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Microfinance and mobile banking for the bottom of the pyramid

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Abstract

Purpose – The purpose of the paper is to illuminate the necessary features of a microfinance mobile banking platform through the use of agents.

Design/methodology/approach – This is a conceptual paper, not an empirical one.

Findings – The authors illuminate the importance of specifiying what successful partnership between the mobile network operator and the microfinance organization must include and they highlight what a mobile application should include.

Social implications – There are roughly two billion unbanked mobile phone users who could be served by a partnership between mobile technology and microfinance. This type of partnership begins to address financial exclusivity among the poor.

Originality/value – The paper offers an original, detailed solution about how agents and technology can be used to help the poor access mobile banking platforms.

Keywords Microfinance, Banking, Mobile banking, Bottom of the pyramid, Partnership

Paper type Conceptual paper

Introduction

The world's poor need access to secure sites for savings, credit, financial transfers, and exchanges. Yet, only one billion of the world's 6.5 billion people have access to bank accounts (Consultative Group to Assist the Poor, 2007). Microfinance institutions have begun to assist the poor by providing business loans. Banking services can be extended to the poor using mobile telephone technology.

The financially excluded[1] and mobile networks

Many financially excluded are not excluded from mobile networks. Approximately two billion people in emerging markets do not have bank accounts but do have mobile phones (Consultative Group to Assist the Poor, 2007). The reach of mobile phone networks offers opportunities to financially stabilize a large population in the developing world (Boston Consulting Group, 2011; Grameen Foundation, 2011). For example, while South Africa has a mobile penetration rate of 77.06 per cent, only 46 per cent of the population is banked. Mexico has a 54.71 per cent mobile penetration rate, with only 25 per cent of the population participating in banking services. Pakistan has a 32.64 per cent mobile penetration rate, with only 12 per cent of its population banked (GSM Association, 2007).

Among bottom of the pyramid (BOP)[2] mobile owners, phones are used primarily for phone calls, SMS (text) messaging, and balance checking. Unlike other financial transactions, balance checking is a static function; money does not move into, out of, or between accounts. Balance checking, while useful and essential for account monitoring,

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is insufficient for complete financial freedom and flexibility. Financial independence requires a secure way to make and receive transfers, and to deposit or withdraw money.

Those who already use financial services through their mobile devices also need to improve their financial literacy. In many countries there is a greater tendency to withdraw cash than to deposit cash, defeating the objective of saving (Murray, 2010). Improved financial literacy and education can be coupled with access to mobile financial services (MFSs).

Socio-economic impact of mobile money

Besides individual access to financial services, mobile money generates a variety of social benefits for consumer communities: an increase in domestic capital formation, incorporation of credit into the banking system, savings in time and cost that MFSs provide. Access to credit facilitates entrepreneurship, new business creation, and employment (Bhavnani *et al.*, 2008). Remittances and domestic payments infuse money into the economy, and the increased savings within the banking system enable credit to expand. Overall, MFSs can reduce financial exclusion by 5-20 per cent through 2020 and increase GDP by up to 5 per cent (Pakistan, for instance, would experience a 3 per cent increase (Boston Consulting Group, 2011). This increase in additional jobs and businesses generates additional tax revenues for governments.

Besides collective social benefits, MFSs reduce the impact on families of financial shocks caused by floods, earthquakes, and drought. In Pakistan, for example, EasyPaisa launched a relief payment distribution system, which solicited and distributed donations during floods. A similar concept was implemented in Haiti to provide earthquake relief. Kenya's M-PESA UAP Insurance insures poor farmers against weather-induced crop failures.

Inefficiencies of mobile technology and microfinance

Although mobile banking has demonstrated a potential to deliver financial services to a wider base at a cheaper cost, customers may be difficult to reach. The cost of mobile services remains one of the biggest barriers for penetration of low-income sectors. Low income individuals devote a considerable amount of their earnings to telecommunications services. Average telecommunications customers spend 2-3 per cent of their income on these services, while low-income individuals in developing countries spend as much as 10-40 per cent of their income on mobile services (de Angoitia and Ramirez, 2009). Moreover, the size of the initial investment – the mobile handset – is a barrier for non-users.

While low-income clients use of mobile banking has been promising, far more effort has been spent on registering new clients than on teaching them how to use the technology. For example, while 90 per cent of the world's population had mobile phone coverage in 2010 (with most of the growth in the developing world), less than 10 per cent of MFSs users are low-income (Telecommunications Development Bureau, 2009). Many of the 10 per cent of MFS users who are low-income earners, use mobile finance for one or two months, but then significantly reduce or stop using the service (Gardeva and Rhyne, 2011).

Low usage of MFSs is due to the client's inexperience with and lack of trust in these technologies. Low-income consumers fear mistakes could be made while conducting a transaction with a machine; they are confused about where to turn when something goes wrong, and they are concerned that using bank cards will lead to

over-indebtedness. Another constraint is the cost of the service. At first glance, the cost of banking transaction may seem affordable, but when users transfer money to those outside of their mobile network (or to an unregistered user), costs escalate.

Despite mobile phones' potential to reach many more customers, no m-banking service exists in the vast majority of countries. This gap represents a business opportunity for mobile companies, microfinance institutions, and traditional banks to combine their consumer bases and their business expertise (Kumar *et al.*, 2010).

Scarcity of reliable data about the financial health and transaction history of the rural poor is a challenge for microfinance organizations. This information can reveal the credit worthiness of customers, their ability to spend and to save within their means (Ghosal, 2010). More advanced technologies log and track individual financial history of clients, offering microfinance institutions a more organized and precise mechanism for charting, comparing, analyzing, and monitoring their clientele. Microfinance banks have already implemented technologies to develop alternative distribution channels. These include biometric automated teller machines (ATMs), mobile vans, and kiosks in marketplaces equipped with point-of-sale devices (Kumar *et al.*, 2010). While these methods represent a comprehensive distribution strategy, in the long run a more mechanized, singular approach would be more organized and cost-efficient for microfinance institutions.

Collaborations between MFI's and mobile service providers

From the mobile companies' perspective, there is a business opportunity in the underserved low-income markets. For example, mobile banking introduced 90 per cent of Kenyans who did not have bank accounts into the formal financial world of money transfers (Wambalaba *et al.*, 2009). Banks like equity and cooperative began to seek partnerships with mobile companies to introduce this new device to their customers. Simultaneously, technologies offered by microfinance institutions tapped into lower income markets.

Using m-banking reduces costs both for MFIs and for customers. Studies have shown that mobile banking can lower the cost for banks of delivering financial services by over 50 per cent by reducing back office operating costs and upgrading old technology (Consultative Group to Assist the Poor, 2008). In turn, mobile banking can help to reduce the high interest rates that microfinance institutions must charge to cover the cost of administering small loans. Direct and frequent contact with customers in inaccessible locations is expensive, but mobile telephony reduces this cost. Mobile banking saves customers the cost of waiting in line at banks, the opportunity cost of taking time away from work and the cost of transportation (Murray, 2010).

As more MFIs experiment with m-banking, a larger low-income customer base collectively may be reached. In the meantime, MFIs should consider m-banking as a way to serve their existing customers better. Although MFIs may independently develop their own product or devices, collaboration with mobile phone companies will be more cost efficient for MFIs. The MFIs will be able to exploit the expertise of mobile phone operators saving them time and money (Kumar *et al.*, 2010). Currently, critical obstacles for MFIs are high operational costs associated with staff and the inefficiencies of managing cash and information (Grameen Foundation, 2011).

Types of collaborations

For small organizations planning to offer mobile phone banking solution partnerships with mobile network operators (MNOs), banks, and/or third party service providers

are essential. Because MNOs focus on volume first, smaller banks and MFIs will need to form large, collective units to attract the attention of MNOs. In countries without m-banking systems, MFIs can decide whether to develop their own services or wait till infrastructures are created. They can use mobile phones for non-cash purposes (i.e. sending SMS messages for repayment reminders, checking balances). In countries with m-banking systems, MFIs can use these networks for loan disbursements, repayments, and deposits. As a way to learn about m-banking services and to ease the burden of creating their own networks, MFIs can act as agents for banks. Such relationships help MFIs earn extra revenues through commissions (Kumar *et al.*, 2010).

Requirements for a successful collaboration

After institutional structure is determined, financial literacy should be considered. Three categories improve financial literacy: promotional information to increase sales and profits, product orientation to manage the financial instruments offered by a specific institution, and financial education to encourage effective money management (Cohen *et al.*, 2008). Good financial education addresses information asymmetries by providing advice on earning, spending, saving, and borrowing and encouraging the exploration of financial options.

Currently, banks employ a combination of marketing and promotional material with product orientation, but this information is limited in scope and depth. For example, Equity Bank customers in Kenya reported that the only information they received about the bank's new mobile banking service was primarily promotional and was conveyed via text message sent to individual phones (Cohen *et al.*, 2008). Equity launched a multifaceted marketing campaign in supermarkets throughout Kenya incorporating video advertisements in supermarkets to promote their debit cards and cash back services. In areas surrounding their branches in the Dominican Republic, ADOPEM uses television and radio broadcasts to promote their electronic cards. Other banks rely on brochures and print media, with nearly all the institutions offering written instructions in either English or the local language. This promotion strategy falls short of reaching low-income communities in many countries, where a large percentage of microfinance clients are functionally illiterate.

In Kenya, those responsible for marketing and product orientation are account officers, bank staff, or sales agents. The orientation activities are generally one-time offerings at the time of registration, with little follow-up between the financial service provider and the client (Cohen *et al.*, 2008).

Some promotion and orientation techniques do not rely on agents or staff at all; they merely offer brochures. After product orientation, providers assume that clients have acquired sufficient knowledge to navigate the technological financial services. For the BOP clients, this is often not the case. The most common questions posed to help desks involve basic concepts and mechanics of device usage, indicating that product orientation fails to educate clients adequately. These questions include, for example, "How do I use an ATM?", "How do I transfer funds?", "How do I check my balance?", and "How can I withdraw or deposit cash through an ATM?" (Hopkins, 2007).

As suggested by these questions, one main misconception that service providers have is that product orientation on the mechanics of using the technology is needed only once. For example, M-PESA customers who infrequently use the m-banking service noted that between transactions made, they forgot the steps for operating their accounts. Furthermore, relying on assistance from help desks is often difficult or impossible.

Congested phone lines or communication barriers, may make help desks impossible to reach. Moreover, bank staff typically are not responsible for answering questions on troubleshooting or the mechanics of technology.

Trust and privacy are important issues in financial education for mobile banking (Aggarwal *et al.*, 2010). Clients are asked to trust technologies that may be new to them in order to conduct financial transactions of potentially scarce and hard-earned capital. For some at the BOP, the technologies themselves may be unfamiliar. For others, the technologies may be familiar, but the application of these technologies for managing their money is unfamiliar. To promote trust in these technologies, financial education must emphasize that mobile banking can be cheaper, safer, and more convenient than traditional banking. The importance of privacy must also be sufficiently explained, specifically the purpose and usage of PINs.

A challenge for financial education is the dispersed and remote nature of the client population, thus a comprehensive delivery strategy for financial education is most effective. The research indicates that some delivery channels are more effective than others (Lee, 2002). In Kenya, for example, the radio is the preferred delivery channel for financial education, especially when broadcast in local languages. By contrast, clients in the Dominican Republic express a preference for classroom training. The younger generation and more affluent populations are turning more increasingly to the internet and text messages for instruction (Hopkins, 2007). Newspapers may be better suited for the urban and higher income populations, while radio may be more appropriate for the rural populations. Ultimately, the selection of delivery channels depends on context – multiple options may be combined for optimal scope (Cohen *et al.*, 2008).

Other preconditions for adoption

Besides financial education, there are three other prerequisites for a successful mobile money system. The first is regulation, which includes setting up and enforcing MFS policies that incorporate the structure of the MFS framework for non-banks, guidelines for the use of MFS agents, and government initiatives (Boston Consulting Group, 2011). Regulation must be three-tiered. The first should address agent controls and money laundering, countering terrorism financing, and customer background checks and tracking. The second should regulate consumer privacy protection and payment systems. The third should enforce the underlying framework, such as data privacy, e-commerce and e-security, general banking, taxation, and general telecommunications (Dias and McKee, 2010).

Second, a cooperative business model must be in place. Since both banks and telecommunications companies can offer MFSs, there must be transparency between these players. The MFS business model must include a framework for profit sharing and pricing mechanisms.

Third, a reliable distribution network must be represented by MFS agents who are trained and certified, and must guarantee the security and availability of cash (Boston Consulting Group, 2011).

Arguably there is one more prerequisite for successful adoption: microfinance insurance, or "microinsurance" (Churchill, 2006). Microinsurance protects low-income individuals against specific dangers or disasters in exchange for regular premium payments that are proportionate to the likelihood and the cost of the risk in question (Lloyd 360° Risk Insight and Microinsurance Centre, 2009). Without microinsurance,

low income persons use detrimental risk management strategies that include raiding savings or reducing important expenditures, taking credit from family or money-lenders, liquidating assets, or in the extreme case, selling children into bonded labor. These strategies bring severe secondary costs to the households (i.e. high interest rates, loss of a source of income).

The role of government

Governments can promote financial markets by supervising and regulating financial institutions, deregulating interest rates, reducing excessively high reserve requirements, and relaxing credit controls. Additionally, governments can adjust the regulatory framework to facilitate financial service operations in rural areas by community-based, deposit-taking intermediaries (i.e. microfinance institutions).

Since the institutional foundations for financial markets in rural areas are frequently absent, lenders need a formal system for claims against property and enforcement of financial contracts. While government supervision is valuable for financial markets, it is widely acknowledged that governments should primarily facilitate the workings of the market so that private players can allocate resources efficiently in accordance with price and profit cues. An important role for the government is to limit excessive risk-taking by financial intermediaries and to provide a regulatory framework for enforcing contracts (Yaron *et al.*, 1998). Must and Ludewig (2010) go farther by recommending that governments subsidize the development of local mobile money infrastructure and adopt policies that help form a decentralized network of mobile money agents.

Regulation directed at financial service providers and client protection can create greater legitimacy and an orderly market environment. Better regulation improves transparency, which invites competition. Competition will lower prices for consumers, improve operating efficiency, reach new populations, and introduce new products. Furthermore, regulation can facilitate the spread of new technologies (Gardeva and Rhyne, 2011).

As new technologies and payment innovations do advance, regulatory frameworks need to adapt quickly to ensure their fair operation. For example, in December of 2008, Kenya's finance minister ordered an audit of Safaricom's mobile money transfer service M-PESA. While the audit concluded that the service was safe and reliable, it underscored the need for continued supervision by the treasury and central bank. The challenge for governments will be to incorporate protections for account holders and market competition into their legislative regimes without hampering the development of innovative methods for delivering financial services (Murray, 2010).

A role for training

An increasing business problem for MFIs is the inadequacy of current staff training. As MFIs in rural areas grow, the staff in these areas need practical, timely, and accessible training. One potential solution is distance learning, an alternative to face-to-face training. Virtual training allows for inexpensive, continued follow-up. The lower cost of training also reduces the dependency on donors to subsidize training. In addition to reducing costs, distance learning reduces the time-lag between training and implementation (i.e. the time of transportation between training site and rural site). Finally, distance learning encourages leadership and personal accountability for independent learning by staff members (Agabin *et al.*, 2006).

An essential component of any training is cultural sensitivity and specificity. A training curriculum that recognizes the specific cultural context of the clientele will be more successful in creating and retaining a trusting and loyal client base for the firm. Hofsted (1980, 1983, 1998) and Bankole *et al.* (2011) hold that nations have distinct cultures that affect how individuals in their culture behave. Hofsted, in particular, suggests that national cultures have five dimensions. The first, power distance, is the degree of inequality among people that the population of a culture considers appropriate. For example, cultures with high power distance stress the power difference between bosses and workers and emphasize hierarchies, while those cultures with low power distance minimize these differences, the second, uncertainty avoidance, is the degree to which people in a culture feel comfortable with uncertainty and ambiguity. Cultures with high uncertainty avoidance will shun risk taking and may find dealing with a banking system too much of a gamble. The third dimension, individualism, is the degree to which people prefer to act autonomously rather than collectively as members of a group. One might expect a culture that values individuality would appreciate the opportunity to have an individual bank account, where the money that one earns is considered one's individual property. For microfinance organizations that deal in cultures that prize collective decision-making, however, the group may have a positive impact on enforcing repayment of loans. The fourth dimension, masculinity is the degree to which individuals value assertiveness and competition (masculine values) over more feminine values of service and personal relationships. High masculine cultures emphasize the differences between gender roles, men having stereotypically masculine roles and women, feminine ones. In high masculinity cultures women may not be treated as equals and hence they may not be allowed to take on roles the culture considers masculine. This may pose a problem for women who want to manage their own money and have their own bank accounts. In this case, some education would have to be directed at men to show them the benefits of having their wives manage money. The fifth dimension, a long-term orientation, is the degree to which a culture values long term commitments and tradition over a short-term focus. In a culture that has a short-term focus it may be difficult to impress upon people the benefit of saving money.

Proposed solution: technology with a human touch

The best way to respond to these requirements for successful adoption is to create a mobile phone application that could be delivered by an MFI agent. Using a specific pin number, agents' clients would access their accounts through the application on the agent's phone. The use of a human interface would help to eliminate some of the current barriers to usage. For example, a human agent could facilitate an increase in trust in new technologies for populations that are reluctant to adopt them. A human agent would eliminate the concern regarding access to help in the event of a potential technical mistake. Human agents eliminate the clients' need for transportation to and from banking facilities. Most importantly, they eliminate the need for mobile phones – a valuable incentive for those at the very BOP.

In addition to reducing costs for the client, an agent network facilitates financial education. Education can be formalized through a curriculum available to all agents through the mobile application. This curriculum could be divided into sections, and imparted in sequence over the course of several visits. Education would not only strengthen

clients' trust in the technology and agent, but also reduce the literacy gap between men and women by making women less dependent on their husbands' financial knowledge.

Besides managing client data and an educational curriculum, the mobile application can assist the agents. The mobile device would notify and remind them of their weekly visits to rural areas. In serving essentially as the briefcase of the agent, the application would contain everything necessary to facilitate banking services for the client. In sending these agents straight to the customers, MNOs, banks, and MFIs would directly expand their reach. The client's account would be held with the collaborating bank of the MNO or with the MNO if it offers its own banking services.

The application, developed and managed by the MNOs, would organize and assign a network of agents provided by the MFIs. MFIs offer the advantage of generally being closer to rural people, with a better idea of the demographic composition of local villages. Furthermore, in having a better idea of the cartography of certain regions, they can provide the research needed to divide each region up into manageable units for each agent. The benefits for the MFIs include the generation of additional revenues through commissions earned by the agents. Additionally, in collaborating with MNOs, they can become familiar with the technologies available for banking services, which they can choose to incorporate eventually into the development of their own product (Table I).

Obstacles/critical risks

The proposed mobile application should be a transitional device until mobile phones become widespread among the poor. Until the market drives down the price of smart phones, the application leverages mobile banking technology without the need for a phone.

MNOs will need to ensure the privacy and security of personal PINs, to be kept secret even from agents. Aggarwal *et al.* (2010) suggest that security concerns can be better managed with scannable smart cards containing biometric information such as fingerprints.

Because agents must accept physical cash in order to subsequently credit the client's account, there is the security risk of losing track of that money or of having it stolen. MNOs need to carefully vet their agents to ensure that they are hiring individuals without criminal records. To track transactions, SMS notifications should be sent to agents when their clients' cash has successfully been deposited and clients should be taught to verify that their cash was successfully added to their accounts.

In order for an agent network to work, agents must be able to make a reasonable living. In Uganda, the Grameen Foundation's Applab partnership with Uganda's largest mobile operator ran into problems because agents were not securing enough customers. If agents have to service their current customers this may interfere with their signing up new ones, which will keep them from earning sufficient commissions.

Finally, more research should be conducted on the types of phones that can perform these particular functions, and on the necessity of standardizing the cell phone used by the agent network. If all smart phones have the capacity to perform these technological functions, agents or MNOs will have more flexibility to use their discretion in choosing phones.

Conclusion: cultural impact of microfinance and mobile money

In order for mobile banking to successfully reach the poor, these authors hold that a critical mass of subscribers is essential and that both MFI and mobile banking operators

Features	Purpose
Roster of agents and their regional assignments	To organize the network of agents and their assignments To provide contact information for inter-agent communication
Mobile notifications and reminders of village visits	To help keep up with deadlines by making regular contact with clients To create accountability by clarifying assignments and a medium to keep track of those assignments
SMS notifications of client account balance, upcoming payment deadlines, and when cash deposits have been successfully received by the bank	To prioritize clients of high risk To determine if additional attention/visits are necessary To track cash to ensure low risk of losing clients' money through agent transfer
Banking platform facilitating client PIN-enabled log-in	To offer mechanized financial services to previously inaccessible or reluctant clients
Database of client information/history	To enable agents to contact clients To access clients' financial history to better serve them
Agent training curriculum (includes cultural sensitivity curriculum)	To standardize training across all agents To promote a common understanding of cultural sensitivity To accommodate the schedules and mobility of agents through distance-learning
Financial literacy curriculum	To promote financial literacy and education of clients To close the literacy gap between men and women, making women more financially independent To encourage more educational dialogue between clients and agents To create trust between the client and agent, and between the client and the technology To educate clients of the lag-time between giving money to an agent and processing that cash at the bank (when the money added is reflected in the account balance)

Table I.
Proposed mobile application

should better understand their respective operations. MFIs have traditionally been concerned with loans and savings while mobile banking have been concerned with payments and transfers. MNOs need to develop products specifically to meet the needs of the poor (Grameen Foundation, 2011). A critical mass of customers is needed to provide incentives for agents, MFIs, and mobile operators. The high operational costs associated with staff and managing information must be spread among a large customer base in order for mobile operators to be able to make such an investment. Governments may be involved to help subsidize the effort, and provide regulation and oversight. Training in the technology and financial literacy must be provided for customers.

Despite these risks, microfinance and mobile technology can play a substantial role in the economies of developing countries. According to the International Labor Organization, employment creation and poverty reduction are inherently linked. Microfinance is a recommended solution for alleviation of poverty, making a powerful

contribution to the job market by providing opportunities for small investments in self-employment or job creation. Micro-credit, micro-savings, and microinsurance help people manage their earnings. Microfinance also promotes the empowerment of women, by improving women's position within the traditional household and community through financial self-reliance and security. Microfinance and mobile money reduce vulnerability by providing a safety net for the working poor, whether they work for wages or are self-employed.

We are beginning to see the many ways in which mobile phone technology reduces poverty. The Grameen Foundation has extended mobile phone use to tackle more than financial services. Its mobile livelihood program connects people with potential jobs through text messages and its health outreach programs provide services to pregnant women and HIV patients. Its agricultural programs use mobile phone to provide up to date information to farmers about how to manage their crops. More applications using mobile technology should continue to help the poor.

Notes

1. Financial exclusion is the lack of access to financial products and services in the mainstream market that are needed to lead a normal social life (European Commission, 2008). Rates are higher for the poor, women, the transient, young adults, and the elderly (Financial Inclusion Taskforce, 2009; Peachey and Roe, 2004).
2. BOP is the term used to describe the largest, but poorest socio-economic group, living on less than $2.50 per day.

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