction or freezing an account when an error is made sending or depositing money on a phone. Many users interviewed reported having sent money to wrong recipients or received money from unknown people which could not be got back. Some of the responses given include:

*“I have been receiving money from someone whose telephone number is almost similar to mine except for one digit and every time, I have to send it back because I am born again but I have heard of people who could not recover their huge sums of money because the people they sent it to did not cooperate”*.

*“I Sent Money to a wrong Phone number and when I called the phone, the owner did not pick it”*

*“I have never made a mistake. I am always careful when transacting but someone sent me UGX 900,000 last month which I had to go through the inconvenience of sending back”*.

One Agent called Musa in Kiwatule trading centre, in the process of sending UGX 250,000 had the receiver credited 3 times due to poor network connection. When this was reported to MTN’s customer care, there response was that they could not do anything because the provision to block such numbers was removed since the process provides many levels of approval for the agent and customer to identify such anomalies

before completion of the process. In another incident at another service centre in Najee-ra run by Mariam Nansubuga, a customer ran away before paying a deposit of UGX 900,000 that had been processed. When MTN's customer care was contacted, they gave the same regret as in the first case. The other incident involved a fish monger called Mzee Zakayo who paid UGX 700,000 by mobile money to his supplier but sent it erroneously to a number that was switched off and the number was still off at the time of the interview. In desperation, the agents have resorted to informal negotiation with affected customers and other third parties to avoid mob justice and costly law suites. On the side of customers, they are losing confidence in the service particularly those that have been affected or have heard about the security incidents. Hinman and Matovu [4] noted that one of the reasons why some people are not yet engaging with mobile money services in Uganda is due to fear of losing money in the transaction among other factors.

**Operation Tied to Unnecessary Constraints:** For Airtel money, all transactions are limited to availability of airtime on one's phone yet charges do not come from airtime. Users suggest delinking transactions from availability of airtime on one's phone after all this is not where the charges are made.

**System Interface Does Not Render Well on Computer:** Agents of M-sente complained that accessing the system on a computer which some Agents prefer is a problem. That is it does not render seamlessly as it does on a phone. So the current interface of M-sente is device dependent which is a poor user interface design practice.

### 3.3 Other Gaps

**Unstable Network.** The network especially that of MTN is sometimes on and off like in the months of November 2011 to January 2012 and when it is off, business comes to a standstill hence loss of profits. This situation especially for MTN is attributed to a larger customer base compared to other MNOs. To make matters worse, there was no dedicated support line for mobile money Agents/customers for MTN, Airtel and Warid Pesa at the time of the interview, and the customer lines shared with voice services are always busy. Some of the responses from respondents include:

*"When the network is off, we cannot work"*

*"Airtel's network is limited to towns- There is no network deep in the villages"*

*"You find people in villages wanting to use airtel money but network is a problem".*

*"UTL needs to improve network performance so that more people can use it.*

*"I am breaking even because I am dealing in other things i.e. it is not the only business I am involved in because availability of the network is limited to towns. Beyond, there is no network so people cannot use the service so we have very few customers"*

**Limited Sensitization/Education of the Public about the Service:** Agents complained that service providers have not sensitized customers about the service which would create more demand hence more profitability.

**Change of Terms without Consultation:** Agents accused MNOs of regular change of terms of engagement without consulting them e.g. initially commissions on each transaction would be deposited on an Agent's account daily but at the time of the study, deposits were being made monthly which made it hard to track deposits. Agents and users would like to be more involved in the introduction of changes as key stakeholders.

### 3.4 Recommendations for Addressing the Design Gaps

**Provide an Alternative Luganda Interface:** MNOs need to consider providing a Luganda interface for mobile money in addition to the English interface as one of the strategies to increase usage among the less literate and poor sections of the population whose proficiency in English is limited. One Agent estimated that this could increase usage to more than 5%. Another Agent shared his opinion that a luganda version/option would make it easier for many to understand how the service works and how to use it. Some less educated users receive transactional messages much later after the transaction and have to spend time and money going back to the agent for interpretation. An option for the interface in a language they understand would save them money and time.

**Consider Non Text Interfaces such as Spoken Input and Graphical Output:** Medhi et al [8] in their study on designing mobile interfaces for novice and low literacy users established that text interfaces are unusable without literacy. They noted that non-literate subjects need non-text user interfaces such as spoken input and graphical output. Mobile money service providers should consider this option to cater for the user segment in the country that cannot read and write.

**Visual Representation of Functions:** Most people considered non-literate have some level of reading ability for example they can read numbers and can recognize at least a handful of symbols and words. But the design of most mobile services has not exploited this opportunity to make them more usable to them. To address this gap, White [16] recommends a visual icon based user interface that is in turn supported by voice prompts. The voice prompts help people navigate and learn the user interface as well as guide the users through the tasks supported by the service such as sending money. The prompts can also serve to provide confirmation of successful accomplishment of the given tasks.

**Provide Mechanisms for Error Prevention and Correction at the Front End:** According to Nielsen (20110), even better than good error messages is a careful design which prevents a problem from occurring in the first place. The mobile money design should incorporate effective error prevention and correction mechanisms such as options to suspend a transaction mid-way or immediately after (with in a given window period) in case of an error or fraud, blocking withdrawals for accounts pending security issues etc. Some MNOs already have some measures in place. For example, Airtel keeps message history and this function has made it more secure compared to others. In addition, during the sending process, the sender is given information about the name of the person he/she intends to send money to using registration information therefore in case of a mistake made one is able to know and correct it before proceeding. With M-sente during transacting, one is asked to enter a phone number twice and has to confirm the amount.

**Encrypt Pin:** Interfaces of all MNOs except Warid use encrypted pins. Warid should also implement use of encrypted pins during user login to prevent pin tapping from wrong elements.

**Keep Users Aware of What Is Happening during Interaction:** Nielsen (2012) in his Nielsen's 10 Usability Heuristics advises that a system should always keep users informed about what is going on. This can be achieved through appropriate feedback within reasonable time which Nielsen (2012) calls visibility of system status.

**Use Fewer Menus and Dedicated Buttons:** Dix et al (2009) noted that the short term memory capacity of a human being is limited and can only hold effectively  $7 \pm 2$  chunks at a time. Hence the menu design of mobile money needs to keep the number of menu items at 7 maximum for a more usable interface. Jones et al. (2000) questioned suitability of menu-based navigation for novice users of computer technology which is the case with mobile money users and recommends designs with fewer menus and dedicated buttons for this target group. This view is supported by Lehrman [7]. Related to this, there is need to remove redundant functions and separate combined functions into distinct functions to make them easier to use.

**Better Sensitization to the Public:** MNOs should design and execute better sensitization campaigns for the public about the concept of mobile money to increase understanding of the service. This could partly be inbuilt within the service's interface. Hinman and Matovu [4] noted that the source of many people not engaging with mobile money is confusion with the mental model of the service. They observed that most promotional materials for mobile money services focus on awareness and benefits of the service. Hinman and Matovu [4] suggest that in order to fill the conceptual gap of how the service works, experience with creating and maintaining a formal account such as a bank account or account with a mobile service provider is required. The two noted that to the people in rural Uganda, the concept of money transfer is foreign but they do understand and have a wealth of experience with trading in particular exchanging assets that are equal in value e.g. exchanging a bull for a cow or a piece of land for a number of cows. Therefore it is such concepts that can be used in sensitizing the public rather than the abstract money transfer terminology. In Hinman and Matovu's [4] study, people who seemed to conceptually grasp how mobile money services work were the ones who related the service to buying and selling airtime and they noted that unlike transferring money, selling airtime mapped to their existing behavior of liquidating fixed assets when cash was needed or gifting fixed assets to people such as in the case of remittances.

**Avoid Unnecessary Constraints in the Interaction Process:** Airtel ties transactions to availability of airtime on one's phone yet this is not where the charges are made. This constraint and any others in this category that the study may not have found out should be removed to make the service easier to use for users.

**Device Independence:** Users of mobile money use a variety of devices ranging from high end to basic mobile phones as well as tablets, laptops and desktops. Therefore it is important to make the mobile money interface device independent such that it renders seamlessly on a variety of standard devices.

**MNOs Should Share and Learn Each Other's Best Practices:** instead of reinventing the wheel, MNOs should collaborate, learn from each other and put in practice each other's good practices. For example, some MNOs already have some effective error prevention and correction measures in place such as keeping message history and giving the sender information about the name of the person he/she intends to send money to using registration information such that in case of a mistake made one is able to know and correct it before proceeding by Airtel,. With M-sente, during transacting, one is asked to enter a phone number twice and has to confirm the amount. In addition, Agents have special dedicated numbers to call in case of a problem for quick help. These are measures MTN, Warid and Orange are lacking. Warid pesa and M-Sente could also learn and implement MTN's menu driven interface to replace their command line interface that users and agents find hard to use. In addition, Warid can learn from the rest the benefits of encrypting the pin during login and learn from them if necessary on how to implement it to provide more security to the users.

#### **Other Design Considerations Suggested by Users and Agents:**

- Current statements are too short e.g. MTN's mobile money statement covers the last 4 transactions only. Users recommended coverage of the last 10 transactions at minimum.
- Bonus: Users would like to be given a bonus for example when one sends/receives 500,000 Uganda shillings and above.
- Increase limit: Users would like an increment to the limit transferable in a day from 2,000,000 to 10,000,000 Uganda shillings.
- Provide for overdraft of a certain limit in times of emergencies: Users recommended an allowance for overdraft of at least Uganda shillings 50,000 to cater for emergencies
- Interoperability across networks: Users noted that the ability to transfer money between networks and banks would make the service more flexible to use for them. At the time of the study, only Warid had this service.
- Connection to Bank Accounts: Users would like to have their mobile money accounts connected to their bank accounts. This they said would help them link mobile money transactions with their bank transactions which would make overall management of their financial transactions easier.

## **4 Conclusion**

Mobile money is a great service to developing countries where the banking infrastructure is still severely limited and very few people can meet requirements of banking institutions. The short time it has been in operation in Uganda has seen many achievements but also there are some challenges including design related that are threatening to stifle its usage among the people so much in need of it. This work has highlighted the design gaps and possible ways these can be addressed. We hope these insights will contribute to the growing body of knowledge around mobile money services and help to improve mobile financial services in Uganda as well as in other emerging markets.

## 5 Limitations

The work reported in this paper is based on factual findings from a group of respondents in the out skirts of Kampala city and Kayunga district. It is largely qualitative giving a description of the current design gaps of mobile money in the country according to the user experience of users and agents rather than a quantitative picture of users and Agent's opinions about the service. This approach was by design because the goal of the study did not require opinions but facts about the design gaps that could be verified independent of the participants.

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