Investigating Mobile Banking in Mali: HCI Experience of 'Man in the Street'

Fatoumata G. Camara[1], Daouda Traoré[2], Gaëlle Calvary[1], and Amal Kali[3]

[1] Univ. Grenoble Alpes, CNRS, Grenoble INP**, LIG, F-38000 Grenoble, France
`fatoumatag.camara@gmail.com, gaelle.calvary@univ-grenoble-alpes.fr`
[2] University of Ségou, Ségou, Mali
`daoudatr2008@gmail.com`
[3] Orange Labs, 2 Avenue Pierre Marzin, 22300 Lannion, France
`amal.kali@orange.com`

Abstract. Many studies investigating the use of mobile banking in developing countries focus on specific user groups (i.e., illiterates, low- and semi-literates, the unbanked, and/or poor, rural and underserved communities). Therefore, existing literature fails to provide understandings about mobile banking use in the developing world from a general perspective.

In this paper, we report on a study conducted in Mali to understand the use of a mobile banking service. In total, 77 people coming from different neighborhoods of Bamako and exercising a large spectrum of jobs participated in the study. The paper sheds light on the use of mobile phone and mobile banking in Mali; suggests additional features, particularly related to communication, for the mobile banking service; and discusses findings that are of relevance for Human-Computer Interaction for Development (HCI4D) in general.

Keywords: HCI4D · User Studies · Mobile Banking · Mali.

1 Introduction

The use of mobile banking services in developing countries has been investigated in many studies [11–15, 18]. One common point is the focus on specific user groups as highlighted in Table 1. Table 1 shows that previous studies addressing the use of mobile banking services in the developing world have mostly targeted people without literacy or with a low- or semi-literary and/or with low income. If the aforementioned user groups can be assumed to take much advantage from mobile banking, there are not representative of an entire population. By focusing on specific user groups, previous studies addressed specific problems. For instance, Medhi et al. reported that hierarchical navigation and scroll bars hinder the use of money-transfer for non- and semi-literate [12].

** Institute of Engineering Univ. Grenoble Alpes

Table 1. Studies related to mobile banking in the developing world.

Reference	Targeted user group(s)	Location(s)
[11]	Low-income	South Africa
[12]	Non-literate, semi-literate	India, Kenya, the Philippines, South Africa
[13]	Novice, low-literate	India, Kenya, the Philippines, South Africa
[14]	Low-income, low-literate	India, Kenya, the Philippines, South Africa
[15]	Poor people	Kiberia (a slum in Naorobi), Bukura (a village in Western Kenya)
[18]	Low-income, low-literate	Kenya

Investigating the use of mobile banking in the developing world with larger audiences is of great importance in order to get more general understandings and their implications for future services design and development. In this work, we report on a questionnaire study conducted to understand the use of a mobile banking service in Mali. The study was mainly carried out in Bamako, the capital city, but involved a sample of participants selected independently from gender, degree of education and literacy, profession, income, and residential area. In addition to shedding light on usage around the mobile banking service and suggesting new features for the mobile banking service, we report interesting findings that are of relevance for Human-Computer Interaction for Development (HCI4D) [10].

2   Context of the Research

Mali is located in West Africa with an area of 1.241.238 square kilometers and a population of 18.542.000 inhabitants [2]. French is the official language in Mali, but remains mainly the administrative one. Indeed, the majority of Malians mostly communicates with each other in Bambara in the everyday life: Bambara is the national language. According to statistics from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the literacy rate among the population aged from 15 years has been increasing in Mali and reached 33.07% in 2015 [1].

The mobile banking service under investigation offers the primary functionalities of such a system: money transfer as well as cash deposit and withdraw. The service also provides additional functionalities, which are purchase of communication credit and tickets for events (e.g., concerts), bills payment (e.g., TV subscriptions, electricity, insurance), cash delivery, remittance transfers to partnered merchants (e.g., restaurants, gas stations, pharmacies), and access to different types of information (e.g., account balance, transactions fees).
The service users can complete transactions using own phones (through USSD or the mobile application) and/or at dedicated kiosks (Figure 1) or partnered corner shops widely spread across cities.

Fig. 1. A customer completing a transaction at a dedicated kiosk in Ségou.

It is important to mention that the mobile application is only available for Android devices. It is also important to mention that the mobile application of the service under investigation is not a user-friendly one. An expert evaluation revealed that the app suffers from major usability problems, particularly in terms of consistency.

3   The Study and Participants

We investigated the use of the mobile banking service through a questionnaire study, which consisted of two phases: the pre-questionnaire and the actual questionnaire. In both phases, the questionnaire was paper-based and administrated as a face-to-face structured interview. The researcher was in charge of asking questions and filling the paper-based material with the respondent's answers. All participants were compensated with a communication credit card.

3.1   The pre-questionnaire

The pre-questionnaire was aimed to assess the pertinence of identified topics to be addressed; assess the appropriateness of questions formulation and, possibly, identify, other relevant topics to be considered. The pre-questionnaire was composed of closed, but also open questions in order to get a better understanding of spectrum of answers for some topics.
The pre-questionnaire was tested with 26 people in total. Even though the whole study was mainly carried out in Bamako, the pre-questionnaire phase involved 9 people from Ségou (a region of Mali laying in the south-center part of the country). Respondents were 17 men and 7 women, aged from 19 to 74 (mean:

37) and exercising different jobs: 1 human resources manager, 1 jeweler, 2 chauffeurs, 1 sales representative, 1 accountant, 1 program director, 1 agent of the mobile banking service, 4 teachers, 5 students, 1 official, 1 guard, 2 administrators, 1 military man, 3 retirees, and 1 domestic worker. With such a wide range of professions, the pre-questionnaire phase involved people with different levels of education, literacy, and income. The 26 respondents were also from different neighborhoods of Bamako and Ségou and, some of them, had close ties with rural areas. For instance, the domestic worker has received no formal education at all; the chauffeur lives in Bamako while his family (his wife and two children) stays in the village.

Prequestionnaire sessions were audio-recorded and lasted 25 minutes in average. Recordings were subsequently analyzed using content analysis.

3.2   The questionnaire

The pre-questionnaire phase allowed to identify possible answers for the open questions as well as additional relevant topics. On the basis of these outcomes, we elaborated a second version of the questionnaire (i.e., the actual questionnaire) with only closed questions and organized around the following topics: (a) demographic information (age, gender, marital status); (b) use of the mobile phone (number of phones and SIMs, communication means, Internet usage); (c) usage of the mobile banking service (types and purposes of transactions, means for completing transactions, frequency of use, communication around transactions, satisfaction with the mobile banking service); (d) relationship with traditional banking institutions and mobile banking-bank accounts association; (e) questionnaire administration conditions (language, social tie between the enumerator and the respondent, location, compensation acceptance, photo taking).

77 people responded to the questionnaire: 53% male and 47% female aged from 19 to 59 (mean age: 30). As respondents were randomly selected, we encountered them everywhere: in homes, at work places but, also and mainly, on the street. In the overall, respondents were from over 20 neighborhoods of Bamako and exercised more than 30 different jobs at the time of the study. The neighborhoods involved in the study included both areas labeled as 'advantaged' and areas labeled as 'disadvantaged'. Participants' jobs also included professions requiring a high degree of literacy and with high income (e.g., engineer) as well as professions requiring only a low degree (or no) literacy and with lower income (e.g., taxi driver, tailor).

4   Findings

The findings reported in following sections are based on only data from the actual questionnaire phase.

4.1 Current usage of mobile phone

Mobile phone use in Africa has been previously investigated (e.g., in [19, 20]. The aim here is not to compare our results with the ones reported elsewhere but, rather, to get a good understanding of the respondents profiles.

All respondents were mobile phone users. Data highlighted a widespread use of dual SIM phones since 59% of the participants declared to own only one phone while 73% declared to use two SIMs with the same phone (mostly from different Mobile Network Operators).
Smartphones appeared to be the predominant type of phone among our respondents' mobile phones. 81% of mobile phones owned by questionnaire respondents were Smartphones. This high percentage of Smartphone ownership is not surprising and can be explained by the high penetration of low-cost Smartphones in the Malian market.
The majority of respondents declared to have Internet connection on their phone through data (83%) and appeared to be heavy mobile apps users. For instance, 75% of them declared to use WhatsApp for voice calls and 62% for messaging; 66% of them declared to use YouTube.

4.2 Current usage of the mobile banking service

In [16], Ndiwalana et al. present a survey, that did not focus on people without bank account or with low-literacy or low-income, to study mobile banking use in Uganda. Indeed, in [16], respondents included people with no formal schooling as well as people with degree (or above); people with no personal account as well as people with an account. Additionally, if the survey was only carried out it Kampala (the capital of Uganda), according to the authors, many parts of the city were involved in the study. Considering the aforementioned, the work presented in [16] is particularly relevant to our work.
In this section, we report our findings and discuss them in relation to the ones of Ndiwalana et al.

Users. All our respondents were users of the mobile banking service. Yet, the study involved illiterate as well as literate and high-income as well as low-income individuals. In addition, among respondents, 49% had at least one bank account and 32% several bank accounts. Only 18% of respondents did not own a bank account at the time of the study. Therefore, as in Uganda, not only the user groups predominantly addressed in the literature are mobile banking users in Mali. Indeed, in [16], 94% of the survey respondents reported a high level of literacy in own language and 73% declared having access to other financial services through a personal account in a formal institution.

Purposes of transactions. Data highlighted that respondents use the mobile banking service to complete mostly the following transactions: money deposit

into their own account (99%), money transfer to someone else's account (97%), withdrawal of money sent by another person (100%), communication credit purchase (93%), and bills payment (54%). Only 5% of respondents declared to use the service for other purposes.

We further investigated purposes of money transfers between individuals. Unsurprisingly, social mutual aid appeared as one of the main purposes for transactions within our respondents (Figure 2). We analyzed the social circles involved in such transactions and data highlighted that: 87% of respondents send to and receive money from the immediate family, 64% to and from the extended family, 22% to and from friends, 12% to and from acquittances, 9% to and from colleagues.
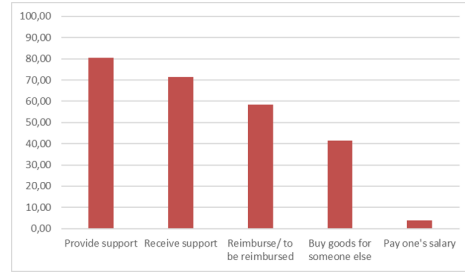
Fig. 2. Purposes of money transfers between individuals.

These findings are globally aligned with the ones reported by Ndiwalana and colleagues: providing and receiving financial support from people is the main purpose for money transfers; mobile banking is also used for other diverse purposes. However, it is important to highlight that the percentage of respondents sending and receiving money from the immediate family is higher within our sample (in comparison to the sample investigated by Ndiwalana et al.) and that the percentage respondents sending and receiving money from the extended family is even significantly higher within our respondents sample. This finding likely highlights differences in relationships between social circles in Mali and in Uganda.

Frequency of use. Within respondents, 35% declared to use the service several times a week, 23% several times a month, 22% up to several times a day, 9% once a week, 7% once a month, and 4% several times a year. These results suggest that our participants are heavier mobile banking users compared to participants in the survey conducted by Ndiwalana et al. in which the majority declared using mobile money at least one a month.

The findings discussed above highlight that a large percentage of participants are intensive and frequent users of the mobile banking service. Therefore, the user groups predominantly addressed in the literature are not the only ones to take benefit from mobile banking in Mali.

Means for completing transactions. USSD, dedicated kiosks, and corner shops represent the different means for accessing to the mobile banking service. All respondents declared to use the service using the phone through USSD and dedicated kiosks/corner shops. Despite 81% of respondents possessing Smartphones, only 13% declared to use the mobile app for the mobile banking service.

Interestingly, we discovered that the sender, the receiver and, eventually, the operator at the dedicated kiosk or the corner shop are not the only ones involved in money transfers between individuals. Indeed, 39% participants declared to charge other people to send or receive money on their behalf and 15% reported to have sent or received money on the behalf of other people. Further, we discovered that relationships between the ones and the others reflect social hierarchies in the Malian society: parents, older people, and employers charge respectively children, younger people, employees to complete transactions on their behalf. This finding highlights the need for additional features, so that the mobile banking service can support this social specificity and, therefore, contribute to reducing errors and scams that can be caused by this practice.

Communication around transactions. The pre-questionnaire phase highlighted that senders and receivers usually communicate about money transfers to: check whether the receiver is registered with the mobile banking service (registration is necessary for using the service), inform the receiver prior and/or after sending money, or inform the sender upon money reception.
Data collected through the actual questionnaire confirmed, indeed, that: 92% of participants communicate with the receiver before and after they send money; 83% of participants communicate with the sender before and after they receive money. However, since the mobile banking service does not include any communication features, respondents declared to rely on other means in order to communicate around money transfers: standard calls for all of them (100%) and SMS for 30%. Mobile apps such as WhatsApp and Viber appeared to be only a little involved in such communications.

On the basis of this finding, we suggest that the mobile banking service integrates a feature allowing the user to check if a given phone number or contact is registered with the service. Additionally, we suggest that the mobile banking service proposes to initiate a call or send a text (that can be automatically generated using the transaction information) after sending or receiving money. Considering that money transfers can involve several people, the user could be provided with the possibility to send a text to one more recipients.

Satisfaction with the mobile banking service. We recorded a high rate of satisfaction from questionnaire respondents with the mobile banking service. More than half of respondents (60%) are satisfied; 39% are fairly satisfied; only 1% declared to be poorly satisfied.

5   Discussion and Future Work

This paper reports on a study conducted in Mali to investigate the use of a mobile banking service. To the best of our knowledge, our work is the first of the kind to address this country. Unlike most previous studies related to mobile banking use in the developing world, we did not focus on specific user groups (illiterates, low- and semi-literates, the unbanked, and/or poor, rural and underserved communities). As a result, we shed light on usage around the mobile phone and mobile banking in Mali from a more global perspective. We highlighted countries specificities. We also discussed differences between Mali and Uganda.

Despite our respondents being, for many, Smartphones owners and mobile apps users, only 13% declared using the mobile banking service through the mobile app. Indeed, our expert evaluation of the service mobile app highlighted major usability issues. Therefore, in our opinion, poor usability explains the low adoption of the service mobile application. Nevertheless, data showed a high rate of satisfaction among respondents. This suggests that utility clearly takes precedence here over usability since the mobile banking service does serve a purpose. Furthermore, it is important to remember that our study participants included people who should not be not able to use the mobile banking service mobile app because of literacy. So, with our aim to address the 'man in the street' (instead of focusing on literacy, for instance), we also highlight that good usability matters for every user and identified different additional features to improve the mobile banking service. As a consequence, future studies should shift the focus beyond literacy to focus on utility and consider usability for all. This recommendation should be considered for HCI4D projects in general since a broader review of the literature highlighted that many different studies focus on specific users groups [4–9, 17, 20]. To do so, we propose that future work investigates adaptation to the context of use as a means to address literacy. If there is no consensus on the definition of the context of use, adaptation generally takes the user into account. We propose considering degree of literacy through the user dimension of the context of use. As such, research on adaptation can take advantage of knowledge from HCI4D (and other relevant ones) to tackle illiteracy. Literacy issues, of all kinds, would be then addressed in less stereotypical manner particularly considering that not only developing countries face such issues [3].

In future work, we plan to investigate further in order to understand the extent to which cultural values influence technology use and adoption in Mali. In particular, we would like to investigate whether some cultural values held by Malians could explain people's satisfaction with the mobile banking service studied in this work.

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