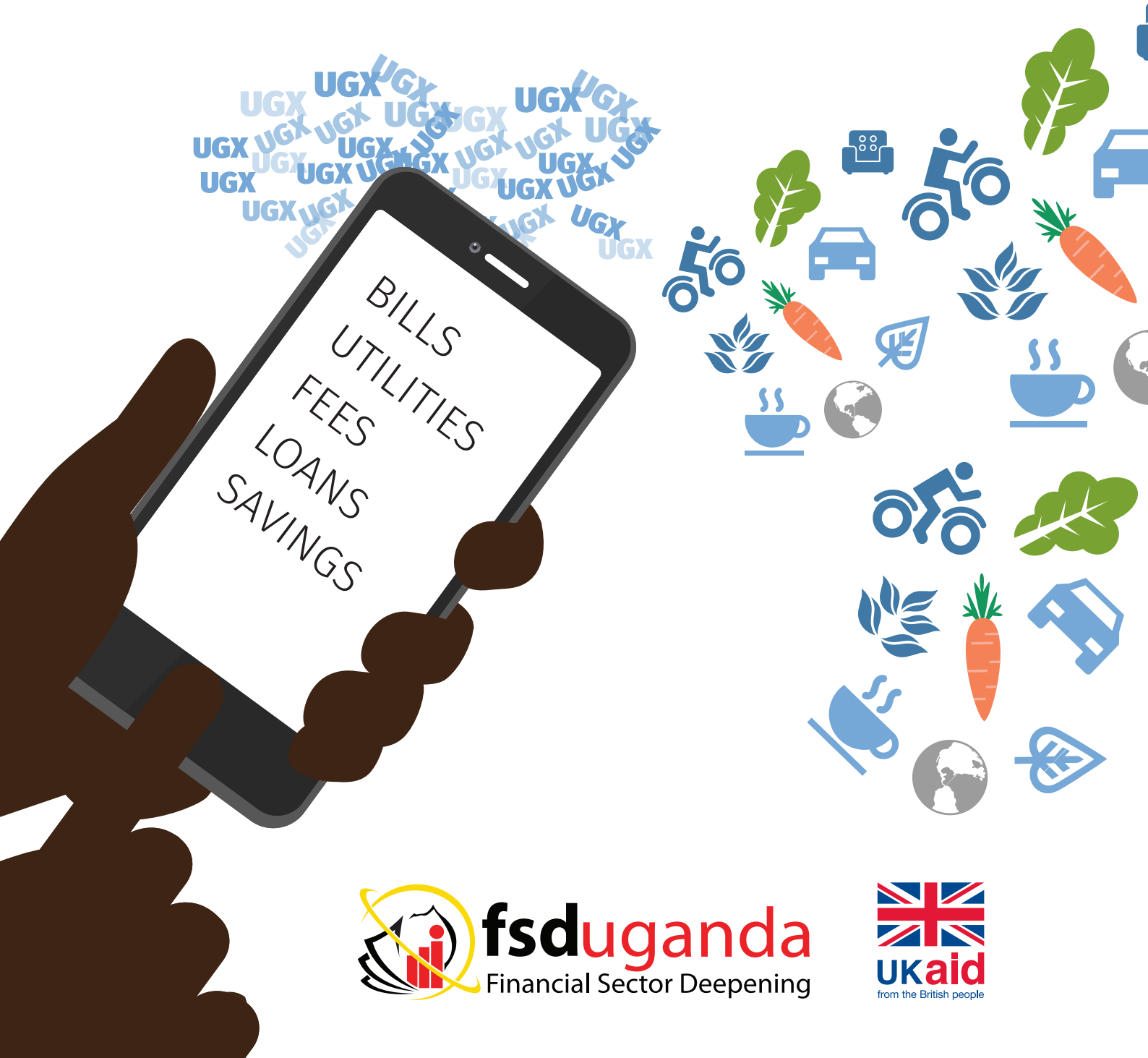
MARKET RESEARCH ON **INTEROPERABILITY IN MOBILE FINANCIAL SERVICES IN UGANDA**

SEPTEMBER 2017



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from the British people

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LIST OF ACRONYM

BoU	Bank of Uganda
CAPI	Computer-Assisted Personal Interviewing
CGAP	Consultative Group to Assist the Poor
CICO	Cash-In and Cash-Out
DFS	Digital Financial Services
FCL	FRIENDS Consult Ltd
FSDU	Financial Sector Deepening Uganda
MFS	Mobile Financial Services
MM	Mobile Money
MMSP	Mobile Money Service Provider
MNO	Mobile Network Operators
MSMEs	Micro, Small and Medium Enterprises
P2P	Peer-to-Peer
PAPI	Paper-and-Pencil Interviewing
PoS	Point of Sale
SP	Service Provider
SPSS	Statistical Package for Social Scientist
UGX	Uganda Shillings
UTL	Uganda Telecommunication Limited

EXECUTIVE SUMMARY

Introduction

Friends Consult Limited (FCL) was commissioned by Financial Sector Deepening Uganda (FSDU) in collaboration with Bank of Uganda (BoU) to conduct market research on interoperability in mobile financial services in Uganda. Interoperability is defined as the ability for different systems to connect with one another.[1] –It is increasingly seen by digital financial experts, as well as government and development agencies, as a business opportunity; a means of increasing the volume of transactions as well as improving financial inclusion. With regards to East Africa, mobile network operators in Tanzania are implementing interoperability while in Kenya it is expected to commence in the financial year 2017-18.[2] In Uganda, FSDU and BoU are aware of the importance of interoperability, while some mobile money service providers (MMSP) – i.e. Airtel and MTN – are already exploring how they can work together.

For interoperability to be effective, the development of a business model which reflects the demand for interconnection is key. This research, therefore, focused primarily on mobile money/non-bank mobile financial services users (both current and potential) and mobile money agents. It explored two types of transactions: peer-to-peer (P2P), and cash-in deposits/cash-out withdrawals (CICO). Specifically, the research aimed at allowing stakeholders to:

i. Ascertain whether there is a need for interoperability among users, non–users and agents of mobile financial services
ii. Ascertain hindrances encountered due to lack of interoperability
iii. Identify some of the existing or potential costs that the various segments (particularly agents) bear because of not having interoperability in mobile financial services
iv. Ascertain clients' willingness or propensity to pay for interoperability.

Study methodology

The study design was mainly quantitative, covering both urban and rural areas. It involved conducting face-to-face interviews with randomly selected end-users and mobile money agents. Secondary data was also obtained through a review of relevant documents about interoperability, both in and outside Uganda. The targeted respondents were current and potential (those who have never used mobile money services before) users and mobile agents. Overall, a total sample, determined statistically, of 2,000 end-users and 500 agents was drawn from 17 districts, randomly selected from five regions across the country: western, northern, eastern, central and Kampala.

In preparation for data collection, study tools were designed and approved by FSDU and research assistants were trained for three days. During fieldwork, the assistants were deployed based on language spoken, and were organised into four teams. Each team was made up of between seven and nine enumerators, one supervisor, and one team leader. Data collection was conducted in 12 days, and supervised by the technical team leader and field supervisors. Quality control was performed by other members of staff.

Computer-Assisted Personal Interviewing (CAPI), using tablets, was employed, with the questionnaires scripted using SurveyCTO. The completed interviews were uploaded to a server at FCL and exported to SPSS for checks and analysis. A report outline was developed and approved by FSDU to guide analysis and report writing. Primary quantitative data was triangulated with information collected through secondary sources and service providers.

1 CGAP: http://www.cgap.org/sites/default/files/interoperability.pdf

2 Financial Technology Africa: https://www.financialtechnologyafrica.com/2017/05/08/kenyan-to-start-mobile-money-interoperability-in-july/

Findings

(i) Demographic and socio-economic characteristics of users and agents

End-users: The majority of the end-user respondents – 63% – were male.[3] Regarding age, 45% were in the 25-34 category and 31% were between 18 and 24 years old. The mean and median age were 29 and 28 respectively. Ninety-eight per cent had attained formal education, with 17% and 22% having completed secondary and tertiary levels respectively. Eighty-three per cent were able to read and write in English. Around 57% were self-employed in non-agricultural or retail trade services, and 23% were employees in the private sector. end-user Forty-five per cent earned between UGX 100,000 and UGX 300,000 per month.

Agents: The majority (61%) of agents were female, with an average age of 26 years and with 63% operating their businesses in urban areas. Most had attained formal education, with 33% having completed secondary education 24% having obtained tertiary education certificates. Almost all (98%) were able to read and write in English.

(ii) Mobile money current and potential users

Experiences with mobile money services

Among the 2,000 end-user respondents interviewed, 98% owned a mobile phone, with 24% owning more than one. For those without a phone, reasons cited for not owning one included borrowing one from a household member, not having the money to buy a handset, or a previous handset having been stolen or lost. The majority of SIM card owners were connected to Airtel (77.9%) or MTN (70.2%), with 48.6% owning both Airtel and MTN SIM cards. The most common uses for mobile phones are making voice calls (99.4%) and mobile money services (91.6%).

Almost all respondents had heard of mobile money services, and of these, 69% and 68% were subscribed to Airtel and MTN respectively (with 38.8% registered for both Airtel and MTN). Mobile money services are mainly used for sending money (93%) and receiving it (92%). Just above a quarter of the respondents (26%) said they save using mobile money features. Of all respondents, 78% had used MTN at least once to carry out a financial transaction using mobile money, while 75% had used Airtel. Only 2.6% and 2.4% had ever used Africell or UTL respectively. Of those who send money using MM services, 49% use their own wallet, while 2% use that of a household member. Forty-nine per cent use agents. With regards to receiving mobile money, 91% do so using their own wallet, while only 5% and 4% advise senders to transfer to the agent or family member respectively.

The majority (57%) of end-users interviewed were aware of the ability to transfer money across networks, but only 18% had ever sent money to, or received money from, another person subscribed to a different service provider. MTN and Airtel account for 94.2% of the cross-network transactions carried out by those who performed such a transaction. In 56% of cases, the money was received through a voucher system, while in 42% of cases it was received directly into a wallet. The biggest challenge to the transacting across networks is the perceived high cost of it, with 96% of those who carried out cross-network transactions saying it was very expensive to do so.

Hindrances when sending and receiving money across networks

The most common hindrances were:

- Sending or receiving across networks is more expensive than when sending to or receiving from same network (90%)
- Being forced to visit an agent instead of doing other work, and thereby losing time (26%)
- Failing to be served because the agent was registered to a different service provider (38%). Of these, 64% said the agent didn't have enough e-float and 63% indicated that the agent did not have enough cash on hand.

Demand for interoperability among end-users

Users of mobile money appreciate the need for interoperability. Nearly all respondents indicated sending (98%) and receiving (97%) money across networks (off-net) as being important or necessary. Almost all end-users were

3 The data was not weighted to the estimated population by sex and gender. The results presented depict the characteristics of the sampled respondents.

willing to send (96%) and receive (97%) across networks and 69% were willing to pay slightly more for these services than they would do for transactions on the same network. They did feel, however, that this cost should be less than it currently is. Based on these findings, we can conclude that the demand for interoperability among end-users is high.

Furthermore, most users (over 97% of respondents) are willing to cash-in and cash-out at agents, and 70% are willing to pay for the service if interoperability is fully implemented.

(iii) Mobile money agents

Business operations

The mobile money industry is largely shared between two service providers. Ninety-six per cent and 82% of the sample agents interviewed were subscribed to MTN and Airtel respectively. Only 3% were subscribed to Africell, while less than 1% were subscribed to UTL. The industry has seen a growth in the last few years of the number of MM outlets, with 73.6% of the agents interviewed saying they had started their businesses within the last three years. The most common services carried out by the agents are depositing money in customers' wallets (99%) and paying cash when clients are withdrawing (98%). About 59% and 38% of the agents send and receive cash respectively. Agent outlets are open almost the entire week, serving an average of 25 customers per day.

Experience with buying e-float

Super-agents are mostly used when replenishing e-float; 61% of this use is by agents and 43% is by banks. Just over half (55%) of the agents reported that they had asked their fellow agents to send them e-float. Agents who are registered with more than one service provider are more likely to use the bank than those who are registered with one service provider. The choice of where to replenish from is driven by the distance between the agent's point of sale and the source of the e-float purchase. The most common costs incurred by the agent when replenishing e-float were transport (44%) and bank charges (35%), while 29% of agents reported that they do not incur any expenditure.

Besides the cost, the major effects of running out of e-float are loss of business to other agents (as reported by 82% of agents) and failing to serve a client due to lack of e-float at the respective service provider (76%).

Demand for interoperability

The majority (88%) of agents think it is useful to enable e-float transfer across networks, and to use one float to serve all networks (to allow agents to perform cash-in cash-out transactions across networks). Furthermore, most agents (93%) are willing to transfer e-float or use one e-float to conduct CICO transactions (92%) across networks. However, unlike end-users, the majority (67%) of agents were not willing to have their commission reduced as a result of transferring e-float or using a single e-float for cross-network CICO transactions. The demand for interoperability, therefore, is high among agents. It is driven by the need to serve all customers, but it can be negatively affected if commission is charged.

Conclusion

Based on the findings of the research, the following conclusions were made:

- **a** Most of the respondents use MTN and Airtel as their mobile money service providers, with these networks serving around 80% of total end-users. Respondents were more or less equally distributed among these two operators. This emphasises the need for interoperability in mobile financial services.
- **b** The cost of off-net transactions is the major hindrance caused by lack of interoperability. This problem is preventing increased uptake of mobile financial services and thwarting financial deepening in the country. When it comes to converting e-money to cash, and vice versa, at an agent, the majority of end-users have at some point failed to be served because of either lack of sufficient e-float or cash on hand. The major inconvenience caused by this is spending more time to reach another agent.
- **c** The demand for interoperability in mobile financial services by mobile money users is high, both for transferring money across networks and for cash-in and cash-out at agents. This is demonstrated by the willingness of mobile money users to perform transactions across networks and their readiness to pay for the service if fully interoperable systems are put in place. Such systems require the establishment of

working arrangements (a memorandum of understanding), agreement on a sustainable and affordable pricing system, and the installation of a secure platform to process cross-network transactions.

d When deciding where to replenish e-float, the majority of agents base their choices on the distance from their PoS to the source of the e-float purchase. The main cost incurred by agents is that of transport. The majority also believe that it is useful to implement interoperability either through enabling the transfer of e-float across networks or by using a single e-float for all networks. Most agents are willing to use the facility if implemented, but a willingness to pay for this service is lacking.

e Interoperability should be implemented using a phased approach. This should start with the two major service providers, who have already begun working on the technical infrastructure. Such an approach would minimise the length of negotiations, which would be much longer if all service providers were brought on board simultaneously. An enabling environment should, though, be created, to allow other mobile money service providers to eventually join the arrangement.

1. INTRODUCTION

Across the world, interoperability – the ability for different systems to connect with one another – is attracting a high level of attention among digital finance experts.[4] Service providers see interoperability as a business opportunity, while development agencies and governments consider it as a tool for improving financial inclusion.. Uganda is no an exception to this. Key stakeholders in mobile financial services, including Financial Sector Deepening Uganda (FSDU) and Bank of Uganda (BoU), have recognised that interoperability in financial services is critical to the adoption of digital financial services in the country. Some service providers, furthermore, have made efforts to explore how they can work together. As a logical step to implementing interoperability in mobile financial services, FSDU – in collaboration with BoU – commissioned market research to understand the latent demand for such interoperability in the Ugandan market. This document presents the findings of that study.

For the purpose of this research, interoperability is defined as moving money between different networks or service providers (both telecoms and non-telecoms).

1.1. Background

Financial Sector Deepening Uganda is an independent, not-for-profit company committed to promoting greater access to financial services in Uganda. FDSU's objective is to create a deeper, broader and more inclusive financial sector, with a focus on low-income individuals (particularly women) and micro, small and medium enterprises (MSMEs). Through supporting innovation, conducting research and improving policy, FSDU recognises the key role interoperability can play in deepening financial services. According to the 2013 FinScope Survey, the population of financially excluded adults in Uganda decreased from 4.3 million (30% of all adults) in 2009 to 2.6 million (15% of all adults) in 2013, with the majority using non-bank formal financial services (34% in 2013). The strong growth in use of non-bank formal financial services is mainly attributed to the use of mobile money transfer services. An estimated 5.1 million adults used such services in 2013. However, the Financial Inclusion Insights report, which provides the most recent demand-side data, puts the percentage of adults who use Mobile Money services at around 33% for 2014 and 35% for 2015, indicating a slight stagnation in active usage over the past three years. While other factors (e.g. poor infrastructure, long periods of system downtime and a high rate of fraud) could account for the slow uptake of digital financial services (DFS) in Uganda, lack of interoperability – as in many other developing countries – has the potential to impede growth. For example, if potential mobile money users cannot make essential payments or receive much-needed money due to lack of interoperability, they will not be incentivised to register with mobile money service providers. This, in turn, will impede financial deepening. This problem prompted key stakeholders to commission this market research. It is aimed at understanding the demand for interoperability in mobile financial services, with a view to encouraging service providers to take advantage of the business opportunity at their disposal while simultaneously promoting financial inclusion. According to the CGAP working paper, Digital Finance Interoperability & Financial Inclusion: A 20-Country Scan, for interoperability to be effective three functional elements – arrangement governance, business model and technical integration – must come together. This market research focuses on the business model, in order to ascertain whether there is demand for interoperability. If there is, service providers can justify entering into governance arrangements and investing in technical integration infrastructure.

1.2. Interoperability in mobile financial services in Uganda

Due to a lack of fully interoperable systems in Uganda, service providers have used coping mechanisms to facilitate the transfer of money across networks by mobile money users, and to allow agents to cash-in from, and cash-out to, clients registered with different service providers. Mobile money users send e-money across networks using a voucher system. Users receive an SMS indicating that they have been sent money, and that if the money is not withdrawn within three days, it will be returned to the sender. The system requires the recipient to visit and withdraw cash from an agent with an e-float of the sender's service provider, before funds are routed back to the sender. This process takes time and often costs the user money. Lack of interoperability also affects agents. They are forced to use multiple e-floats for different networks in order to serve clients, and this leads to difficult decisions as to how much e-float to load and maintain for each network. MTN and Airtel do provide the

4 Digital Finance Interoperability & Financial Inclusion: A 20-Country Scan, Consultative Group to Assist the Poor (CGAP)

option of sending money across the two networks directly to a user's wallet. However, this facility is relatively expensive compared to on-net (same network) transfer.

1.3. Market research scope and objective

The objective of this market research was to understand the latent demand for interoperability in mobile financial services in Uganda. This demand-side research focused on two types of interoperability consumer: mobile money/non-bank mobile financial services users, and mobile money agents. Specifically, the research aimed to help stakeholders to:

i. Ascertain whether there is a need for interoperability among users, non–users and agents of mobile financial services

ii. Ascertain hindrances encountered due to lack of interoperability

iii. Identify some of the existing or potential costs that the various segments (particularly agents) bear because of not having interoperability in mobile financial services

iv. Ascertain clients' willingness or propensity to pay for interoperability.

The research covered both current and potential users of mobile money/non-bank mobile financial services, in order to ascertain the perspectives of both existing and potential users and hence to enable service providers to both enhance usage and attract new users. Respondents included people who owned mobile phone and people who did not; people who owned SIM cards and people who did not; and people registered with mobile money service providers or people who were not. In terms of agents, the research covered active agents only, since it was difficult to identify respondents who were likely to become agents in the future. The research investigated two types of transaction sets: peer-to-peer (P2P) transfer, and cash-in deposits and cash-out withdrawals at agents (CICO).

The P2P transfer had three scenarios, indicated in the table below, (in which 'Mobile Network Operator (MNO) wallet' refers to personal and other non-bank registered mobile money users, and 'Third party wallet' refers to non-telecom mobile money users):

Table 1: Transfer scenarios

Scenario	From	To
1	MNO wallet	MNO wallet/voucher
2	MNO wallet	Third party wallet
3	Third party	MNO wallet

However, based on the fact that usage of the third party wallet was very minimal and would not allow reliable conclusions to be drawn, analysis was conducted only for the first scenario.

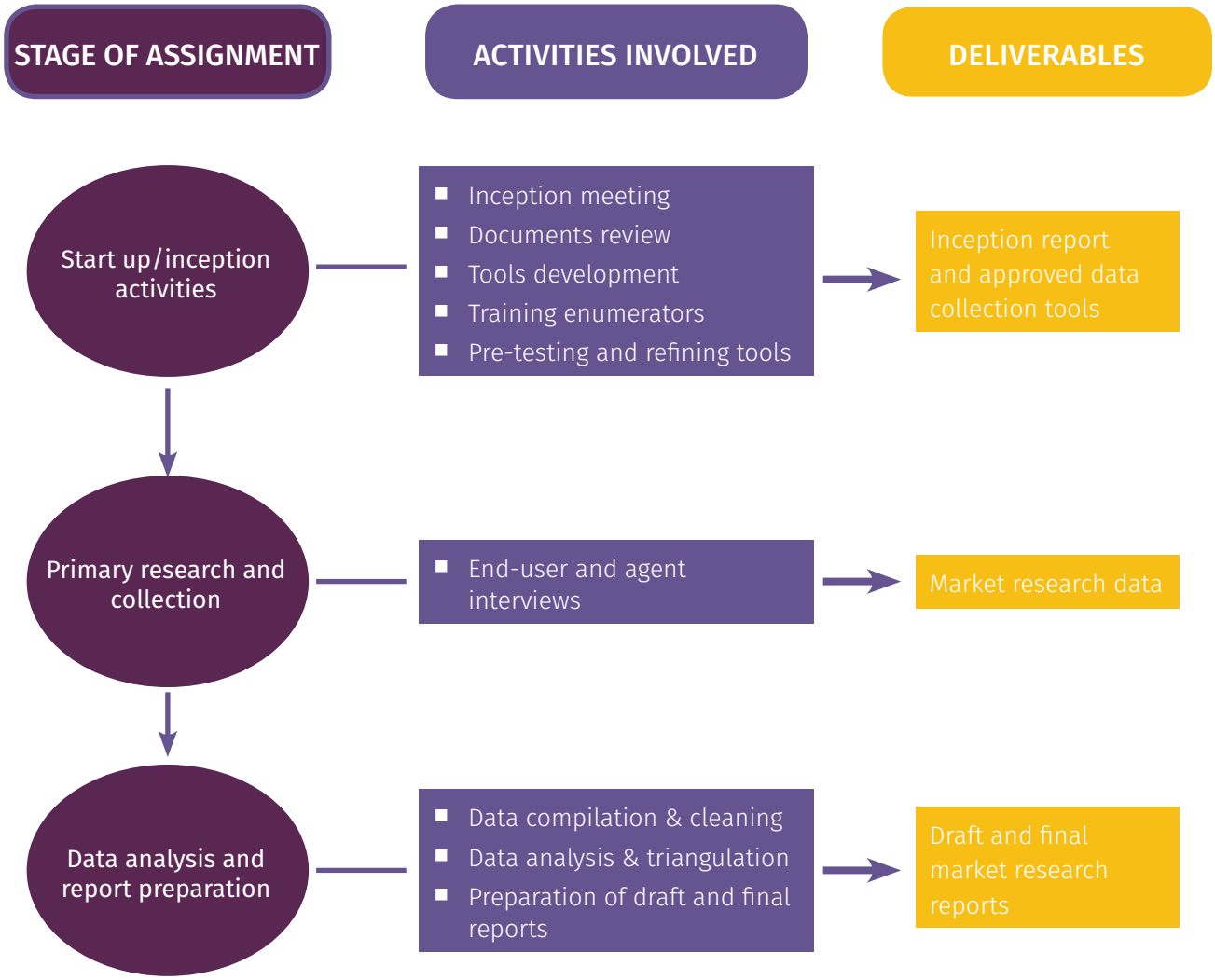
Cash-in deposits involve mobile financial services users depositing cash with the agent. The agent then credits money on the client's wallets. Cash-out deposits involve withdrawing cash from an agent. The agent then debits money on the client's wallet.

1.4. Study approach and methodology

The study adopted a logical flow for the implementation of activities that were carried out. The study design focused primarily on the quantitative methods for data collection, in addition to a desk review of relevant literature and occasional observations.

1.4.1. Work approach

The diagram below illustrates the steps taken to implement the study.



Below is a brief description of each stage of the assignment that was undertaken. More detailed descriptions are given in further sub-sections.

Start-up/inception activities: The aim of this phase was to develop a deeper understanding of the assignment; its scope, expectations and deliverables. Furthermore, it was at this stage that preparations for fieldwork were done. This involved conducting inception meetings with FSDU, a review of relevant documents, the designing of data collection tools, the development of the methodology, a pre-test of tools and the training of research assistants. The outputs were the inception report, survey tools and pilot data.

Data collection: This involved carrying out interviews with selected respondents – the mobile money end-users and mobile money agents. It was at this phase that data was captured for processing.

Data analysis and report writing: Data was processed and triangulated with secondary information obtained from document reviews. The results have been presented in reference to the report outline agreed upon with FSDU. This final report is a result of incorporating comments received from FSDU and stakeholders following the submission of the draft report.

1.4.2. Sampling design

The study was conducted across the country, covering 17 districts[5] from five regions: western, northern, eastern, central and Kampala. The respondents were drawn from both urban and rural areas. The distribution of respondents between these types of area was informed by a 2013 FinScope study that indicated that usage of mobile money services in urban areas is high compared to rural ones. The sample sizes for end-users (potential and current users) of mobile money services and mobile agents were determined using the formula below:

$$n = \frac{Z^2 p(1-p)}{e^2}$$

Where:

Z = 1.96 (95% confidence level)

p = 0.5 (probability of respondent)

e = 0.0219 for end-users and 0.0438 for agents (margin of error)

Using the formula n=20022000 for end-user and n=501500.

A sample size of 2,000 end-users (potential and current users) of mobile money services and 500 mobile agents were used for the survey. The sample for the end-users was proportionately distributed by region and district based on the projected population estimates as well as mobile money usage. The sample covered both urban and rural areas, based on the results related to mobile money usage from the FinScope 2013 study. The respondents comprised both male and female end-users, who were selected randomly at household level or by their respective places of work. The agents included owners and attendants of established mobile money businesses/kiosks. The distribution of the sample by region and district is as presented in the table below:

5 Luwero district replaced Iganga district for mobile money end-users, as indicated in section 1.4.6.

Table 2: Achieved sample by region and district

Region	District	End-user	Mobile money agents
Kampala	Kampala	463	102
Central	Wakiso	420	108
	Mukono	118	32
	Mubende	144	37
	Masaka	51	16
	Luweero	74	-
Eastern	Iganga	-	20
	Mayuge	101	21
	Mbale	80	20
	Soroti	49	12
Northern	Gulu	51	12
	Lira	44	12
	Nebbi	42	11
	Arua	85	22
Western	Mbarara	83	22
	Bushenyi	42	11
	Kabarole	80	22
	Kyenjojo	73	20
Total		**2,000**	**500**

Source: *survey data*

1.4.3. Development and pre-testing research tools

The survey data collection tools were designed and developed in line with the report plan and objectives of the research. The tools, designed so as to logically feed information into the report outline for analysis, were used to collect relevant data for the market research. Questionnaire tools were developed for both end-users and agents. The first draft tools were shared with FSDU, whose comments were referred to during revisions. Similarly, the final draft tool was shared with, and approved by, FSDU before training and data collection commenced. During training, the tools were pre-tested and piloted by the field research assistants, to ascertain the logical flow of the questions, gain an in-depth understanding of them, and determine their reliability in answering the research objectives.

Although the tools were not translated into the local languages of the ethnic groups within the selected districts, the research assistants were able to develop translations to be used during data collection. This strategy reduced the errors that would have occurred as a result of incorrect translations during administration of the interview. For the final versions used during data collection, see Appendix I.

1.4.4. Survey team and organisation

The survey team was made up of the technical team and the field team. The technical team constituted the team leader, technical advisor and the statistician, while the field team was made up of field supervisors and enumerators/interviewers.

The team leader was responsible for the overall guidance of the survey. This involved ensuring that the agreed deliverables were submitted, staying abreast of day-to-day study activities and resolving problems that arose. The team leader also participated in the refining of tools, the training of enumerators and the supervision of fieldwork, as well as overseeing the production of the analytical report. The technical advisor provided insights, advised on certain questions and oversaw the overall research implementation strategy. The statistician advised

on the methodology and survey design as well as data analysis. The field supervisors oversaw the enumerators by allocating work, implementing quality control measures, providing regular updates to the technical team and introducing the field team to the relevant authorities. The enumerators were primarily responsible for identifying and randomly selecting respondents, and conducting the interviews with them. The field team was organised into four groups of enumerators, each led by a field supervisor.

The technical and field teams were supported by the administrative staff of FCL, led by the operations manager and assisted by the project manager and finance officer.

1.4.5. Data collection, processing and analysis

Field team training:

In preparation for data collection, field research assistants took part in a three-day training course. This was facilitated by the survey team leader and the statistician. The assistants were trained on both sets of the questionnaires, focusing on the objectives of the survey, expectations, translations and methodology. A pilot was conducted to enable the field team to acquaint itself with the tools and methodology, as well as to help them identify any challenges they might face in the field.

Data collection approaches:

For data collection, the research employed quantitative methods of data collection coupled with a literature review. The review aimed to give the research technical team an in-depth understanding of the concepts related to mobile money and interoperability, and to help them develop appropriate survey tools and a sound methodology. Below is a list of documents reviewed:

- FinScope reports (2007, 2010, 2013)
- Digital Financial Services: Financial Inclusion Insights (reports by Intermedia)
- CGAP reports on financial inclusion for the poor.

During primary data collection, the field team was organised into four groups. Each comprised one supervisor and between seven and nine enumerators, and was deployed according to language spoken. Members of the technical team also participated in data collection by supervising the field team in the different regions. CAPI, rather than PAPI, was used for the interviews, with the script designed in Survey CTO and uploaded on the tablets. Each enumerator was given a tablet.

Fieldwork was carried out over a period of 12 days. During the first six days, the team completed interviews in Kampala, Mukono and Wakiso. During the following six days, the travelled upcountry. On any given day, the field supervisor allocated work to each enumerator based on the number of interviews to be completed and the required area of coverage. On a daily basis, the field supervisors updated the members of the technical team on progress, any challenges faced and plans for the next day(s).

Data processing and analysis:

Each evening the collected data was uploaded onto a central server at FCL and downloaded by the data analyst for review. The analyst also carried out checks to identify any errors. The cleaning process was carried out using SPSS statistical software. Similarly, the generation of statistical tables was carried out using SPSS, in line with the report plan. Primary quantitative data was triangulated with information collected through secondary sources and service providers.

This final report has been written as per the agreed report plan and the requirements of FSDU.

1.4.6. Quality control procedures

The following quality control procedures were implemented to ensure that the data collected met the objectives of the research and the expectations of FSDU:

a A competent and experienced field team of research assistants was recruited and thoroughly trained on the objectives, questionnaires and overall requirements of the research. Role plays, demonstrations and pilots were carried out to enable the trainees to gain the required skills. Research assistants were deployed based on language spoken.

b The roles of each participant involved in the study were clearly explained, which enabled each person to fully understand their contribution. This helped to minimise any friction that might otherwise have been created between team members.

c Members of the technical team and the field supervisors carried out back-checks, spot-checks and accompaniments during data collection to ascertain and verify the quality of interviews conducted. Further back-checks of completed interviews were carried out by a team of quality controllers at the office.

d Data was always downloaded and checked by the data analyst to ascertain the degree of errors made and to inform the respective team members in time. Further data checks were also carried out before the generation of analytical tables.

1.4.7. Limitation of the survey

The market research was a success. carried out. There were, however, challenges encountered during the survey that are worth noting in order to help guide future studies of this nature. Some mobile agents were not receptive to the research assistants because of a suspicion of potential fraudsters. This problem was addressed by simply finding another agent who was willing to provide information, though this approach ended up being costly in terms of both money and time. For example, as a result of non-cooperative agents in Iganga District, interviews for mobile money end-users earlier targeted for Iganga were conducted in Luwero District (which has similar characteristics). To alleviate this issue, deeper scanning of the study environment should take place, especially if there are past/recent events that may cause tension among the respondents.

2. CONTEXTUAL ANALYSIS OF THE TARGETED MARKET

This section presents a contextual analysis of the targeted market; end-users of mobile money services, and mobile money agents. It primarily focuses on the demographic and socio-economic characteristics of the targeted market, types of businesses operated and mobile money networks operating in the country.

2.1. Characteristics of end-users and agents

2.1.1. Demographic characteristics

Table 3 presents the demographic characteristics of the end-user respondents. The majority (63%) of the end-user respondents were male.[6] With regards to age, 45% of the respondents were in the 25-34 category, with a mean and median age of 29 and 28 respectively. The age distribution of respondents is of a pyramidal nature. This is similar to that of the population as a whole, even though the data was not weighted as such.

The majority of the respondents (98%) had obtained some kind of formal education, with 74% having attended secondary school and 22% having completed tertiary education.

Table 3: Demographic characteristics of end-users

Characteristic	Total	Male	Female
N	2,000	1,261	739
Gender	100%	63%	37%
Age			
18-24 years	31%	29%	32%
25-34 years	45%	45%	46%
35-44 years	17%	18%	15%
45-54 years	5%	6%	5%
55 years and above	2%	3%	1%
Mean	Mean=29	Mean=30	Mean=29
Median	Median=28	Median=28	Median=27
Able to read and write			
Yes	83%	84%	81%
No	17%	16%	19%
Highest level of education			
None	2%	2%	2%
Did not complete primary school	12%	11%	12%
Completed primary school	9%	10%	8%
Completed post-primary specialised training	3%	3%	2%
Completed post-ordinary level specialised training	7%	5%	9%
Did not complete secondary education	28%	29%	28%
Completed secondary education	17%	18%	16%
Completed tertiary education	22%	21%	22%
Other specified	1%	0%	1%

Source: survey data

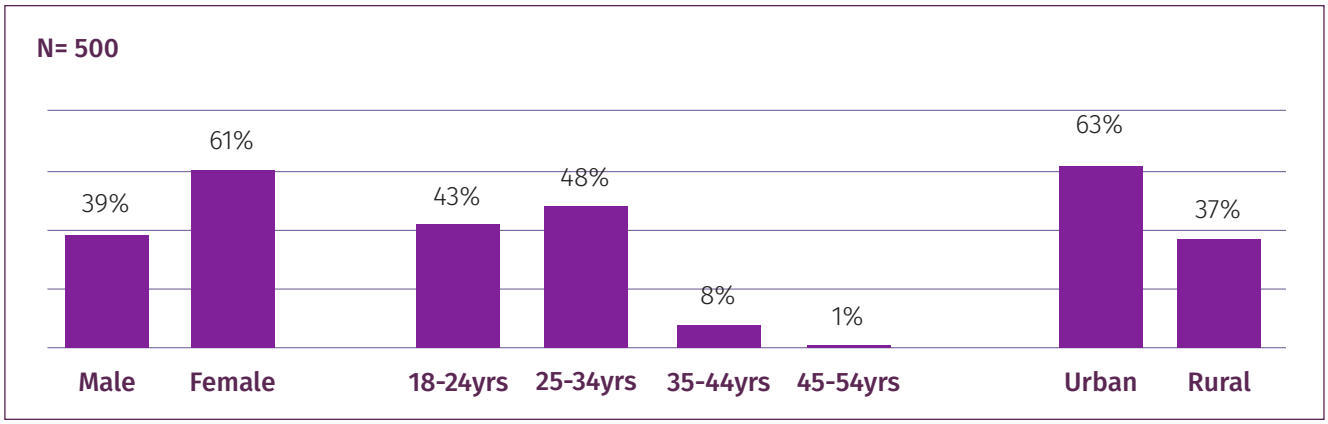
6 The data was not weighted to the estimated population by sex and gender. The results presented depict the characteristics of the sampled respondents.

A significant proportion (83%) of the respondents were able to read and write in English. There was a slight variation by gender here, with the male respondents (84%) more likely to read and write than their female counterparts (81%).

Figure 1 shows the distribution of selected demographic characteristics of mobile money agents/operators. The majority of the agents or MM businesses surveyed were located in urban areas (63%). MM businesses were more likely to be operated or staffed by women, who comprised 61% of the sampled respondents. Nine in every ten of the sampled MM agents were aged between 18 and 34.

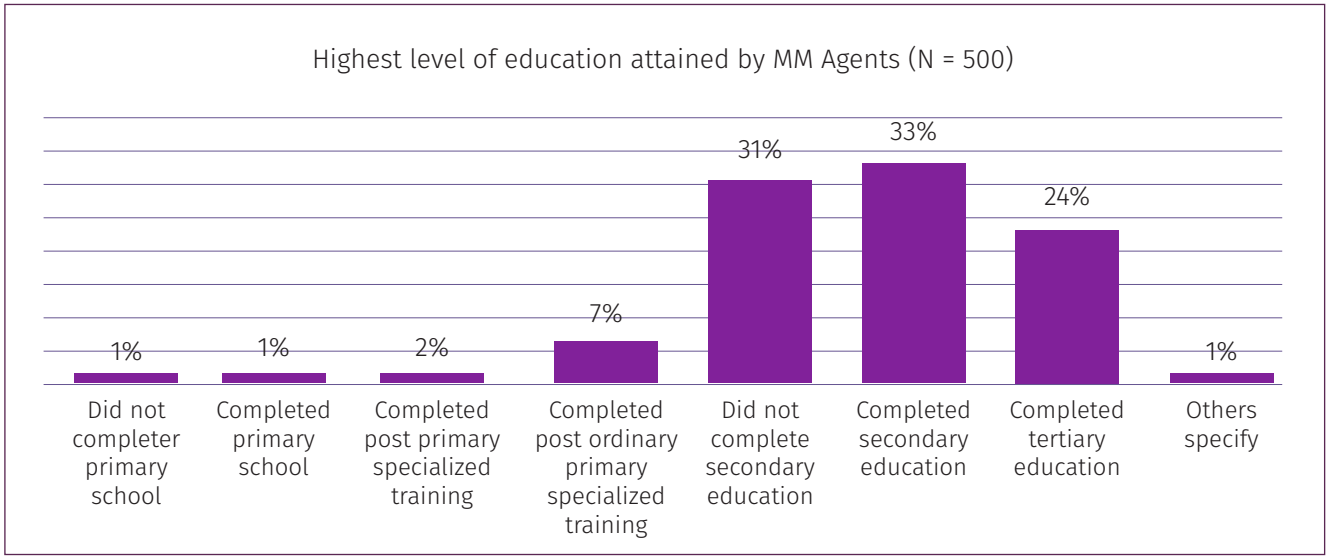
The results also reveal that 98% of the MM agent respondents were able to read and write in English. This correlates positively with the information about their highest level of education, with the majority having attained some secondary education (64%) and 24% having completed tertiary education (as shown in Figure 2).

Figure 1: Distribution of age, sex and setting characteristics of MM agents



Mean age=26 yrs, median age =25 yrs

Figure 2: Highest level of education attained by MM agents



2.1.2. Employment and income status

Table 4 shows that self-employment in non-agricultural activities (27%) and employment in the private sector (23%) were the two most common sources of livelihood for the end-user respondents that were sampled. With regards to monthly income, survey findings reveal that 45% of the respondents earn in the range of UGX 100,000 to UGX 300,000, while by 22% earn below UGX 100,000 and another 22% earn above UGX 350,000.

Table 4: Employment and income status of end-users

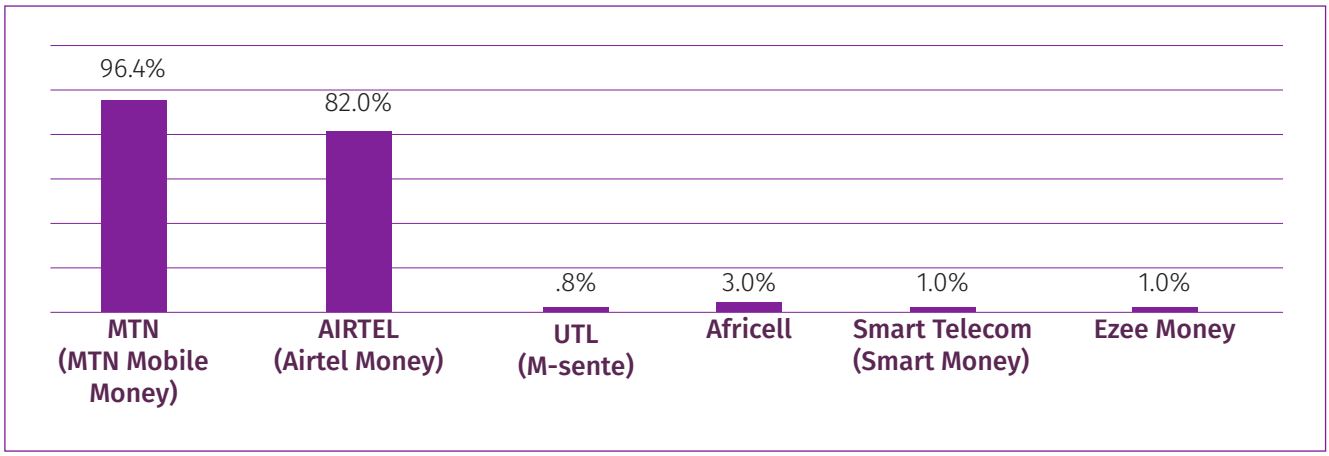
Characteristics	Total	Male	Female
N	2,000	1,261	739
Employment status			
Self-employed non-agriculture – services	27%	29%	24%
Employed, working for employer in the private sector	23%	22%	24%
Self-employed non-agriculture – retail	20%	18%	24%
Hustle in informal economy	6%	8%	4%
Other specified	6%	7%	4%
Unemployed and supported by relatives and friends	5%	4%	6%
Dependent	4%	3%	6%
Other	8%	9%	7%
Monthly income			
10,000 - 50,000	9%	7%	12%
50,001 - 100,000	13%	12%	13%
100,001 - 150,000	12%	12%	13%
150,001 - 200,000	13%	13%	14%
200,001 - 250,000	10%	10%	9%
250,001 - 300,000	10%	10%	9%
300,001 - 350,000	6%	6%	6%
Above 350,000	22%	24%	16%
Refusal	3%	3%	3%
Don't know	4%	4%	5%

2.2. Characteristics of mobile money businesses and services provided

MM agents by service providers

Since their introduction in 2009, of the number of mobile money service providers has gradually increased. The market share, however, is unevenly distributed. It is evident from Figure 3 that there are two major players in the mobile money industry: MTN and Airtel. They serve 96% and 82% of agents respectively. The results also reveal that there is high level of multi-usage, with 79% having registered to more than one service provider (78% are subscribed to both MTN and Airtel). The results for MM agents correlate positively with the findings from the end-user survey, which also indicates that MTN and Airtel are the two most commonly used providers. Levels of registration with other MM service providers are very low. It is, though, notable that Africell, a relatively new entrant in the market, seems to have more agents registered than UTL, a more established operator.

Figure 3: MM agent by service providers



N=500 MM Agents

The above results echo those of a similar study published on the Uganda Business News website (http://ugbusiness.com/1297/airtels-share-of-mobile-money-agents-grows-but-still-behind-mtn). This showed that both MTN and Airtel account for 99% of the MM market, with the former leading at 57% followed by the latter at 42%. These figures imply that because of the lack of interoperability, agents feel they must register with more than one service provider in order to reach the available market. It is also important to note that, given their dominance of the market, MTN and Airtel have the power to either push strongly for greater interoperability or to ignore it.

Age of business

An analysis of the age of the MM businesses reveals that around two in five (39.4%) were established in the 12 months prior to the survey being conducted, with 30.8% being between 25 and 60 months old (as shown in Table 5 Below). Further analysis shows that 73.6% of the businesses were established in the last 36 months (or three years).

Table 5: Age of MM businesses

Duration	Total	Urban	Rural
N=	500	315	185
0 to 6 months	19.8%	18.7%	21.6%
7 to 12 months	19.6%	21.0%	17.3%
13 to 24 months	18.4%	18.1%	18.9%
25 to 36 month	15.8%	15.9%	15.7%
37 to 60 months	15.0%	13.7%	17.3%
More than 5 years	11.4%	12.7%	9.2%

Source: *survey data*

These results are a reflection of how the mobile money industry has been growing over the last five years. According to Ssettimba (2011)

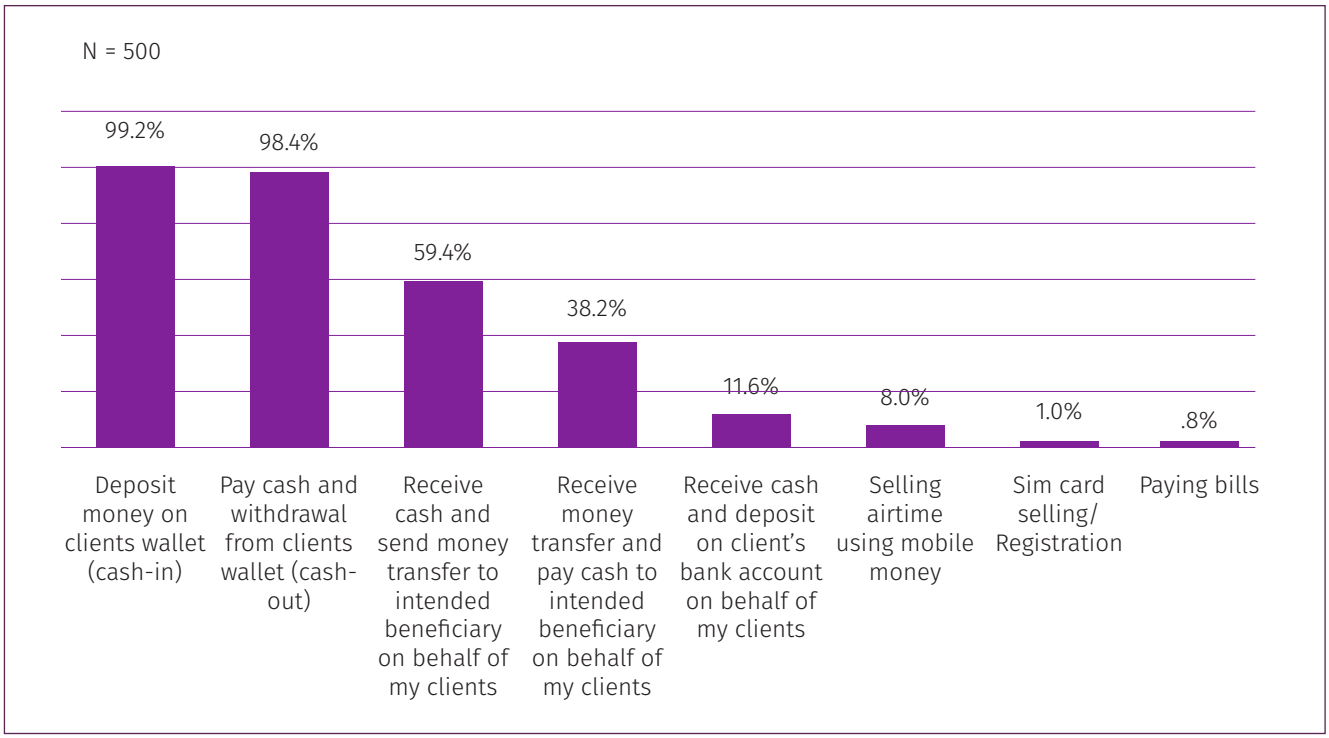
- Registered customers for MM services increased from 2.9 million in 2011 to 8.9 million in 2012, 14 million in 2013, 18.5 million in 2014 and 21.1 million in 2015
- The number of transactions increased from 88 million in 2011 to 693 million in 2015
- The value of transactions increased from UGX 3.8 billion in 2011 to UGX 32.5 billion in 2015.

The increase (an average of 4 million customers per year between 2012 and 2015) in subscription led to a greater demand for mobile money sales outlets It is not, therefore, surprising that the majority of the MM businesses surveyed had been set up within the last three years.

Services offered by agents

Cashing-in and cashing-out on a client's wallet are the two most common services offered by the MM money agents. This is in line with regulations set by the MNOs, which require that agents are only allowed to transact directly on the wallet of a client who is physically present at the point of sale. However, the study also found that significant proportions have broken these regulations by sending or receiving money on behalf of a client who is not physically present (see Figure 4).

Figure 4: Services offered by MM agents



In-depth discussions with some of the MM agents revealed the scenarios in which they may send or receive money on behalf of the client:

- When the client is of a different MM wallet to that of the recipient (when sending on behalf of client) or sender (when receiving on behalf of sender)
- When the client is not registered for MM or does not own a SIM card
- When the client does not have enough money in the MM account from which the costs of sending or withdrawing will be deducted.

For all the above scenarios, the agent charges a fee, which is illegal, for the services offered. The first scenario above might be a proxy indication of the need for interoperability; the client is not willing to waste more time by looking for another agent registered to the same service provider as them.

Days of operation and average number of customers served

On average, mobile money agents work almost the entire week (6.6 days a week) with no significant differences observed between urban and rural areas. Table 6 shows that the average number of customers served daily is 25, with a significant variation between urban (26) and rural (22) areas. However, 33.4% of agents serve between 11 and 20 customers daily.

Table 6: Number of customers served daily

Number of customers served	Overall (N=500)	Urban (N=315)	Rural (N=185)
1 to 10	11.0%	9.2%	14.1%
11 to 20	33.4%	30.5%	38.4%
21 to 30	25.6%	26.7%	23.8%
31 to 40	16.4%	17.8%	14.1%
41 to 50	6.4%	6.3%	6.5%
Above 50	7.2%	9.5%	3.2%
Mean	25	26	22

Source: survey data

3. THE MARKET RESEARCH FINDINGS

This section presents the findings of the study. It covers the experiences of respondents, problems caused by lack of interoperability and the demand for interoperability among end-users and agents.

Key findings include:

i. MTN and Airtel are the most frequently used mobile money service providers. Of all respondents, 78.4% currently use MTN and 74.5% use Airtel. Just over half had used both MTN and Airtel.

ii. The main barrier to transferring money off-net is cost. The time taken to visit an agent was also often cited as an issue. Just over 90% of the 1,471 people who sent money and 83.7% of the 1,366 respondents who received it said that it is more expensive to carry out transactions off-net than on-net. Just over 26% of both senders and receivers said that the time taken to visit an agent was an issue. These problems are preventing increased uptake of mobile financial services and thwarting financial deepening in the country.

iii. Demand for interoperability by end-users in mobile financial services is high, as demonstrated by their willingness to transfer money across mobile networks and to pay for the service if fully interoperable systems were put in place. Most users (over 96% of the respondents) were willing to send/receive money (use the facility) and 69% were willing to pay (slightly more than the current charge for on-net transaction) if interoperability was fully implemented. This finding is also supported by fact that 42% of the registered MM users had multiple registration, which was partially to enable them to send money to, or receive it from, users on different networks.

iv. The majority (over 63%) of mobile users have at some point failed to be served. This was largely due to either lack of sufficient e-float or of cash on hand. Just over 38% of respondents had experienced such a failure because the agent was registered with a different service provider. The results also show that the major inconvenience caused by failure to be served is spending more time to reaching another agent. Over 85% of the respondents citing this in the case of both lack of sufficient e-float and cash on hand.

v. Demand for interoperability by end-users at cash-in and cash-out points is high. This is demonstrated by the willingness of 70.4% of respondents to pay slightly more for an off-net transaction than they currently do for an on-net transaction, if off-net and on-net users are served by any agent irrespective of the mobile network that has provided the float.

vi. The majority of the agents are registered to MTN (96%) and Airtel (82%), with 79% being multiple users (78% of whom are subscribed to both MTN and Airtel).

vii. Over 66% of agents decide where to replenish e-float based on the distance from their PoS to the source of the e-float purchase. The major cost to agents in this case is for transport, as indicated by 64% of those who use 'only bank' and 40% of those who use 'only super-agent'. Eighty-two per cent of agents reported loss of business from potential clients as the main effect of lack of e-float. Enabling the transfer of e-float across networks through interoperability, or using one float for all networks, would go a long way to addressing agents' concerns.

viii. The majority (88%) of agents think it would be useful to implement interoperability either through enabling the transfer of e-float across networks or by using one e-float for all networks. Over 93% of agents indicated they would be willing to use such a facility if implemented. However, the challenge of operationalising interoperability lies in the fact that 67% of agents are not willing to meet the cost of improved services. Among multiple users, 89% think it is useful to transfer across networks.

3.1. Current end-users and potential users

The study covered two transaction sets that need interoperable systems to improve mobile financial services delivery. However, before presenting the results, it is useful to present the experience of the target market (potential and current mobile financial service users) with mobile phones and mobile money services, in order to provide the contextual environment within which interoperability would be implemented. The experience of users with mobile phone and mobile money services was analysed in terms of access, ownership and usage.

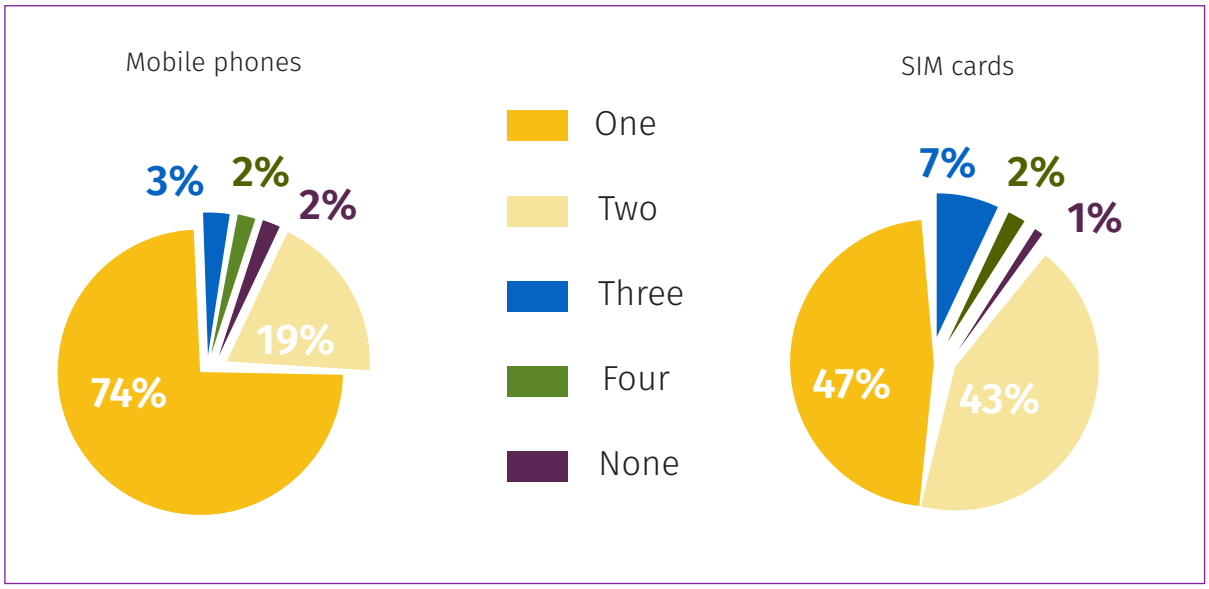
Access, ownership and usage of mobile phones

Of the 2,000 respondents, 98.4% own mobile phones with 24% owning more than one. Only 1.4% did not own a phone. Among the latter group, 51.6% stated that they used a family member or friend's phone, and 16.1% indicated that they had once owned a mobile phone but had lost it or had it stolen. Just under 10% reported that

they did not have money to buy a phone. It is important to note that even though 31 respondents did not own a phone, 83.9% of them could access one through family or friends. Figure 5 shows the proportion of respondents owning mobile phones and SIM cards.

Only 1% did not own a SIM card. The 99% ownership of SIM cards emphasises the high penetration of mobile phones and high levels of access to them.

Figure 5: Proportion of respondents owning mobile phones and SIM cards



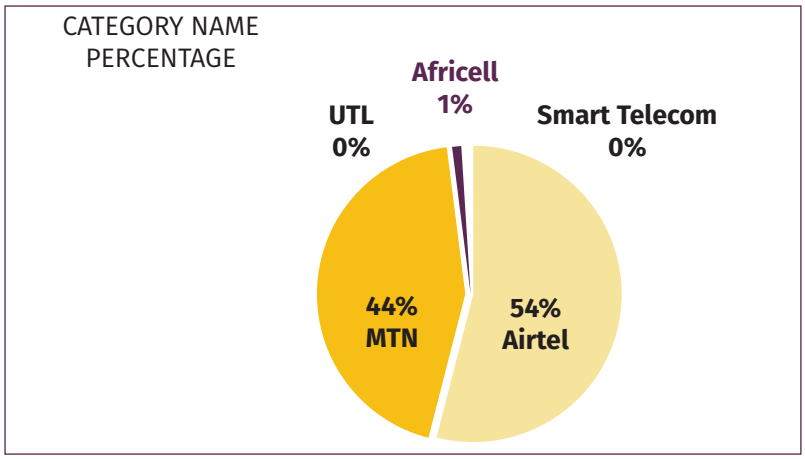
The study revealed that most of the people in Uganda use either Airtel and/or MTN as their service provider, with 77.9% of respondents owning an Airtel SIM and 70.2% owning an MTN SIM. Just under half owned both Airtel and MTN SIM cards. Table 7 below shows the proportion of people accessing each service provider. On asking respondents which service providers they use most, 54% indicated Airtel and 44% were mostly using MTN, leaving only 2% to the rest of the service providers (as shown Figure 6 below). This relatively close distribution of mobile phone users between Airtel and MTN underpins the need for interoperability to enable the service providers to work together.

Table 7: Proportion of people accessing mobile phone service providers

Service provider	No. of responses	Percentage of responses	Percentage of respondents with SIM cards
Airtel	1541	48.3%	77.9%
MTN	1388	43.5%	70.2%
Africell	184	5.8%	9.3%
UTL	44	1.4%	2.2%
Smart Telecom	14	0.4%	0.7%
Vodafone	10	0.3%	0.5%
K2	10	0.3%	0.5%
Smile	1	0.0%	0.1%
Safaricom	1	0.0%	0.1%
Total responses	3193	100.0%	
Accessing Airtel & MTN	962		48.6%
No. of respondents (people) with SIM cards	1978		

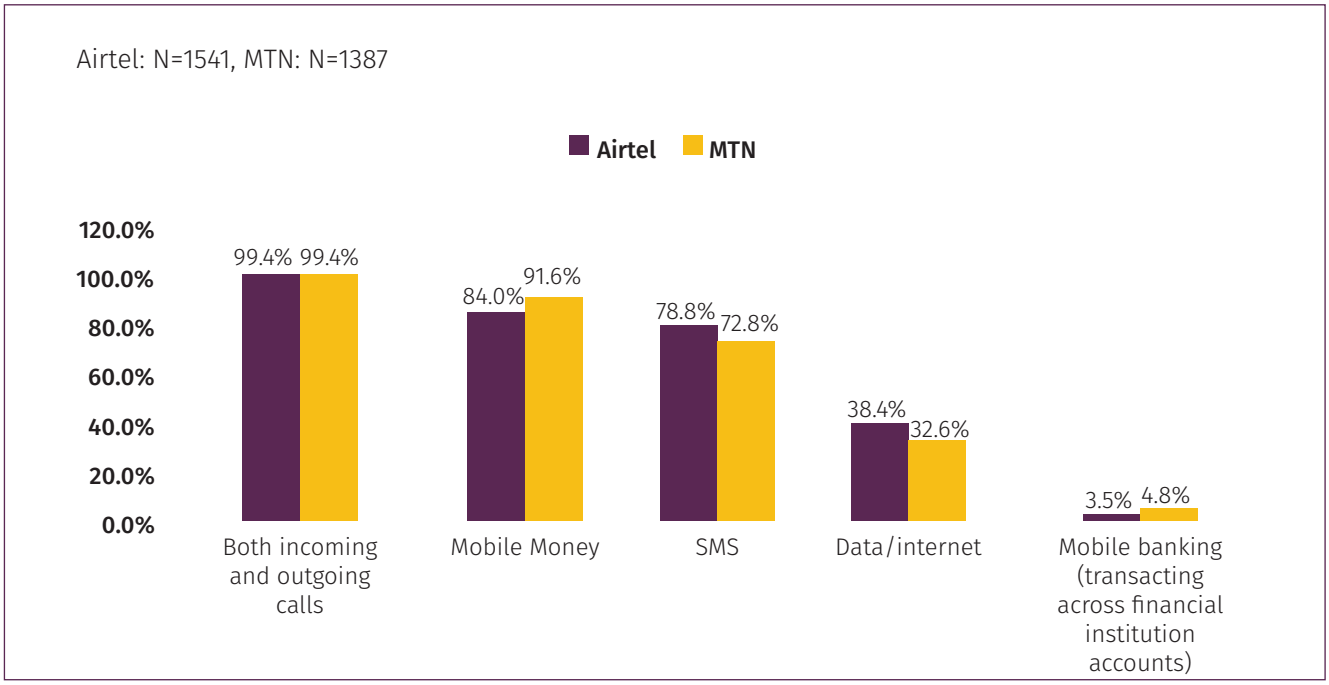
Source: *survey data*

Figure 6: Most regularly used service provider



The study confirms the extent to which people have embraced mobile money usage. This is demonstrated by the fact that it ranks second to making and receiving calls in terms of activities performed by Airtel and MTN users. It is evident, though, that the use of mobile phones to access financial institutions is still low, with Airtel registering only 3.5% of the people interviewed and MTN registering 4.8%.

Figure 7: What mobile phones are used for



Source: *survey data*

The frequency with which different mobile phone functions are performed was also analysed. The study revealed that over 99% of the respondents had made or received a call in the last week, while 42.4% and 41.2% respectively had received or sent money. When looking at the past month, these percentages increased to 85.2% and 82.1% respectively.

Awareness, access and usage of mobile money

Of the 2,000 respondents, only 5 (0.25%) had not heard of mobile money. Nearly all (98.5%) of the people interviewed had accessed mobile money services, with 94.9% having registered for such services. Just under 4% had used MM services but had not yet registered, and 1.5% had never used mobile money. Those respondents who used mobile money but were not registered for any service cited being able to use relatives' and friends' phones as the main reason for not registering. Of the 1,898 respondents who had registered for mobile money services, 69.8% had done so with Airtel and 68.8% were with MTN. Just under 39% were registered with both. The ability to send money to, or receive it from, users on other networks is a possible reason for multiple registration. It is im-

portant to note, as shown in the table below, that few people had registered for non-telecom service providers.

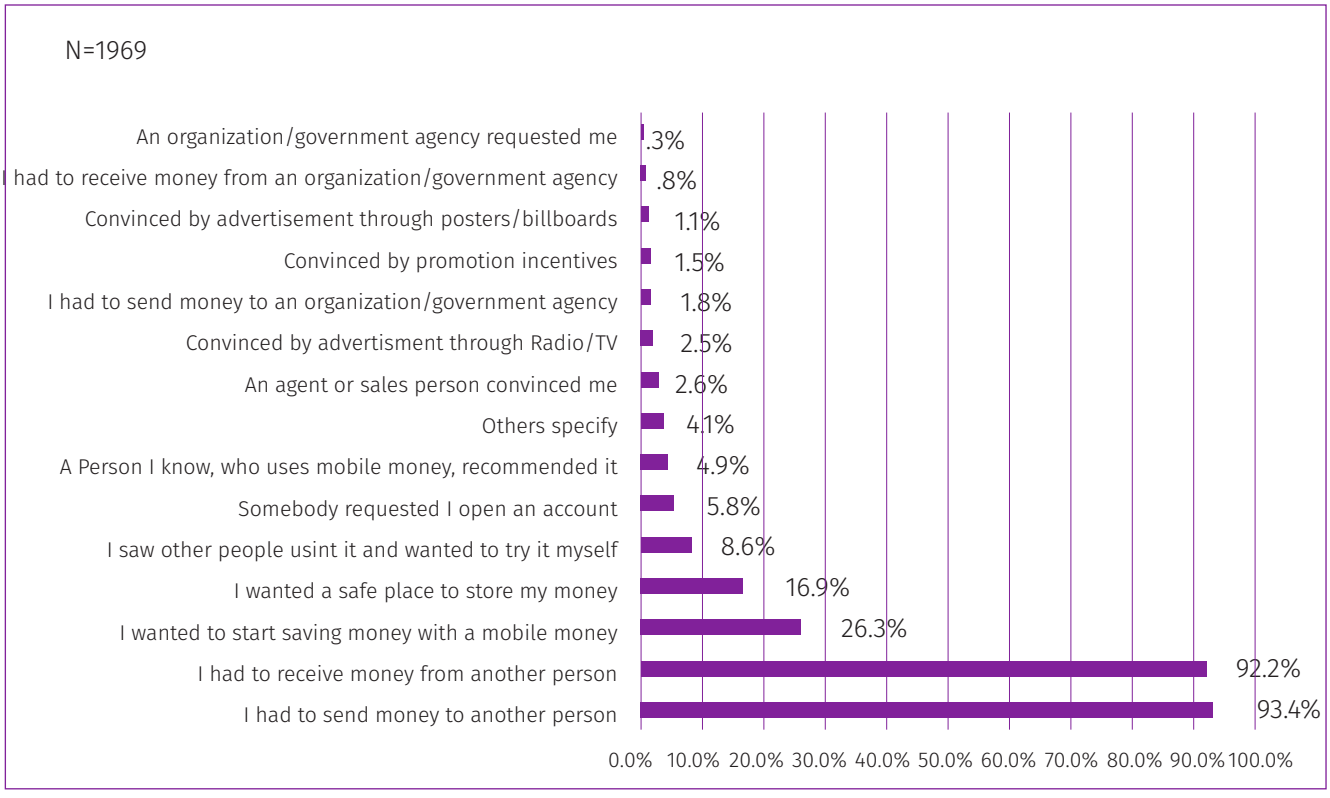
Table 8: No. of people registered for mobile money by service provider

Type	Service provider	No. of responses	Percentage of responses	Percentage of respondents
Telecom	Airtel (Airtel Money)	1325	46.9%	69.8%
	MTN (MTN Mobile Money)	1305	46.1%	68.8%
	Africell	46	1.6%	2.4%
	UTL (M-sente)	13	0.5%	0.7%
	Safaricom (M-Pesa)	3	0.1%	0.2%
	Smart Telecom (Smart Pesa)	2	0.1%	0.1%
Non-telecom	Ezee Money	60	2.1%	3.2%
	Housing Finance (MCash)	45	1.6%	2.4%
	Smart Money	29	1.0%	1.5%
	Total	2828	100.0%	
	Multiple registration	800		54.7%
	Registered with Airtel & MTN	736		38.8%
	No. of respondents	1898		

Source: *survey data*

Most respondents said they used mobile money for sending and receiving money, as shown in the figure below. Saving, and storing money in a safe place, were also major reasons for MM usage. The results below confirm that mobile money can offer an alternative delivery mechanism for providing a broad range of financial services.

Figure 8: Reason for using mobile money



Source: *survey data*

MTN (78.4% of respondents) and Airtel (74.5%) were the most used mobile money service providers. Just over half (53.4%) used both MTN and Airtel. Table 9 shows that 96.2% of respondents had used either MTN or Airtel at some point.

Table 9: Mobile money service providers used (either current or past)

Type	Service providers	No. of responses	Percentage of responses	Percentage of respondents
Telecom	MTN (MTN Mobile Money)	1529	49.3%	78.4%
	Airtel (Airtel Money)	1454	46.9%	74.5%
	Africell	51	1.6%	2.6%
	UTL (M-sente)	46	1.5%	2.4%
	Safaricom (M-Pesa)	6	0.2%	0.3%
	Others specify	2	0.1%	0.1%
Non-telecom	Ezee Money	10	0.3%	0.5%
	Housing Finance (MCash)	1	0.0%	0.1%
	Smart Money	1	0.0%	0.1%
	Total	**3100**	**100.0%**	
	More than one service provider	1067		54.7%
	Used MTN & Airtel	1042		53.4%
	No. of respondents	1951		

Source: survey data

Table 10: Functions performed by mobile money users within the past month

Activity	No. respondents	Percentage of respondents
Received money from family members, friends, workmates or other acquaintances	1618	80.9%
Sent money to family members, friends, workmates or other acquaintances	1600	80.0%
Deposited money in mobile money account/wallet	1255	62.8%
Bought airtime and data top-ups	1181	59.1%
Saved money for a future purchase or payment	622	31.1%
Account maintenance: checked account balance, changed PIN, received mini-statement, etc.	562	28.1%
Paid a utility bill (i.e. electricity, water, solar, TV/cable)	552	27.6%
Received wages	69	3.5%
Transferred money between a mobile money account and a bank account	64	3.2%
Transferred from bank account to mobile money account/wallet	60	3.0%
Taken out a loan, made payments on a loan, provided a loan or received payments on a loan	59	3.0%
Paid for other goods and services (rent, medical bills etc.)	51	2.6%
Paid for school fees	39	2.0%
Paid for large acquisitions, including land, cattle, residence	8	0.4%
Paid a government bill, including tax, fine or fee	3	0.2%
Received welfare, pension or other benefit payments from the government	3	0.2%
Made insurance-related payments or received claims on insurance	1	0.1%
Total no. of respondents	2000	

Source: survey data

The majority of respondents had received money from (80.9%) or sent money to (80%) family or friends within the past month. This demonstrates that most respondents are actively using mobile money functions. Table 10 shows that transferring money between mobile money services and banks still happens rarely, with only 3% of the respondents having done so in the past month. This highlights the challenges of interoperability within the financial sector.

Just under half (49%) of the respondents who said they transferred mobile money did so using their own wallet, while only 2% used that of a family member or friend. The remaining 49% used agents to send money, implying that interoperability is equally needed by both mobile money users and agents. It is interesting to note that most (91%) of those who had received money used their wallet to do so, while only 5% received money through agents. The remaining 4% received it through a family member or friend. People are often not eager to cash-out when they receive money, preferring to keep it in their wallet until they need cash for making payments.

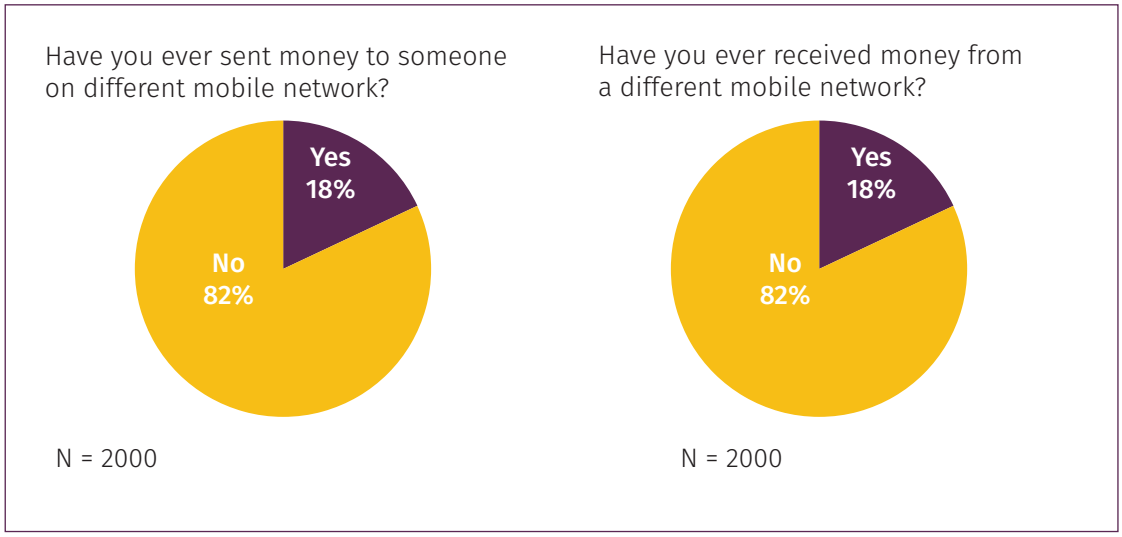
3.1.1. Peer–to-Peer transfer by end- users

For the purpose of this study we shall refer to peer–to-peer transfer as the movement of e-money from one mobile money wallet to another. The study investigated individual non-bank mobile wallets (including telecom and non-telecom), covering personal and other non-bank wallets. The research covered both current and potential mobile money users. It revealed that usage of non-telecom is negligible, as shown in Table 10 above. It also revealed that of the 2,000 respondents, none had experience of transacting across different networks with a non-telecom service provider. Therefore, this study focused on transfer between telecom mobile money networks.

Experience in performing transactions across different mobile money networks

The study revealed that the majority (57%) of respondents were aware of the possibility of sending and receiving money across different networks, but relatively few (18%) had actually performed such transactions.

Figure 9: Sending and receiving of money across different mobile networks



Source: survey data

The study investigated the last time that respondents had sent or received money across different networks. These transactions took place mainly between MTN and Airtel, with the two major mobile network operators accounting for 94.2% of the last transactions performed by the 336 people who were able to send money across different networks (these figures were 95.8% and 360 respectively when it came to the receipt of money). Table 11 shows the distribution of respondents by the service provider they used when they last sent or received money across networks.

Table 11: Distribution of respondents by service providers they used the last time they sent or received money across mobile networks

Service providers	Sent money across networks		Received money across networks	
	No. of people	Percentage	No. of people	Percentage
MTN to Airtel	193	52.7%	220	61.1%
Airtel to MTN	152	41.5%	125	34.7%
MTN to Africell	6	1.6%	2	0.6%
Airtel to UTL	5	1.4%	1	0.3%
Airtel to Africell	5	1.4%		
MTN to UTL	4	1.1%	1	0.3%
Africell to MTN	1	0.3%	3	0.8%
UTL to MTN			3	0.8%
UTL to Airtel			1	0.3%
UTL to Africell			1	0.3%
Others			3	0.8%
Total	**366**	**100.0%**	**360**	**100.0%**

Source: survey data

Of those in the table above who sent money, 56% indicated that the recipient got a message (voucher) advising them to withdraw within a specified period, while 42% transferred directly to the recipient's wallet (implying that some people had started using the technical interoperable platform implemented by MTN and Airtel). However, the fact that 96% of the respondents who sent money across networks indicated that it was more expensive to do this than to send on the same network shows there is much work to be done to achieve full interoperability. In fact, of the 154 who had sent money directly to a mobile wallet on another network, 151 confirmed that it was more expensive to do this than it would be if using the same network. The remaining three people were not aware of any cost implication. This also demonstrates the high level of awareness of the cost of sending money off-net. This may have the potential to negatively affect the uptake of financial services, which could result in reduced business to service providers and could also impede financial inclusion.

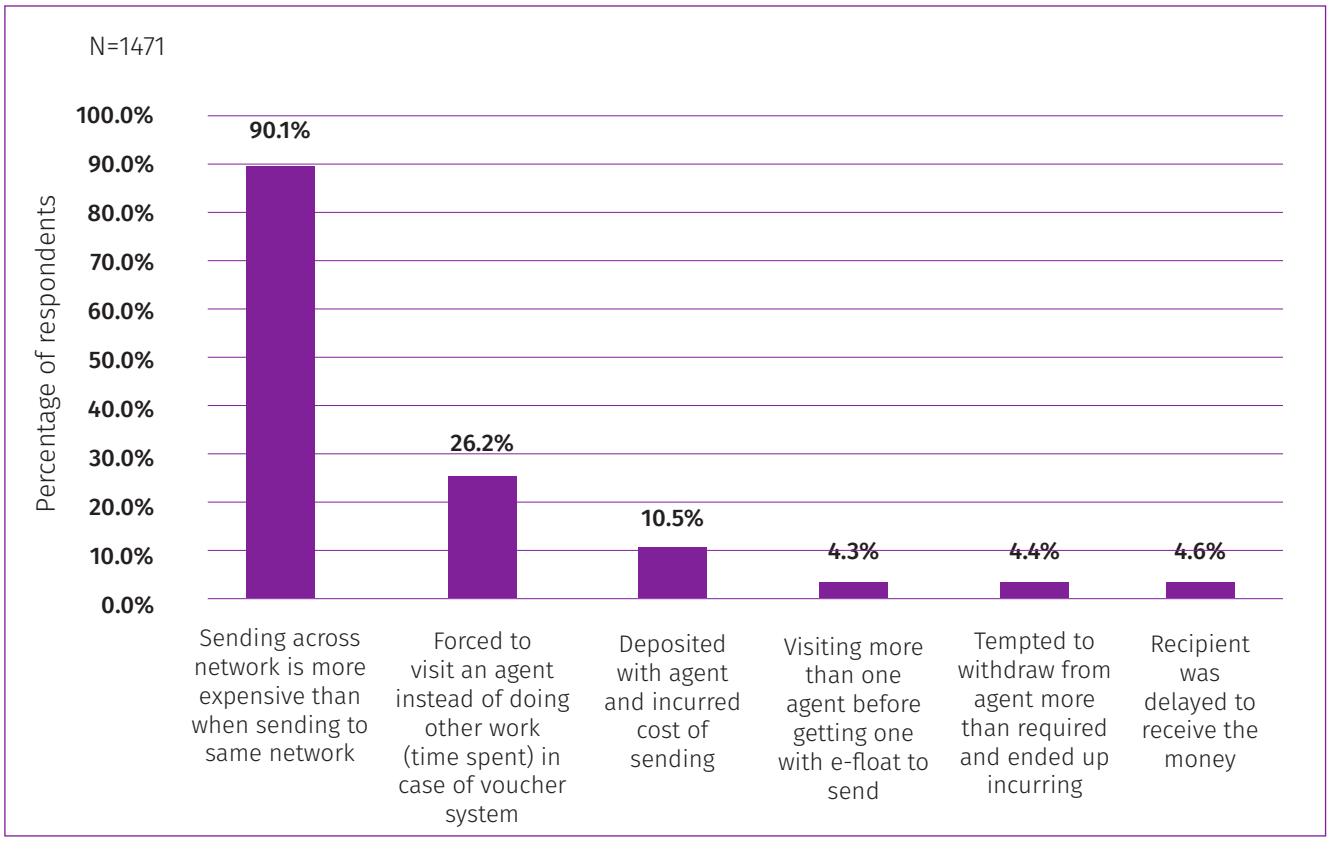
Hindrances encountered when transferring, or wanting to transfer, money across mobile networks

The study revealed that the major issue encountered when sending off-net is the fact that it is more expensive than doing so on-net. Just over 90% of respondents cited this as a problem. The next most cited issue (at 26.2%) was the time taken to visit another agent. Though it is not authorised by service providers, 10.5% of the respondents cited depositing money with an agent and incurring the cost of sending as a hindrance they have encountered (which could have been avoided if interoperability was in place). Figure 10 details the responses given for hindrances encountered when sending or wanting to send money across mobile networks.

When it comes to receiving money, the cost of the transaction was again the most cited problem (83.7% of respondents mentioned it), with being forced to visit an agent in second place once more. Figure 11 presents hindrances encountered when receiving money.

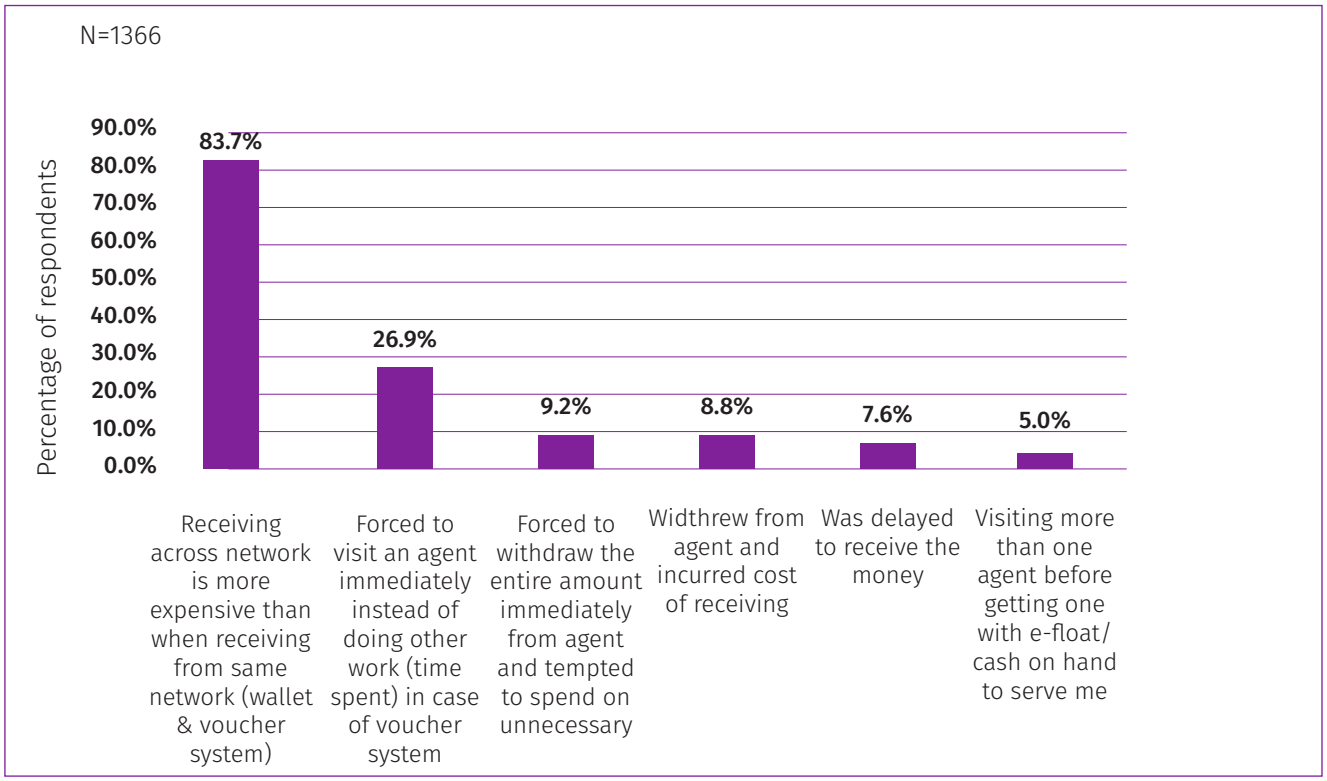
It is clear from both sets of figures that the cost of sending and receiving money across mobile networks is a major hindrance to interoperability in mobile financial services. These costs are preventing increased uptake of mobile financial services and thus are a barrier to financial deepening in Uganda.

Figure 10: Hindrances encountered when sending, or wanting to send, money across mobile networks



Source: *Survey data*

Figure 11: Hindrance encountered when receiving or wanted to receive money across mobile networks

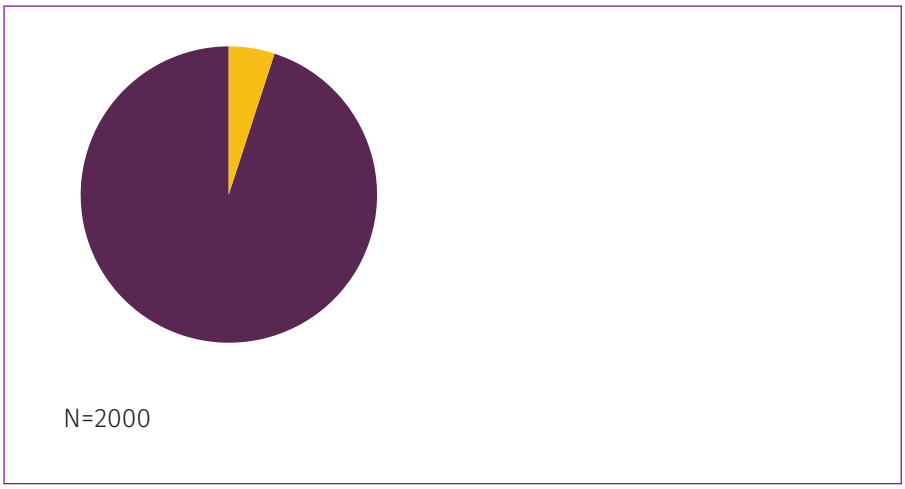


Source: *Survey data*

Demand for interoperability in mobile financial services

The results of this study show that mobile money users appreciate the importance of interoperability in mobile financial services. Figure 12 shows that nearly all of the respondents believed interoperability is necessary to make sending and receiving money across networks easier and cheaper. Figure 8 shows the proportion of respondents who feel it is necessary to make off-net transactions similar to on-net transactions in terms of ease and cost.

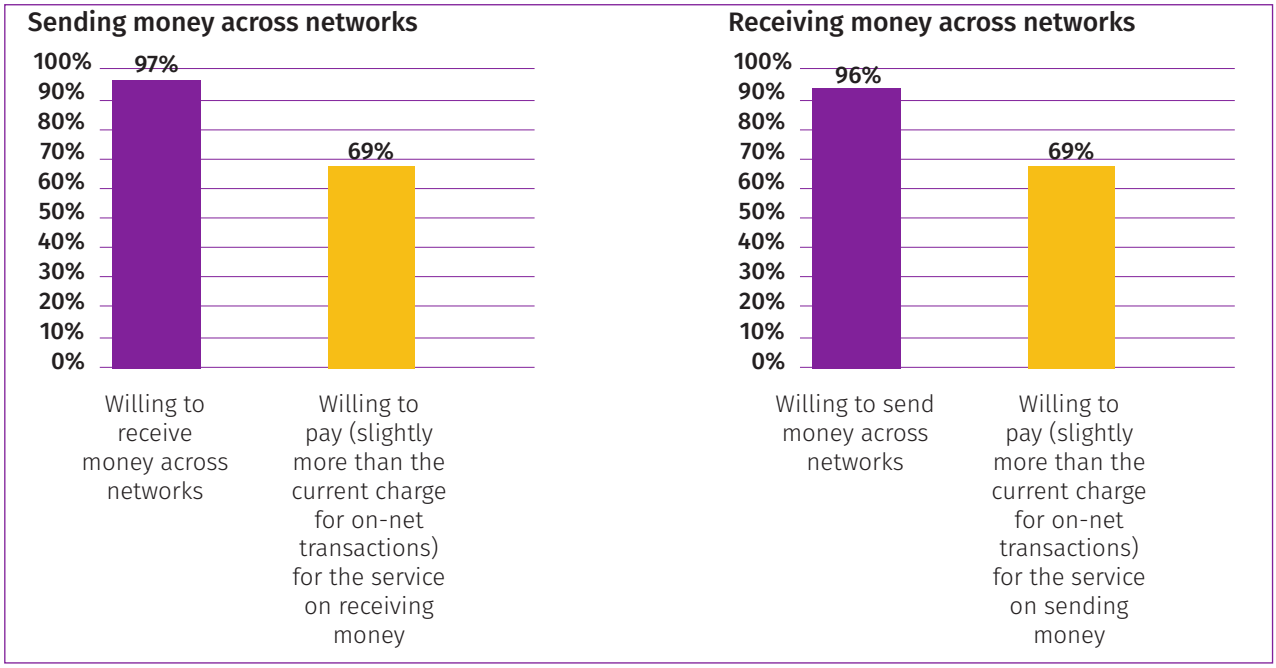
Figure 12: Proportion of respondents who feel it is necessary to make off-net transactions similar to on-net transactions in terms of ease and cost



Source*: Survey data*

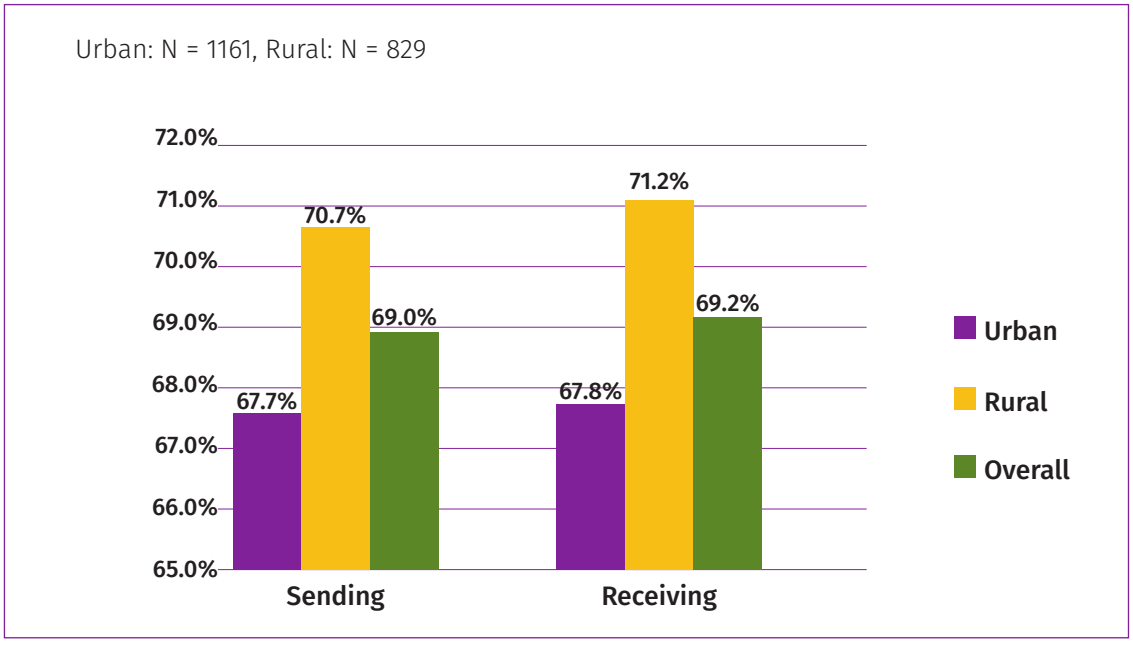
The market research findings confirm that demand for interoperability in mobile financial services is high. This is demonstrated by the willingness of users to transfer money across mobile networks and their willingness to pay for the service if fully interoperable systems are put in place. Such systems will require the establishment of working arrangements (a memorandum of understanding), agreement on a sustainable and affordable pricing system and the installation of a secure platform to process cross-network transactions. Figure 13 shows that nearly all respondents were willing to send and receive money (use the facility) 69% were willing to pay (slightly more than the current charge for on-net transaction) for the service if interoperability is fully implemented. Figure 14 shows that the proportion of the respondents willing to pay for the service is higher in rural areas (71%) than in urban areas (68%), though the difference is not significant. Currently, MTN and Airtel are working on the technical integration required to enable the transfer of e-money directly to mobile wallets, but there is still much work to be done on business-related matters to ensure that the cost of the service is affordable. The scope of this research did not cover how much users are willing to pay.

Figure 13: Proportion of respondents willing to send/receive across networks and willing to pay to do so



Source: *survey data*

Figure 14: Proportion of respondents willing to pay for off-net transactions by area type



Source: *survey data*

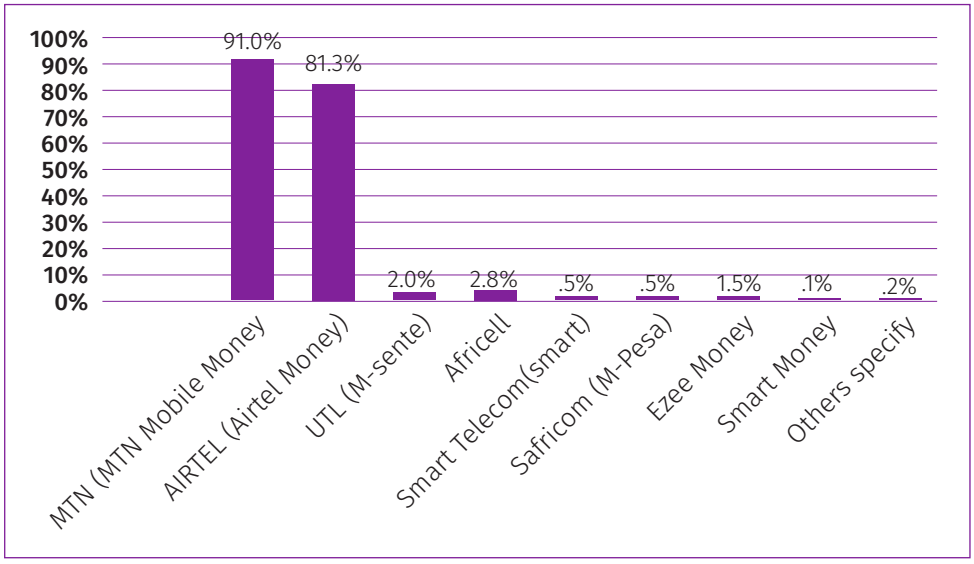
3.1.2. Cash-in deposits and cash-out withdrawals at mobile money agents

This section presents the findings of the research regarding mobile money users cashing-in deposits and cashing-out withdrawals at mobile money agents. These transactions involve converting cash into e-money and vice versa.

Experience of cash-in and cash-out at agents

Mobile money users mainly cash-in and cash-out at the nearest agent to them, with most just walking to the agent without incurring costs. Of the 2,000 respondents, 96.4% used the nearest agent. Those few who did not cited the fact that the nearest agent was registered with a different network, or that the nearest agent often did not have sufficient e-float (22.7%) and most of the times agent do not having sufficient e-float or cash on hand. This is implies that lack of interoperability is a key factor in determining which agent to use. Though many simply walk to their nearest agent, it is important to note that 15.8% of respondents said they sometimes incur costs to reach an agent. Figure 15 shows that mobile users mainly access services from MTN and Airtel agents, who accounted for 91% and 81.3% of the respondents respectively.

Figure 15: Mobile money users by service provider of the agent used for cash-in and cash-out



Source: *survey data*

The study revealed that the most common reasons for a customer failing to be served at agent are lack of sufficient e-float and lack of cash on hand. Figure 16 shows that 64% of respondents had experienced the former, and 63% the latter. Where agents face a challenge in estimating the amount of e-float to load from separate service providers, failure to be served due to insufficient e-float could be partially attributed to lack of interoperability.

Figure 16: Proportion of mobile users that failed to be served due to lack sufficient e-float or cash on hand

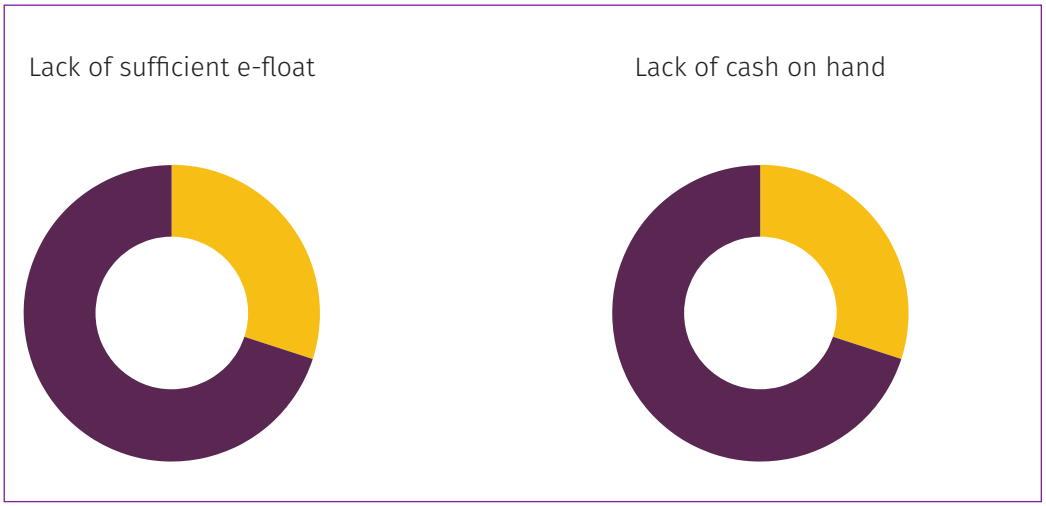
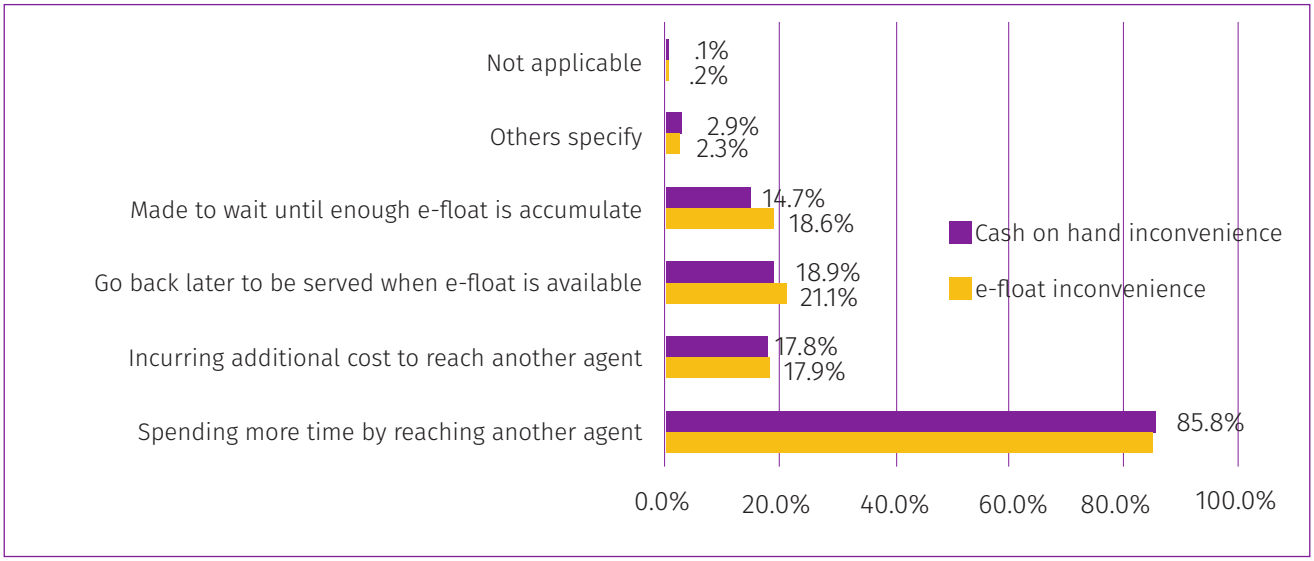


Figure 17 shows that the major inconvenience caused by failure to be served is the time spent reaching another agent. Just over 38% of respondents have also failed to be served at some point because the agent was registered with a different service provider.

Figure 17: Inconveniences experienced as a result of failure to be served due to lack of sufficient e-float or cash on hand



Source: *survey data*

Demand for interoperability by mobile money users for cashing-in and cashing-out at agents

Over 90% of mobile money users felt that it was necessary to enable people to convert e-money into cash and vice versa using any agent, irrespective of the mobile network that the agent is registered with. Nearly all users (97.6%) said they would use such a service if implemented.. The study revealed that the demand for interoperability at cash-in and cash-out points is high, as demonstrated by the willingness of 70.4% of respondents to pay slightly more than the current charge for an on-net transaction in order to carry out an off-net one.

3.2. Mobile money agents

This section presents the perceptions and practices of mobile money agents with respect to their experience of replenishing e-float and the demand for interoperability.

3.2.1. Agents' experience with replenishing e-float

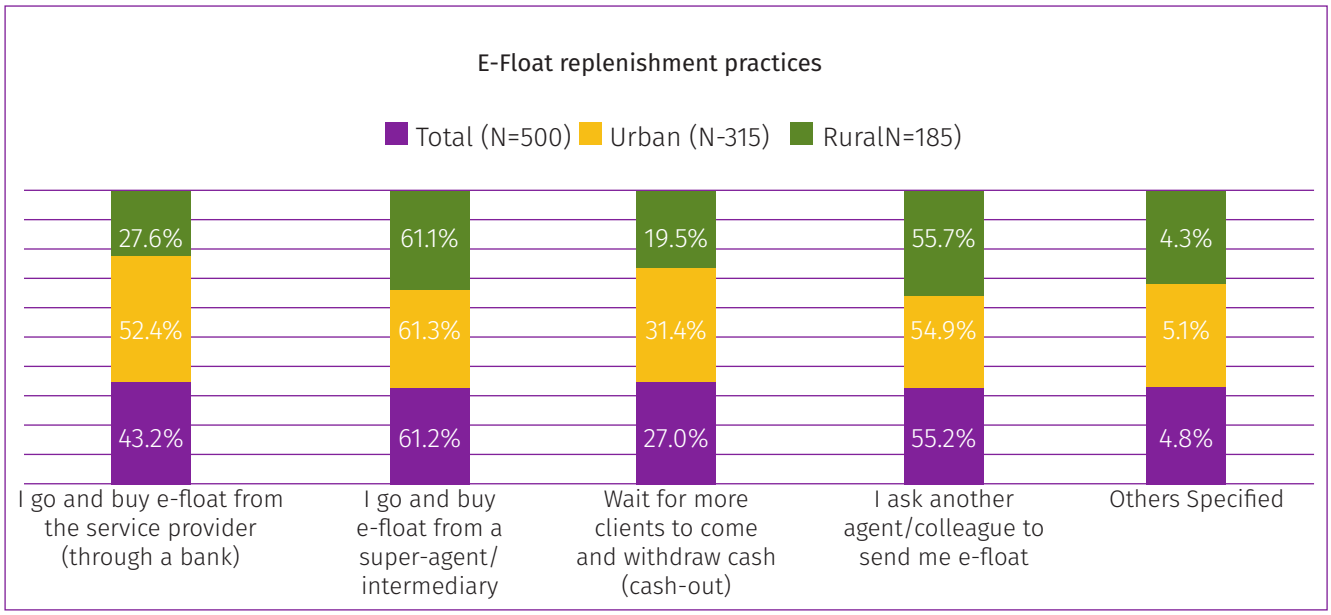
Ways of replenishing e-float

Mobile money agents are provided with guidelines on how to replenish or reload e-float. This market research sought to determine if these guidelines are followed and what practices are adopted by agents when replenishing e-float, in addition to ascertaining if interoperability can be a solution to any of the challenges faced.

One of the main regulatory concerns of Bank of Uganda is to ensure the safety of mobile money purchased at MM agents. Mobile money service providers, therefore, were asked to establish an operational relationship with a financial institution supervised by the Bank of Uganda. This partnership required the service provider to hold an escrow account with the financial institution equivalent to all mobile money that is issued to the service provider's clients and agents. This implied that agents deposit with the financial institution an amount equivalent to the e-float required.

The results from the market research indicate that the most common practice is buying e-float from the super-agent/intermediary of the service provider who is nearest to the agent, as shown in Figure 18 below. This frequency of this practice does not significantly vary between urban and rural agents. Notable, however, is the fact that urban agents are more likely to buy e-float from the bank than their rural counterparts. The significant variation in this case might be attributed to the fact that the mandated nearest financial institution is often a longer distance from the agent in a rural area than in an urban area. Another common practice is asking another agent to send e-float. This is being practiced by over half of the agents (55%) interviewed, with no significant variations across urban and rural areas

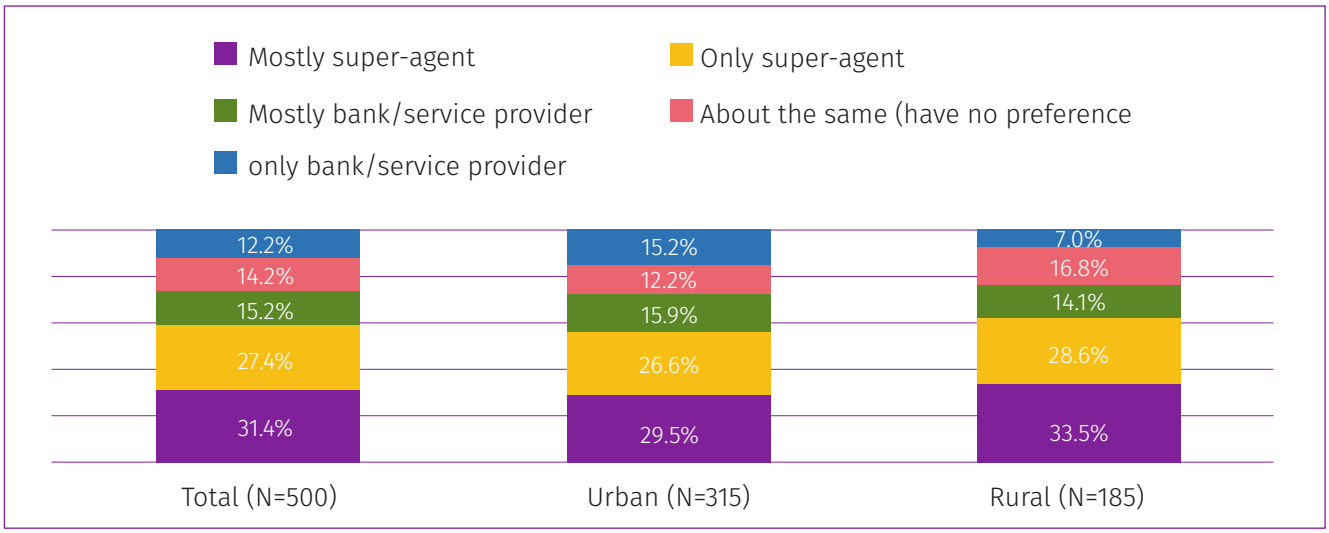
Figure 18: E-float replenishment practices



Source: *survey data*

The market research assumed the frequency of usage in a shorter period of reference is a proxy to the active usage of the service by an agent or end-user. Analysis of agents' e-float replenishment practices in the six months prior to the study shows that 31% mostly bought e-float from a super-agent, whereas 27% only purchased it from a super-agent. Usage of the bank was still minimal compared to that of super-agents, but was more common among urban agents than rural ones. See Figure 19 below for further detail.

Figure 19: E-float replenishment by agents in the last six months



Source: *survey data*

Table 12 indicates that agents who are registered with more than one mobile money service provider are more likely to use the bank to replenish e-float than those registered with only one MMSP. It is also more likely that agents registered to multiple MMSPs will use super-agents. However, in the six months prior to the research, there is a significant difference between the percentage of single and multiple registered agents who used only a super-agent –40% of the former did so, whereas only 24% of the latter did. Agents with multiple registrations therefore use a greater amount of different replenishment methods. This can lead to them incurring more costs (e.g. transportation) and also spending more time away from their point of sale.

Table 12: Replenishing e-float – multiple MMSP registration vs. single MMSP registration

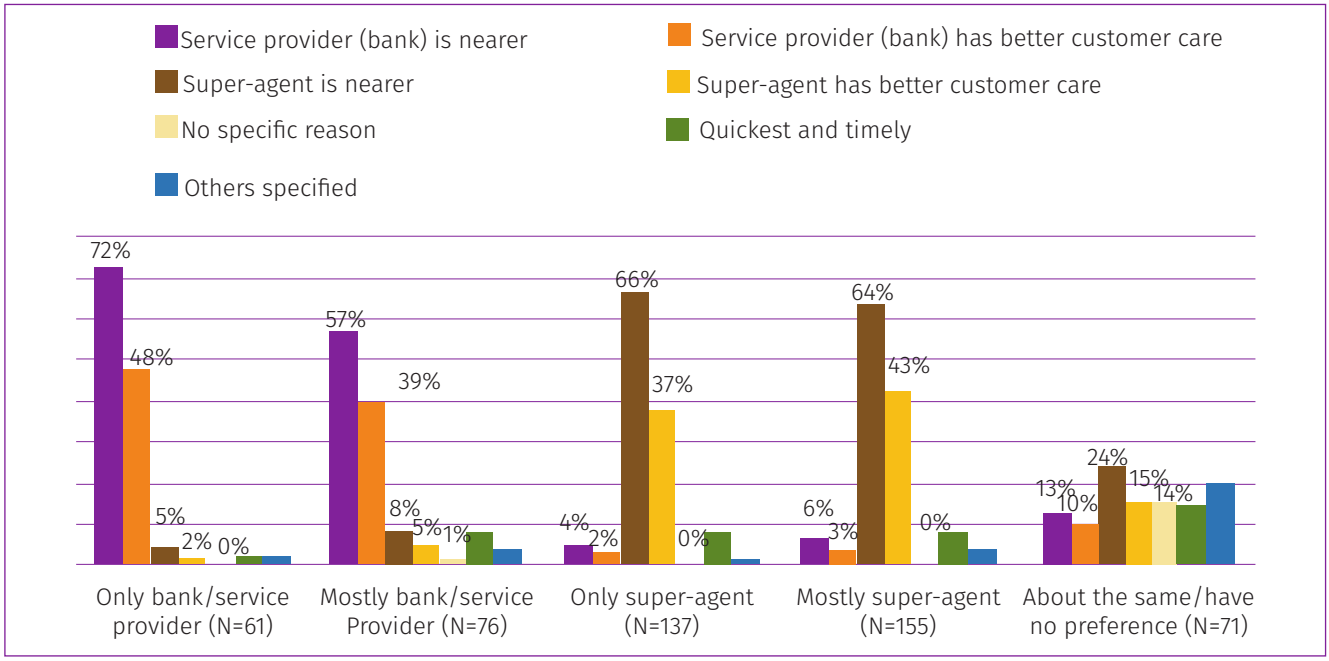
	Total	Single MMSP	Multiple MMSP
N=	500	105	395
Usual practice of replenishing e-float			
I go and buy e-float from a super-agent/intermediary	61%	51%	64%
I ask another agent/colleague to send me e-float	55%	48%	57%
I go and buy e-float from the service provider (through a bank)	43%	19%	50%
Wait for more clients to come and withdraw cash (cash-out)	27%	28%	27%
Other specified	5%	8%	4%
Replenishing e-float in last 6 months			
Mostly super-agent	31%	22%	33%
Only super-agent	27%	40%	24%
Mostly bank/service provider	15%	10%	17%
About the same (have no preference)	14%	21%	12%
Only bank/service provider	12%	8%	13%

Source: survey data

A cross-tabulation of reasons for using a given source to replenish e-float indicates that the distance from the agents' PoS and customer care are key factors. Figure 20, below, shows that 72% of those who used a bank only did so because it was nearest, while 66% of those who only used a super-agent had the same reason. Significant proportions of agents who mostly use a bank or super-agent also do so because of distance. Over 37% of those who use 'only' or 'mostly' the bank or super-agent view customer care as an important factor when replenishing their e-float.

Therefore, in relation to interoperability, it would be advantageous to the agents if the nearest bank or super-agent is able to replenish e-float regardless of which MMSP the agent is registered to. However, MMSPs should be mindful of other factors that might adversely affect support for interoperability. For example, the nearest bank or super-agent might be overwhelmed with the number of agents who need to be serviced at a particular moment, which might lead to delays or poor service delivery.

Figure 20: Reasons for using a given source to replenish e-float



Source: *survey data*

Super-agents are often located nearer to agents than banks are. As detailed in Table 13 below, two-thirds of agents are within a 10-minutes journey of their nearest super-agent, compared to 54% for the nearest bank. Therefore, the travel time taken to replenish e-float is a major determinant in deciding which source will be used, and thus further evidence in favour of interoperability.

Table 13: Time taken to reach the nearest super-agent or bank

Duration	Time taken to reach nearest super-agent			Time taken to reach nearest bank		
	Total	Urban	Rural	Total	Urban	Rural
N=	500	315	185	500	315	185
Less 5 minutes	40.4%	45.7%	31.4%	28.2%	30.5%	24.3%
6 to 10 minutes	25.2%	24.4%	26.5%	25.4%	25.7%	24.9%
11 to 20 minutes	15.6%	14.3%	17.8%	17.2%	18.7%	14.6%
21 to 30 minutes	10.6%	7.9%	15.1%	17.2%	13.0%	24.3%
Over 30 minutes	8.2%	7.6%	9.2%	12.0%	12.1%	11.9%

Source: survey data

Costs incurred

Agents incur costs when replenishing e-float. Transport, mentioned by 44% of the agents interviewed, was the main expenditure cited, and is more likely to be incurred by those who only use the bank to replenish. Such agents also incur bank charges. Agents registered with multiple MMSPs incur greater travel costs given that they must travel to more outlets. Interoperability could help to minimise these costs.

Table 14: Costs incurred when replenishing e-float

Type of cost	Total	Source of replenishing e-float in last 6 months				
		Only bank/ service provider	Mostly bank/service provider	Only super-agent	Mostly super-agent	About the same (have no preference)
N	500	61	76	137	155	71
Transport costs	44%	64%	49%	40%	40%	37%
Bank charges	35%	69%	63%	10%	31%	32%
Charges by super-agent	10%	7%	8%	17%	8%	6%
Other specified	10%	7%	1%	15%	9%	13%
None/Not applicable	29%	10%	16%	34%	32%	44%

Source: survey Data

Effects of running out of e-float

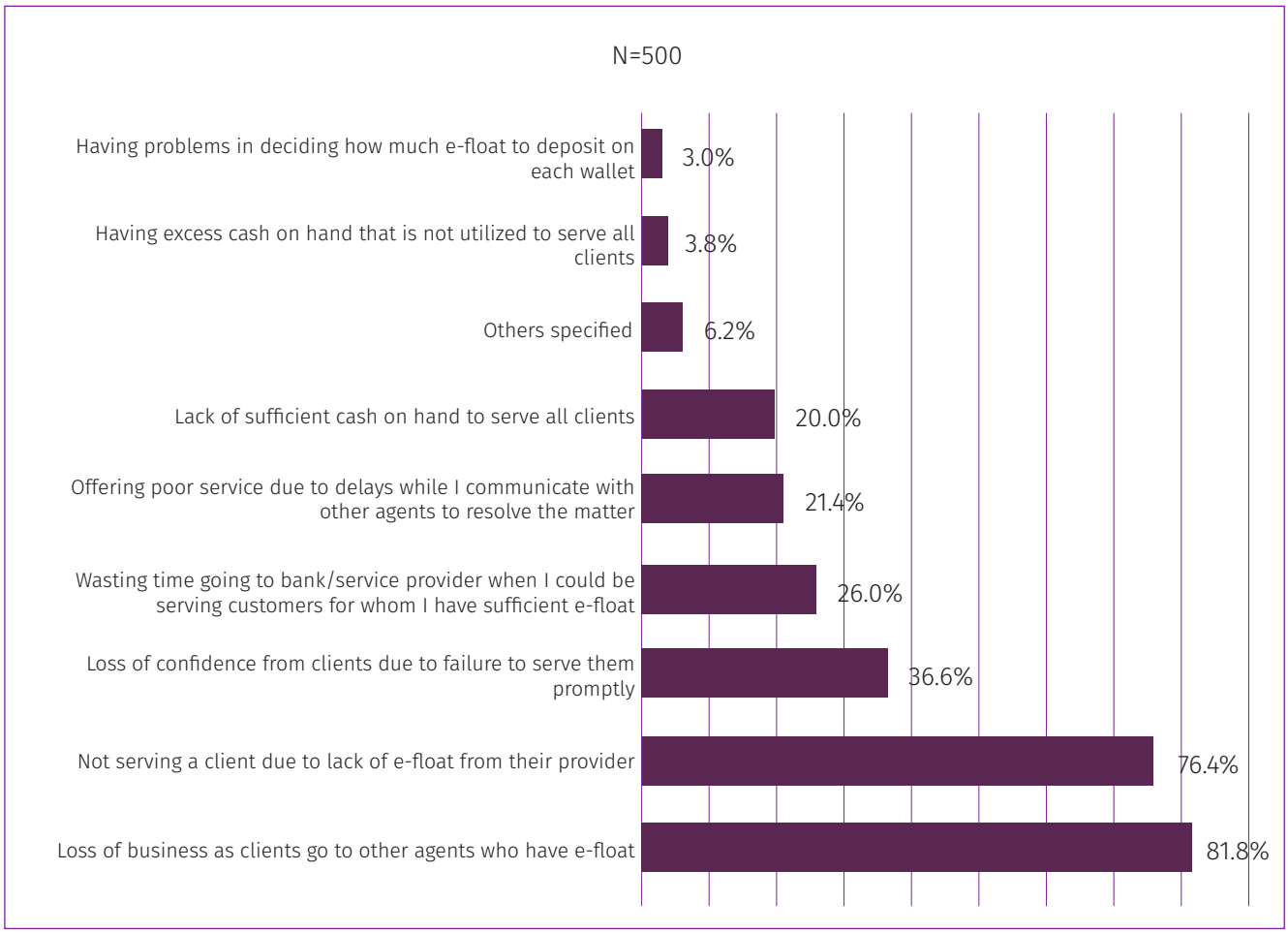
This study sought to identify the challenges faced by agents when replenishing e-float, with the aim of ascertaining if interoperability can be a feasible solution.

From Figure 21, it is evident that the main concern for agents who have run out of e-float loss of business. Just under 82% reported this as a concern. Interestingly, just above a quarter (26%) of agents said that travelling to a bank or super-agent to replenish e-float for one particular account was not beneficial for their business, as it wasted time that could be spent serving other clients for whom e-float was available.

Having excess cash on hand for e-float accounts serving small number of clients and deciding how much e-float should be deposited on each wallet were not seen as major challenges by the agents.

Agents registered with multiple service providers are the most likely to benefit from interoperability, as it will enable them to use any of the e-float accounts available to them that have sufficient money to serve all customers. An agent with a single registration would definitely have to turn away customers if they run out of e-float. In addition, those with multiple registrations will further benefit if interoperability enables them to replenish one account with e-float from another. This would mean the agent would not need to travel to the bank or super-agent to replenish.

Figure 21: Effects of running out of e-float



Source*: survey data*

3.2.2. Demand for interoperability

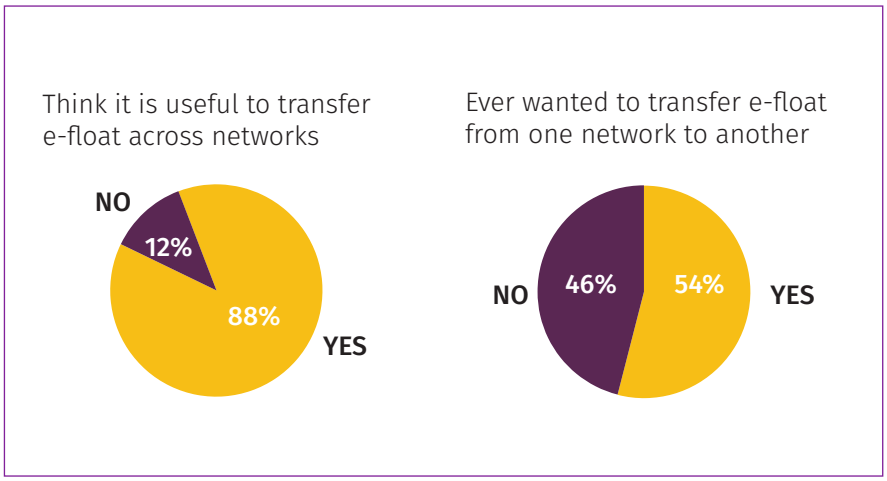
For this market research, the demand for interoperability among agents was measured by the extent to which they felt cross-network e-float transfers were necessary, and the extent to which they wanted to be able to use a single e-float to serve all customers. In addition, we also measured their willingness to incur an extra charge on commission if interoperability is operationalised.

Transfer of e-float to facilitate CICO across networks

The need to be able to transfer e-float across networks is significant, as shown in Figure 22. Although just over half (54%) of the agents interviewed said they had at some point wanted to transfer e-float across networks, the majority (88%) think it is useful to be able to do so. On considering multiple registrants only, these figures are 57% and 89% respectively. Therefore, the results do not show any significant difference between multiple registrants and overall respondents. Perhaps most significantly, as shown in Figure 23, 93% of agents said they would transfer e-float across networks if enabled to do so.

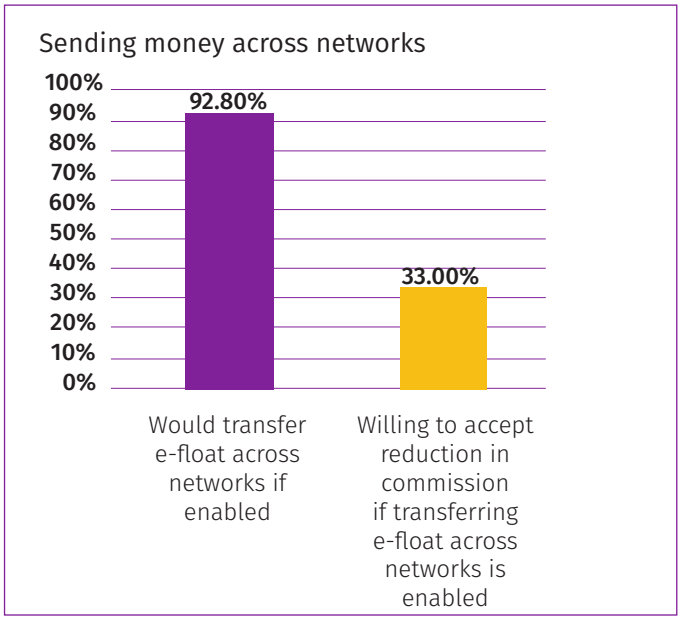
Only a third of agents, however, said they would reduce their commission in order to enable cross-network transfers. This lack of willingness presents a significant limitation to the implementation of interoperability. Interoperability would reduce agents' costs in other ways (by removing transport costs and bank charges incurred, for example), but despite this it is still likely to be a challenge to get support from the biggest players in the mobile money market.

Figure 22: Proportion of respondents who have wanted to transfer e-float across networks and those who think the service is useful



Source: survey data

Figure 23: Proportion of agent respondents willing to transfer e-float across networks and those willing to accept reduction in commission to do so



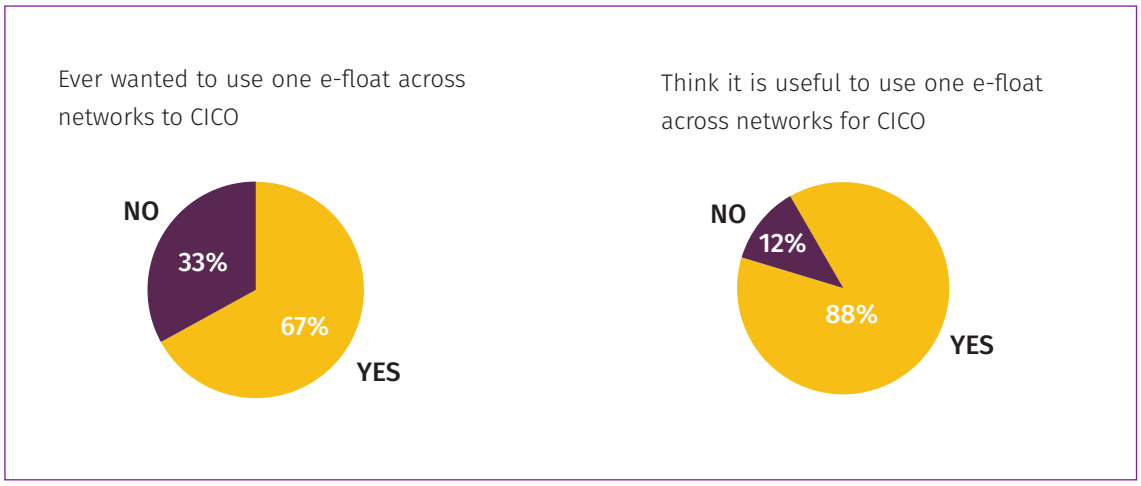
Source: *survey data*

Using one e-float for CICO across networks

The thoughts of agents on cross-network CICO, shown in Figures 24 and 25, are similar to those regarding the transfer of e-float. Around two-thirds of the agents interviewed have wanted to cash-in or cash-out across networks, and 88% think that such transactions are useful. Over 90% of agents are willing to use one e-float for CICO transactions, but 67% said they would not be willing to reduce their commission to do so.

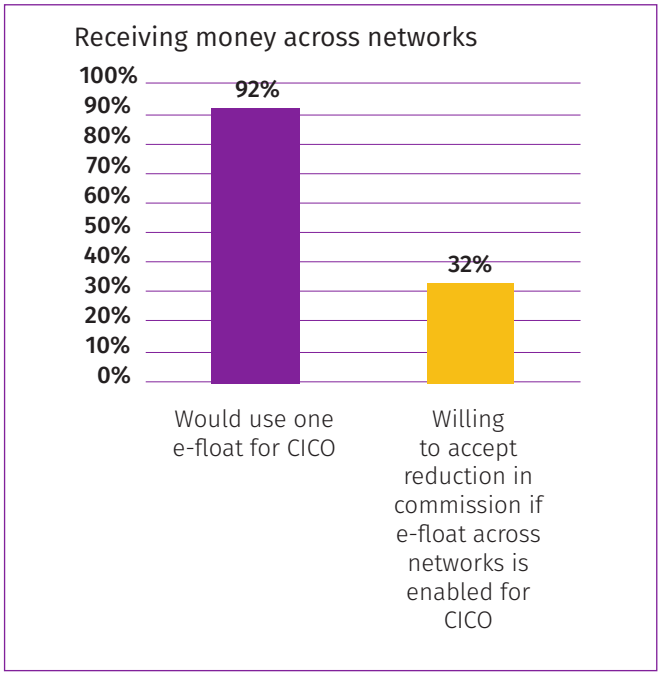
Although agents are ready to seize the profit-making opportunities offered by transferring e-float across networks or by using a single e-float, they are hesitant about the costs involved. In that sense, they differ from end-users, who do not appear to mind paying a higher cost for cross-network transactions. Interoperability is also likely to increase competition (BFA, 2014) among agents and/or service providers. A reduction in commission, therefore, may be particularly harmful if the benefits of interoperability do not outweigh it.

Figure 24: Proportion of respondents who have wanted to use one e-float across networks for CICO and those who think the service is useful



Source: Survey data

Figure 25: Proportion of respondents who would use one e-float across networks for CICO and those willing to accept reduction in commission to do so



Source*: Survey data*

With the increase in the number and value of mobile money transactions, and the reduced over the counter activity observed over the past four years (Ssettimba 2016), agents have become the backbone of mobile money services. They represent more than 90.5% of the cash-in and cash out footprint in countries with such services. Agents' commission is a significant cost of operations (GSMA 2015), but it is this commission that has encouraged the growth of MM agents across Uganda. Therefore, any reduction in the commission for agents is likely to negatively affect the growth of mobile money services.

The demand for interoperability among agents is driven an expectation that it will increase customer numbers, and also by the fact that it may minimise certain costs that agents incur. However, these benefits are more likely to be enjoyed by agents registered with multiple service providers.

4. CONCLUSIONS

Based on the findings of the research, we can conclude as follows:

a Most of the respondents use MTN and Airtel as their mobile money service providers. These operators serve around 8 in every 10 end-users, who are more or less equally distributed between the two. This emphasises the need for interoperability in mobile financial services in order to allow users to transfer money across networks.

b The higher cost of off-net transactions being more expensive is the major hindrance caused by lack of interoperability in transferring money. This problem is preventing increased uptake of mobile financial services and thwarting financial deepening in the country, since most users are aware that it costs more to send off-net. When it comes converting e-money to cash and vice versa at an agent, the majority of mobile money end-users have at some time failed to be served either due to lack of sufficient e-float or cash on hand. The major inconvenience caused by this is the time spent reaching another agent.

c Demand for interoperability by mobile money users is high, both for transferring money across networks and for cash-in and cash-out at agents. This is demonstrated by the willingness of mobile money users to perform transactions across networks, and their readiness to pay for the service if fully interoperable systems are put in place. Such systems require the establishment of working arrangements (a memorandum of understanding), agreement on a sustainable and affordable pricing system, and the installation of a secure platform to process cross-network transactions.

d The majority of agents decide where to replenish e-float based on the distance from their PoS to the source of the e-float purchase. The major cost to agents in replenishing e-float is that of transport. The majority believe that it is useful to implement interoperability, either through enabling the transfer of e-float across networks or by enabling the use of a single e-float for all networks. Most agents would be willing to use these facilities if implemented, but a reluctance to pay for the service means demand is lacking.

e Interoperability should be implemented using a phased approach. This should start with the two major service providers, who have already begun working on the technical infrastructure. Such an approach would minimise the length of negotiations, which would be much longer if all service providers were brought on board simultaneously. An enabling environment should, though, be created, to allow other mobile money service providers to eventually join the arrangement.

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