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Mobile Identity and Financial Inclusion at the Bottom of the Pyramid

Movirtu is a for-profit, mobile-network software social enterprise backed by venture capital. Movirtu provides mobile-identity management software to leading mobile telecommunications operators. The company's core geographical focus is Africa and South Asia. It works with mobile operators and non-governmental organizations to serve people who live on incomes of $1-$2/day and can't afford to purchase or maintain a mobile phone, do not have regular access to electricity, and appreciate the convenience of being able to log in to any handset. Mobile identity services are particularly useful for rural poor women.[1]

Much of Movirtu's customer base lives on $1-2/day. They cannot afford to purchase or maintain a mobile phone but still need access to phone services. This group, which makes up 30-50 percent of our target markets in Africa and South Asia, currently relies on public or shared phones and pay a premium to use a phone, either as a service fee to a public operator or as a sweetener to an acquaintance to offset concerns about compromised confidentiality or credit use. Mobile users who use a shared or public phone have no "identity," so while they are able to make brief calls or send a text message, no one can reach them individually. They cannot enjoy the full benefits of mobile communication, such as banking or personalized content services, which require a user identity.

Movirtu's Cloud Phone allows users to log in and out of any GSM phone connected to its operator client(s) who have installed Movirtu's Cloud Phone technology. The Cloud Phone service creates a new customer for the mobile operator and gives the user a mobile identity. This is defined as the unique and secure connection between a mobile user and his or her data, including his or her mobile number and call records, and his or her mobile money account and information services, such as health notifications or agricultural information.

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Mobile identity historically was tied to the SIM card in a mobile device. The SIM card or mobile device holds critical user information: the mobile number, call history, user information and messages, as well as applications. Where electricity is scarce and phones went uncharged, services were not accessible.[2] Phones represent a significant out-of-pocket expense to buy and to maintain and charge. Therefore, despite significant growth rates in mobile penetration, the majority of poor rural users, especially women and youth, remain excluded from the benefits of mobile because they lack a mobile identity.

Mobile identity can confer enormous benefits to end users by extending mobile services to those who do not own handsets. One application of mobile identity is mobile payments. Research from the Consultative Group on Access to the Poor (CGAP) estimates that 2.7 billion working-age adults do not have a formal-sector savings, transaction, or credit account, and even fewer have formal insurance.[3] They often pay a premium for keeping deposits with third parties or to send money. These methods may be common, but they are neither secure nor confidential.

Given the fast growth of mobile communications and relative ease of access, mobile is positioned as the most likely way to deliver financial inclusion at scale, particularly in poor rural markets in Africa and South Asia. As the focus for financial inclusion shifts from early efforts in microcredit and enterprise toward longer-term practices of saving and investing, mobile phones and networks play a key role. Branchless banking makes sense where transaction costs are high and capital is scarce. CGAP estimates that it is 38 percent cheaper than branch banking in serving the bottom of the pyramid (BoP), and mobile phones are the most cost-effective way to deliver branchless banking.

USER VIEWS, BARRIERS, AND DRIVERS

Movirtu conducted quantitative research and in-depth group discussions with farmers, entrepreneurs, and young people living on $1-$2/day about mobile services and user needs, and has discovered a series of barriers for the poor, as well as insights that will help spur the adoption of new services.[4]

Barrier Number 1: Lack of mobile identity frustrates demand and limits skill acquisition

Movirtu's quantitative research findings show that a rural woman in Tanzania has to walk 52 minutes to access the most commonly used phone, both because of the sparse population and because borrowing a phone is a major favor. When researchers asked users what their experience of borrowing a mobile phone is like, many stories were of pent-up demand. The borrowers were anxious about asking a favor of the lender and felt obliged to pay more than the amount of phone credit they used, resulting in a borrower's premium of up to 50 percent. The borrowers often had little privacy because the owner of the phone would be anxious about how much credit was being used and the privacy of data on the phone. This con-

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strained the likelihood that the borrower would do anything but make the most basic quick calls or text messages. Because borrowers did not have the leisure to experiment or explore the phone's capability, they had little faith in their ability to use advanced services, whether mobile money or the Internet.

In Tanzania, women and farmers told researchers that mobile money currently was not "suitable" for them, due to a lack of knowledge, fear of theft, and fear of deleting data.[5]

Barrier Number 2: Mobile competes with existing social groups, which have other benefits beyond the financial

In the book *Portfolios of the Poor,* Daryl Collins investigated the financial activities of people living on $1-$2/day in Bangladesh.[6] Although none of her research participants had access to formal financial tools such as a bank account or credit card, they were actually very active financially. They juggled debt, savings, insurance, and other financial instruments in a complex network every day in order to meet ordinary and extraordinary costs on fluctuating incomes.

While many of Movirtu's BoP users do not have bank accounts or even mobile phones, they all belong to social groups for informal financial services and support. These groups are called many different things in different countries, but behave similarly. In Tanzania and Senegal, "merry go rounds" are key financial institutions used to fund emergency situations or big events, with repayment and contribution based on solidarity. Merry go rounds are also called "games," indicating that there is an enjoyable component of chance to them where users might get a nice surprise.

These social activities reinforce the sense of community solidarity, control, and existing social ties. In Senegal, women farmers describe group meetings as an important social occasion for women to drink tea, exchange information, and pay in their group contributions. If several women found they had a similar issue, they might team up to seek help from experts or outsiders, a more socially acceptable solution than going alone to strangers.

The young people interviewed by Movirtu's researchers were aware of and open to mobile money and discussed its advantages, such as avoiding queues and travel time and easier record-keeping, although they still described mobile banking as expensive. Mobile money may not yet have the trust or familiarity that existing groups convey, despite certain functional advantages. The real competitor to mobile money is the wide variety of groups, which are trusted, familiar, and enjoyable.

Barrier Number 3: The affordability and suitability of owning a mobile device, especially for women

Very few women in the Movirtu BoP research groups owned phones. This gender gap in phone ownership has been quantified by the GSMA in its foundational MWomen study, which indicates that men in Africa and South Asia are up to three

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times more likely to own a phone, creating a gender gap of 300 million women worldwide. Put another way, the research found that three-quarters of women with household incomes below US$75/month do not own a phone.[7]

Women are less likely than men to want to own a phone, for a range of reasons. They have other priorities for the money, like children's education, concerns about husbands' or friends' jealousy, and a sense of caution about generating large phone bills without being able to pay for them. In some areas of the world, such as Orissa, India, religious or state authorities have decreed that girls should not own phones before marriage.[8]

Non-affluent women usually have to borrow someone else's phone. Although a few women mentioned using a relative's mobile bank account, it was an exception rather than routine behavior. Therefore, if the gateway to mobile banking is owning a mobile, these women will continue to be left out. Movirtu's research shows that other barriers to purchasing a mobile phone include concerns about affordability, for the purchase and maintenance of a handset as well as charges for minutes.

Across India, Tanzania, and Senegal, Movirtu's users expressed that they were consistently becoming worse off from an economic point of view, due to declining income and escalating costs of inputs and staples. Virtually all respondents spoke at length about how higher costs have hurt them, without bringing any more money to farmers or small traders directly: the surplus income was siphoned off by brokers or middlemen with better access to markets and information. Mobile phone expenses were viewed with some concern—although the mobile was considered beneficial, spending was thought to be unpredictable. Fear of theft, particularly of a more expensive phone, was particularly common among women.

While the cost of handsets is falling and headlines tout the benefit of "cheap" smart phones, the poor believe a cheap handset is cheap for a reason—most likely that it is unreliable or likely to fail. Also, even a "cheap" handset is still $20 for a basic handset or $75 for a smartphone at best: when the poor are spending 80 percent of their income per day on food, this does not leave much room for saving for high-ticket items.

As the cost of the most basic needs, including food, continue to increase or be volatile, rural residents are challenged by both increases and uncertainty about their incomes from agriculture or small-scale trading, thereby putting disposable income at risk and encouraging potential buyers to make purchases conservatively.

Barrier Number 4: Skills and confidence of "advanced" phone use

The level of skill and confidence relating to technology is extremely varied among those at the bottom of the pyramid. Adults over 30, women in particular, report having little skill in the use of mobile devices, and of technology more generally.

During the in-depth qualitative work conducted in August 2011 in Tanzania, India, and Senegal, Movirtu's researchers heard from users that they use basic

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phones for basic purposes, that is, calling and the occasional SMS. Only our youth respondents displayed any knowledge of or enthusiasm for advanced services such as the Internet.

Researchers were told that smart phones and the Internet were for "others"—that is, the young and the educated. Because technology use today is often mediated by enthusiastic young family members, youth can and should play a role in building both the skills and confidence of their parents, especially their mothers. Moreover, mobile service providers need to work with users where they are today, and capability and skill-building must be part of expanding the number of mobile users.

As a female Indian entrepreneur told Movirtu researchers, "I feel, let the children go with the technology development, so they can come up." Another added, "We are very backward. Let our kids understand and come forward, we will happily welcome this."[9]

To sum up, while mobile payment or banking solutions have a great deal to offer the poor, there are hurdles to be overcome for mass adoption: the affordability of handsets, the importance of mobile identity, and the cultural and gender barriers to "advanced" use of a mobile phone.

THE VIEW FROM THE TELECOMMUNICATIONS NETWORK OPERATOR: PROS AND CONS OF VARIOUS TECHNICAL SOLUTIONS

The overall business-to-business challenges to setting up a mobile banking infrastructure are significant. These include the right way(s) to brand and market financial services, the right means of structuring teams or sales channels, how to build successful bank-mobile partnerships, and questions relating to agent networks and liquidity. These are all valid concerns that must be faced if mobile banking is to mature as an industry. The telecommunications industry also faces certain dilemmas in the provision of mobile banking services, including technology issues, and all possible decisions have pros and cons. One fundamental choice is whether to offer SIM-card-based applications or network-based solutions.

SIM-card-based solutions are generally linked to a phone, so they are personal from the start. Operators typically have chosen to provide applications on the SIM card. SIM toolkit applications integrate closely with phone features and appear to the user to be part of the phone's functionality.

SIM-card-based solutions have been very successful in expanding the utility of a mobile phone and allowing mobile network operators to deliver significant value to users. As services expand to new markets, upgrade cycles speed up as applications continue to improve, distribution and maintenance become more complex and expensive to manage, raising a question about the viability of universal financial inclusion from the operator's point of view.

An example of distribution complexity involves the more expensive, higher memory capacity SIM cards often used for financial services. Because most rural users have very basic phones that after contain antiquated SIM cards, the most

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foolproof way of distributing new services is via a new SIM card. This places the burden on the user to replace the SIM card in the handset, and on the operator to pay for logistics and carriage costs. Movirtu has found that distribution costs of up to US $7 per SIM card are not unusual.

Because mobile is a highly dynamic and rapidly evolving market, operators and partners need to react to changing demand and emerging segments in a cost-effective way. An example of this is the need to upgrade applications frequently and continue to increase their utility. Assuming the SIM card in the user's phone is capable, operators can and prefer to use "over the air" update processes, because they control them. Over the air platforms are an inefficient and network-intensive way of making frequent changes and are not wholly reliable: time critical updates are not well suited to this method.

There are user issues for SIM cards as well. While SIM cards are easily portable, unless they are in a phone, it is difficult for users to keep them safe. During a study conducted recently in East Africa, Movirtu researchers asked SIM-card-only users about their experience with SIM-card ownership. Seventy percent of the respondents from a base of more than 300 users said their SIM card had been lost, damaged, or stolen in the course of a calendar year. Many of those most in need of financial services are itinerant or casual laborers who work in dusty or wet conditions, or farmers. SIM cards have been dropped into a ditch, eaten by a farm animal, and stepped on by an unwitting child. SIM cards are often lost, damaged, or stolen, and are therefore a poor investment for both operator and customer alike. In an environment where the SIM card is holding significant value, such as the insurance on a smallholder farm, there are many risks in trusting the application to a thumbnail-size piece of cardboard and metal. Also, the replacement cycle for lost SIM cards can be as long as 8-12 weeks, due to infrastructure, distribution, and inconsistent supply.

BEYOND THE SIM CARD: THE NETWORK AS DISTRIBUTOR

Moving beyond the SIM card, which requires physical distribution, networks themselves can be used as a distribution channel to all who are connected to it, making it possible for far greater increments of inclusion to happen very quickly. In the United States and Western Europe, the "app" revolution, combined with smart phones and the availability of tablets, is transforming both consumption and the creation of content, resulting in a proliferation of useful and enjoyable services. The ubiquity and affordability of the Internet in developed markets makes it possible to put the burden of discovery and managemenft squarely on the end user.

In Africa there is very low Internet penetration. Moreover, providing applications on a mobile network is different from doing so over the Internet. For one thing, although the Internet is accessed primarily through mobile phones, mobile Internet is not a useful avenue for financial inclusion. The proportion of the population that has smartphones in Africa and India, while increasing rapidly, is still

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at best at or below 10 percent, and the higher penetration rate occurs in markets like South Africa, which have higher incomes and a greater number of urban users who have better infrastructure. Many markets have patchy GPRS (data) coverage, so certain applications will not work everywhere.[10]

A universally accessible network technology exists, called USSD (Unstructured Supplementary Service Data). USSD-based solutions, where the operator is able to provide applications directly over the mobile network to the end user in real time, is already used in many mobile banking and service deployments in Africa. USSD allows the operator to retain control over the application and keep cost and complexity to a minimum. USSD is supported on all mobile phones, even very low-end models, which enables an operator to make a service available to all users from day one. Furthermore, the capacity of the existing SIM card is irrelevant, as the network is doing the work, not the SIM card or the phone. The costs of providing services through USSD are very low, as any changes to the service are made available immediately rather than having to upgrade over the air.

However, USSD requires careful analysis of user interface and design, which is time-consuming and requires specialist skills. If done well, USSD can offer the first step to providing integrated services to the end user on the same menu and in a familiar format. Users do not need a new discovery process or awareness campaign for each new application: instead, the application appears as another menu item.

UNITING NETWORKS AND DEVICES FOR USERS BENEFIT

It may not need to be as stark a choice as offering a network-based or a SIM-card-based solution. Increasingly, the mechanics of upgrade and distribution can be managed behind the scenes with improvements and evolution in the SIM-card toolkit as more sophisticated SIM cards and handsets become more widely available. Phone ownership by an individual will also not be required in the future, as it should be possible to provide an application for several independent users on one device without requiring extra SIM cards. It will also be possible to log in to different applications on the same handset without needing a smartphone. Once some of these technical challenges will have been solved, operators and application providers can return to addressing the challenges from the users' point of view.

FINANCIAL INCLUSION THROUGH MOBILE: THE FUTURE

Mobile banking is a clear avenue for improving financial inclusion in an environment where infrastructure is challenged.

SIM-card-based finance solutions are widely deployed, have been very successful in growing financial inclusion, and are a valuable operator offering. For those remaining without handsets, SIM cards and mobile identity solutions can help to close the distribution gap.

In order to maximize financial inclusion while minimizing operator cost and end-user complexity, we provide some suggestions:

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- Invest in developing the skills and confidence in mobile use, particularly among women. Youth, who currently often mediate technology access, can also be strong advocates for change.
- Consider using a device-independent option like mobile identity in order to include those who do not own or cannot afford a handset: it cuts out the SIM card distribution cost
- Think of ways to make the financial services experience more social, and expect that people will return to groups for the support they offer as much as for the financial services component. The mobile service does not replace the social role of the group, but it can support it.
- Consider how to make mobile money and banking easy for the end user, delivered in a familiar format without the need to either learn another application or carry around a SIM card specifically for financial use.

Mobile money and banking solutions need to be marketed, segmented, supported by education, culturally appropriate, innovatively efficient, and combine the available potential of the network and the device. Only then will we start to unlock the potential of the currently unbanked and excluded.

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1. Movirtu's proprietary research among people at the bottom of the pyramid in India and Africa discovered that the concept of a mobile identity is preferable for women in particular, because it avoids both the physical risk of having a mobile phone stolen and the social risk of transgressing gender norms, which assume that women should not have access to technology
2. Movirtu's research shows that actual or potential theft of a phone is a major concern for people. See this recent story, in which SIM cards were stolen from traffic lights in South Africa, with serious financial consequences. Available at http://www.bbc.co.uk/news/world-africa-12135841.
3. CGAP Annual Report 2010. Available at http://www.cgap.org/p/site/c/financialindicators/.
4. All of our BoP research findings and material are freely available under Creative Commons. For a link to resources, please see www.movirtu.com/life-at-the-bop-study. All quantitative information is from proprietary research conducted by Taylor Nelson Sofres in the context of commercial implementations of Movirtu's technology.
5. Tanzania Women's' group, outside Dar es Salaam, August 2011.
6. Daryl Collins, Jonathan Morduch, Stuart Rutherford and Orlanda Ruthven, *Portfolios of the Poor*, Princeton, NJ: Princeton University Press, 2009.
7. GSMA MWomen study 2010. Available at http://www.mwomen.org/Research/women-mobile-a-global-opportunity_1.
8. *Times of India*, June 19, 2011. Available at http://articles.timesofindia.indiatimes.com/2011-06-19/india/29676266_1_mobile-phones-bans-unmarried-girls.
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10. See Balancing Act Africa for data on smartphone and Internet penetration in Africa. Available at http://www.balancingact-africa.com/reports/telecoms-and-interne/mobile-apps-for-afri1.

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