

# Rural Microfinance Service Delivery: Gaps, Inefficiencies and Emerging Solutions

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**Abstract**—Microfinance, the provision of financial services to poor and under-served communities, has emerged as one of the most promising avenues for stimulating rural economic development through local enterprise. In this paper we will discuss some of the major technology gaps faced by rural microfinance institutions, focusing on areas that are most important for the future growth of the industry. This work builds upon six months of field research, including field studies with eight different microfinance organizations located across Latin America and Asia, and discussions with many other organizations worldwide.

Historically it has proved difficult to provide sustainable micro-financial services to remote rural clients. As formal financial institutions begin to look seriously at this market, the microfinance industry faces significant challenges in maturing and scaling to sustainability. We will look at three of the major tasks faced by rural microfinance service providers today - 1) the exchange of information with remote clients, 2) management and processing of data at the institutional level and 3) the collection and delivery of money to remote rural areas. Each of these has been a difficult problem to solve for microfinance institutions worldwide, and may offer opportunities for information technology-based solutions.

For each of these “gaps” we will look at current best practices, examine the role information technology has (or has not) played in overcoming these obstacles, and discuss promising future directions. In this context, we will discuss the use of hand-held technologies for rural data collection, experiences in the implementation of MIS systems at the institutional level and current strategies for introducing electronic banking to remote rural areas. For each of these, we will look at the results obtained thus far and the potential ramifications for the long-term growth and sustainability of the sector.

## I. INTRODUCTION

Microfinance is defined as the provision of financial services to clients who have otherwise been neglected by the mainstream banking industry. These clients are excluded from mainstream banking primarily for reasons such as poverty, lack of education, living in a remote location, etc. Many kinds of organizations participate in providing microfinance services. These include non-profit organizations (both regional and international), private companies, financial institutions and registered banks. Throughout the rest of the paper such organizations will uniformly be referred to as microfinance institutions, or MFIs. The microfinance industry also includes other participants - such as state, local and national governments, independent rating agencies and other third-party observers.

As finance is primarily an information and capital-driven industry, one can expect that its pace of growth will be determined by the flow of these two important commodities. However in microfinance, as of yet, no definitive standards have emerged for managing either of these important value chains. Management and information systems for microfinance institutions are still in their infancy. Most MFIs still use basic software packages developed by local providers, and have difficulty in upscaling their systems or procedures. Money transfers are commonly handled in slow and inefficient ways, in the best cases by “piggy-backing” on the infrastructure of formal financial institutions. Most microfinance institutions still rely on manual data collection and entry to manage their incoming data.

However, big things are afoot. Mainstream banks have begun to look seriously at the microfinance market. As clients repeatedly prove their repayment performance, microfinance portfolios are becoming a reasonable investment option for those banks seeking to diversify their portfolio, expand their outreach, cater to their social conscience or meet government regulations.

Examples of mainstream banking companies working with microfinance institutions to provide capital have flourished in recent years. In the past five years, Citigroup Foundation has made \$17 million in grants to 178 microfinance partners in 50 countries [1]. Similarly, Deutsche Bank Foundation has recently launched the \$1.5 million microfinance financial development fund [2]. On a national scale, NABARD, the Indian National Bank for Agriculture And Rural Development, as of 2003 had provided almost \$200 million worth of capital to village microfinance groups through its SHG-bank linkage program [3].

One of the most active private banks working in microfinance has been ICICI Bank, the largest private bank in India. ICICI has been a pioneer in implementing new microfinance outreach channels, in partnering with MFIs and in providing low-cost sources of commercial funds. In the last year, ICICI has completed two portfolio securitization deals with microfinance institutions, with a total value of almost \$10 million [4]. ICICI has also supported several initiatives seeking to establish low-cost financial service delivery channels for rural areas, such as banking through Internet kiosks, smart-card and ATM-based systems.

As innovations like these continue and the formal financial sector becomes more involved in microfinance, it is clear that microfinance service delivery channels will have to become more streamlined, efficient and easy to manage, in order to serve larger numbers of clients and to connect the various stakeholders in the industry. In this paper we will look at three major technical challenges facing microfinance institutions in achieving these goals: 1) the exchange of information with remote clients, 2) management and processing of data at the institutional level and 3) the collection and delivery of money to remote rural areas. This report is the result of a six month research study, covering direct field observations with eight different microfinance institutions operating across Latin America and Asia, and discussions with many other MFIs worldwide.

For each of these "gaps" we will look at current best practices, examine the role information technology has (or has not) played in overcoming these obstacles, and discuss promising future directions. In this context, we will discuss the use of hand-held technologies for rural information collection, difficulties in the implementation of MIS systems at the organizational level and strategies for introducing electronic banking to remote rural areas. We will look at the results obtained thus far in each of these directions and the ramifications for the long-term growth and sustainability of the sector. We conclude by presenting some plausible models for the future of rural microfinance service delivery, based upon the currently observed trends and certain underlying principles required for meeting the industry's goals of sustainability, efficiency and maximum outreach.

## II. CHALLENGES IN RURAL MICROFINANCE SERVICE DELIVERY

In our time studying and working with microfinance institutions, we have found three common and persistent technical challenges for institutions in reaching their outreach and sustainability goals. These issues were common to the many different microfinance institutions we have visited, regardless of size, location, lending methodology, philosophy, etc. Much of the work addressing technology issues in microfinance fails to distinguish between these distinct problem cases, and therefore confuses the issues and approaches in dealing with each. In this section we discuss each of these challenges and the current approaches towards solving them, highlighting those solutions which have thus far seemed the most successful.

### A. Challenge 1: Collection of Information from Remote Rural Clients

According to Mohammad Yunus, founder of the Grameen Bank and one of the pioneers of microfinance, "the first principle of Grameen banking is that the clients should not go to the bank, it is the bank which should go to the people." [5] Dr. Yunus perceived that to alleviate other potential imbalances, financial services should be provided to poor people on their terms, in a manner that was respectful of their needs, activities and livelihoods. At the Grameen Bank, this means that "12,000

staff serve 3.2 million clients in 45,000 villages spread out all over Bangladesh, every week".

One can imagine the immense technical challenges involved in this. Conducting millions of small transactions every month in remote rural areas with very little infrastructure, on the barest of operating margins - this is an operations puzzle that would make most corporate managers queasy. "Bringing a bank" to 45,000 rural villages every week is not a simple thing to fathom. Most of this herculean task falls upon the shoulder of rural *loan officers*. Every day loan officers travel from village to village, documenting clients, processing applications, conducting meetings, collecting repayments, disbursing loans, resolving disputes and doing all of the basic customer-centric tasks upon which the entire microfinance industry relies.

Considering the problem in terms of information flows, there is a lot of data generated in each of these villages every week that needs to be collected in a timely and efficient manner. Every week new clients must be documented, loan applications processed and transactions posted. Moreover, expanding a microfinance institution's business requires knowledge about prospective customers also. Tools to research and evaluate new clients and credit applications are essential in growing a microfinance institution's business wisely.

Perhaps even more challenging is the thousands of transactions that have to be captured and processed every week in a timely manner, so that the institution can have an accurate view on its current loans, pinpointing delinquency and potential trouble spots. The institution must be vigilant about its loan portfolio and actively follow up on delinquent loans to achieve a rate of return on capital that is required to achieve sustainability and profitability.

There are several other factors that are also very important for the efficiency and growth potential of a microfinance institution. Two of these are in how quickly the loan officer can conduct daily client interactions, and the number of days it takes to process a new application for credit. This determines the amount of time loan officers have to develop new clients, and thereby the speed at which the institution can absorb more capital and expand its operations. As microfinance is a rapidly growing industry with a large untapped market, unpredictable growth is an important thing for microfinance institutions to manage, particularly in competitive markets.

To meet this challenge, several MFIs have turned to information technology-based solutions to optimize data collection. This refers to MFI initiatives that use some form of hand-held device to allow loan officers to perform electronic documentation and/or evaluate credit applications in the field.

SKS Microfinance, a MFI working in the drought-prone regions of Andhra Pradesh in India, has been one of the fastest growing microfinance institutions in the world over the past several years. Having commenced operations in 1997, as of 2003 SKS already worked with more than 40,000 clients [6]. It appears that the SKS' pace of growth is not slowing - in a recent 9 month period, SKS was able to double its number of clients. A result of this trend is that SKS has aggressively sought technology-based solutions that would allow them to

scale more rapidly and reach more clients in a cost-effective manner.

As part of this effort, in May 2001 SKS introduced a prototype data collection system using popular Palm Pilot PDA devices and smart cards. Loan officers used the PDAs to record client transactions in the field, which were simultaneously recorded on the smart cards that were provided to clients as a form of data backup. During the year-long pilot program, SKS tested the new system in two client centers, marking improvements in accuracy, loan officer productivity and operational efficiency. The initial pilot was supported through \$125,000 in grants and soft loans received from CGAP (the World Bank's apex body on microfinance), and two US-based non-profits.

Over the year-long pilot period, SKS observed a significant improvement in the accuracy of the records collected from the field and in the efficiency of their delivery to the central database at the head office [7]. However, the average reduction in village meeting time was only by 10%. After much thought, SKS decided to discontinue the pilot, citing prohibitive hardware and software costs. SKS is still optimistic about the potential for technology as a means to improve its efficiency and expand its operations. However, they are unsure about the use of PDAs and whether or not they represent a judicious use of resources in collecting information from rural clients [8].

Compartamos, a microfinance institution working in Mexico, has also grown very fast in a short time and now stands as one of the largest microfinance service providers in that country. Starting as a pilot project of another large Mexican NGO in the early 1990s, Compartamos became an independent microfinance institution in 1995, and since then has doubled its operations approximately every 2-3 years [9]. It currently reaches more than 150,000 clients located across Mexico.

Compartamos is supported by the international Accion network, which specializes in supporting a style of microfinance called *village banking* [10]. With the support of Accion, Compartamos undertook a pilot project to use Palm Pilot hand-held devices to aid in their field operations. However, unlike SKS, one of the primary motivations for Compartamos was in automating its loan application and approval process. As mentioned earlier, this is one of the key determinants of efficiency in the microfinance industry. Some organizations use detailed algorithms and calculations to decide which clients are eligible for receiving credit, and under what terms.

However, Compartamos, like SKS, has also discontinued its hand-held pilot project [11]. Once again citing high hardware and software costs, paired with additional difficulties in synchronizing the hand-held with the central MIS, management decided it had more important priorities than continuing the Palm Pilot experiment. While Compartamos and its technical advisers are still optimistic about the use of PDAs in the field, convincing evidence to support their use given current resource limitations has been hard to come by.

Another example of an organization experimenting with Palm Pilot technology to optimize field operations can be found in the Grameen Bank's own backyard in Bangladesh.

SafeSave is a relatively small microfinance institution working in the urban slums of Dhaka, the capital city of Bangladesh. One of the novelties of SafeSave's approach is that it is a savings-led approach - the organization focuses on building clients' savings first, and only issues credit that is secured against a client's future or past savings [12].

This is notable, as offering a flexible savings product has long been one of the main challenges facing microfinance institutions worldwide. Clients have often demanded access to flexible savings products, and in fact some observers view microcredit loans as one form of "after-the-fact" savings for clients [13]. However, due to difficulties in accurately capturing savings transactions of unknown value and protecting against internal and external fraud, savings has been one of the most difficult services to offer to rural microfinance clients. Loans are easier for MFIs to manage in that the value of the expected payments and collections for the day is known in advance before the loan officers go out for their rounds. In some countries there are also government stipulations that restrict the kinds of savings products microfinance institutions are allowed to provide to their clients. Lastly, and most importantly, MFIs have yet to find a way to get money into and out of villages cheaply and efficiently enough for offering a cost-effective savings product. The result is that very few microfinance organizations have been able to offer safe, flexible savings to their clients.

SafeSave, supported by a \$15,000 donor grant, is in the midst of a two-year experiment using Palm Pilots in two branches with about 3000 clients [14]. Similar to SKS, SafeSave is using relatively inexpensive PDAs (approximately \$100 each) to document transactions in the field and to automatically upload these transactions to the organization's central database. SafeSave's management has noted several benefits thus far, including better use of staff time, faster loan processing, adherence to rules and regulations and more accuracy. However, they have also noted that "cost savings is not really the big driver - direct expenses per transaction is likely to be at least as much as paper and manual data entry." [14] In an industry driven by scale and the slimmest of operating margins, it remains to be seen whether SafeSave will continue the pilot when it comes down to using their own hard-earned funds.

One of the few microfinance institutions that has been unequivocally positive about the use of PDAs in the field has been Basix. Basix is one of the largest MFIs in India, operating in six states and serving over 150,000 clients. Together with its technology partners, Basix has invested a lot of time and resources in IT solutions supporting its operations. This includes an MIS solution with an integrated mobile solution for the field, using high-end hand-held devices from Oregon Scientific [15]. Basix has even created an independent consulting arm which implements this MIS at other microfinance institutions.

Basix has noted many benefits from its mobile computing solution. This includes a reduction of transaction costs, improved accountability, speedier synchronization with the central MIS (Basix's solution includes a wireless uplink feature

allowing remote synchronization) and increase in customer trust by providing printed receipts in the field. The project's managers noted only small, easily overcome technical problems in the initial implementation. In use since September 2001, in its first 18 months of operation the system was used to process over 50,000 transactions with a cumulative value of \$450,000 [15].

Basix has clearly spent a lot of money on this solution - it relies on more expensive hand-held devices with add-ons (modem, printer) not seen in other prototype deployments. Basix made a huge capital investment to support the development and roll-out of this system. According to reports, Basix has spent more than \$500,000 in developing its information technology infrastructure, including a \$350,000 assignment from the International Finance Corporation and additional support from the Small Industries Development Bank of India (SIDBI) [16]. Basix may be reaping the rewards of this investment, but it is hard to imagine many microfinance institutions having access to the capital resources needed to develop and support such a system.

As noted in a recent CGAP article, institutions commonly spend between \$20,000 and \$80,000 on their mobile computing implementations, plus hardware costs, plus yearly maintenance costs ranging between \$3,000 and \$8,000. These solutions have been developed over time frames ranging from 9 months to two years [11]. As in the case of Basix, sometimes the investment can be much more than this. It is apparent that the integration of mobile hand-held computing for collecting field information is an expensive and time-consuming process, and only those institutions that are willing to invest the time and money are going to reap significant rewards. In an industry where there is little free money and even less free time, it is not surprising to find that most of these prototypes have been discontinued due to inconclusive results.

This is especially true given that many other institutions have been successful managing their field data requirements using manual, paper-based methods. Paper is a cheap, flexible, readily available information medium that can serve almost all of the same purposes that a mobile computer can in the field - the ability to collect and deliver information - albeit less efficiently than using electronic methods. Where labor costs are low and tolerance of delay is a cultural phenomenon, this is not nearly enough of an incentive to switch to prohibitively expensive solutions for marginal improvements in efficiency.

The Grameen Bank has long emphasized the importance of standardized procedures and processes rather than technology-driven solutions. In a discussion with an experienced Grameen Bank district manager, he stressed that it is important to inculcate loan officers with the importance of following proper procedures in client management and documentation. In his view, experience with manual, paper-based MIS procedures helped rather than hindered loan officers' understanding of these standards. By performing these operations manually they become more familiar with the data that is collected in the field and how it is used within the institution.

## *B. Challenge 2: Management and Information Systems at the Institutional Level*

Over the course of a six-month investigative project, the author had the opportunity to visit eight microfinance institutions and observe their MIS (Management and Information System) implementations. Five of these MFIs were in India, while the other three were in Central America. They ranged in size from medium to small, between 10,000 to 50,000 clients, and practiced various forms of microfinance lending methodologies. Some of the observations in India were collected while working as a consultant evaluating MIS implementations. The remaining observations were collected as an observer on field visits with the Grameen Technology Center's Microfinance Automation project [17].

Over the course of these visits, we observed many common trends. Six of the eight organizations we visited were using a system based on Microsoft's Visual Basic and Access software development packages [18]. Of the remaining two, one MFI was in the process of migrating from an existing Delphi application to a PHP / MySQL solution that was developed in-house. The other did not have a computerized MIS, managing all of its data using paper ledgers.

Visual Basic is a software development platform that uses a simple programming language to develop single-user client applications. It is designed to be used with Microsoft's Access database, a simple non-relational database typically meant for use on a single workstation. Due to this combination's ease of use and the abundance of training materials, Visual Basic and Access programmers can be found in almost any corner of the globe. This makes applications based on this platform the easiest and most inexpensive to develop and maintain.

However, this platform also has significant limitations. The Visual Basic programming language does not support a modular separation of the user's view of an application from its implementation, which is a fundamental driving principle in the design of modular, extensible software. Moreover, the Access database is not a true relational database. It is not meant to be used in client-server applications and can not reliably handle multiple users, excessive load or large data sets.

Many MFIs have experienced difficulty expanding or modifying software based on this architecture. Either when they sought to diversify into new financial products, adapt an existing software to their needs, or grow towards a multi-user client-server architecture - it was not found to be a flexible or scalable enough platform upon which to implement the new requirements. As a result, institutions had to spend excessive time, money and resources to develop a completely new system or completely redesign their existing one.

However, VB / Access based solutions are currently the runaway leader when it comes to microfinance MIS implementations all over the world. Why is this the case? Out of the eight organizations we visited, five of them had developed the software locally (two had developed or were developing in-house solutions and three had sourced solutions from a local

software provider). Of the remaining three, two were in the process of migrating from a software developed by a local provider to a specialized microfinance package developed by an international provider. Only one organization had started with a system developed by a non-local software provider that had any previous experience developing microfinance MIS systems.

In this kind of market - driven by specialized, local software development - one can expect a lot of “re-inventing of the wheel”. Microfinance institutions are continually re-developing custom MIS applications with little potential for scaling or future adaptation. Often driven by programmers without significant technical experience, these systems have had difficulty when it comes to adapting for new purposes, or scaling for multiple users. In fact, only those MFIs that have a full and capable in-house IT team have had any success in these conditions. This is a luxury that most microfinance institutions do not have the resources to support.

The situation is not much better for those MFIs working with solutions developed by an international software provider. Often, the international provider could not provide the training, support and small customizations that the MFI might require. The MFI was most often left no choice but to learn on their own, and adapt their processes towards those supported by the software. Lack of technology capacity in many microfinance institution leaves them very limited in their options for handling these situations. Once again, those institutions with permanent, capable in-house IT teams were invariably better off.

The two international software products that we observed were both developed by relatively small software houses focused on developing microfinance applications. Both were based on the Visual Basic / Access platform. International microfinance software providers who offer more high-level products have had difficulty in finding a market. Many of these products come from a commercial banking lineage, and are therefore not fully compatible with some of the special features of microfinance (solidarity lending, group meetings, no collateral, etc.). Usually these international solutions are only used in cases where there is very strong donor support for the system that can pay for some or all of its implementation. Even in these cases most implementations have not been successful. MFIs are far more comfortable working with local technology service providers.

So this is the situation that we are left with - a fragmented international microfinance software market where no clear industry standards have emerged and the vast majority of current MIS implementations are unsuccessful, flailing or barely meeting the institution’s information needs.

The demand for MIS is driven by the outputs - performance reports for donors and creditors, analytic reports for directors and senior management, and operational reports for staff and clients. Currently, much of this demand is met through arduous “information” labor - picking through disparate sources to compile consolidated Excel reports. This is a grievous waste of time for already overburdened individuals. Moreover, outside

information recipients, whether they be donors, creditors or third-party evaluators, can never really be sure of how figures were calculated and how accurate they are. In an industry where information is such an important commodity, this is a cause for immediate and significant concern.

### *C. Challenge 3: Conducting Financial Transactions in Remote Rural Areas*

The one thing that we found as an almost universal challenge in microfinance institutions was the collection and disbursement of money in the field. Historically this has been done by most microfinance institutions in a cash-centric, labor-intensive way. In the most common model, transactions are conducted directly between loan officers and clients. Cash payments are collected in the field by a loan officer and returned to the branch office. There the branch manager collects money from all of the loan officers, to deposit in the bank either that or the following day. Loan disbursements are handled similarly, loan officers will travel to the field to disburse the loan to the client.

If there is a nearby bank that will cash checks for microfinance clients, the branch manager may disburse loans in the form of checks to the recipients. It is the responsibility of the loan recipient to go and cash the check at the nearest bank branch. In India, there is a widespread regional rural bank (RRB) network that is supported by the central government. Many microfinance institutions in India have established relationships with these rural banks to make it easier for loan recipients to cash checks at the nearest possible location.

In some cases, bank branches are not accessible nearby, or they will not deal with what they perceive as poor, uneducated microfinance clients. In this case, loan officers would need to travel to villages regularly with large amounts of cash. Due to safety and security issues, MFIs generally do not recommend this and instead require clients to come to the branch office (usually in pairs, again for security reasons) to collect the loan.

For clients, cash transactions are clearly the most convenient. However, security issues make cash difficult to transport into and out of villages. As microfinance groups meet on a regular schedule, it would be easy for a potential thief to predict when a loan officer might be traveling through an area with a significant amount of cash. In one of our visits, we heard of a loan officer who was murdered during such a robbery. In another case, an MFI had to equip all of its officers with a private vehicle because it was found not to be safe to ride the public bus to meetings.

Transacting in cash also increases the potential for fraud by loan officers. In several cases, we heard of loan officers who had under-represented loan repayments, only to be caught days or weeks later. This is the one reason that microfinance institutions cannot offer flexible savings products to their clients. Even if it was allowed by the government, it would be too difficult for the MFI to track how much money a loan officer should be bringing back and forth from the office every day. This would leave the door wide open for fraud that could take weeks if not months to track down.

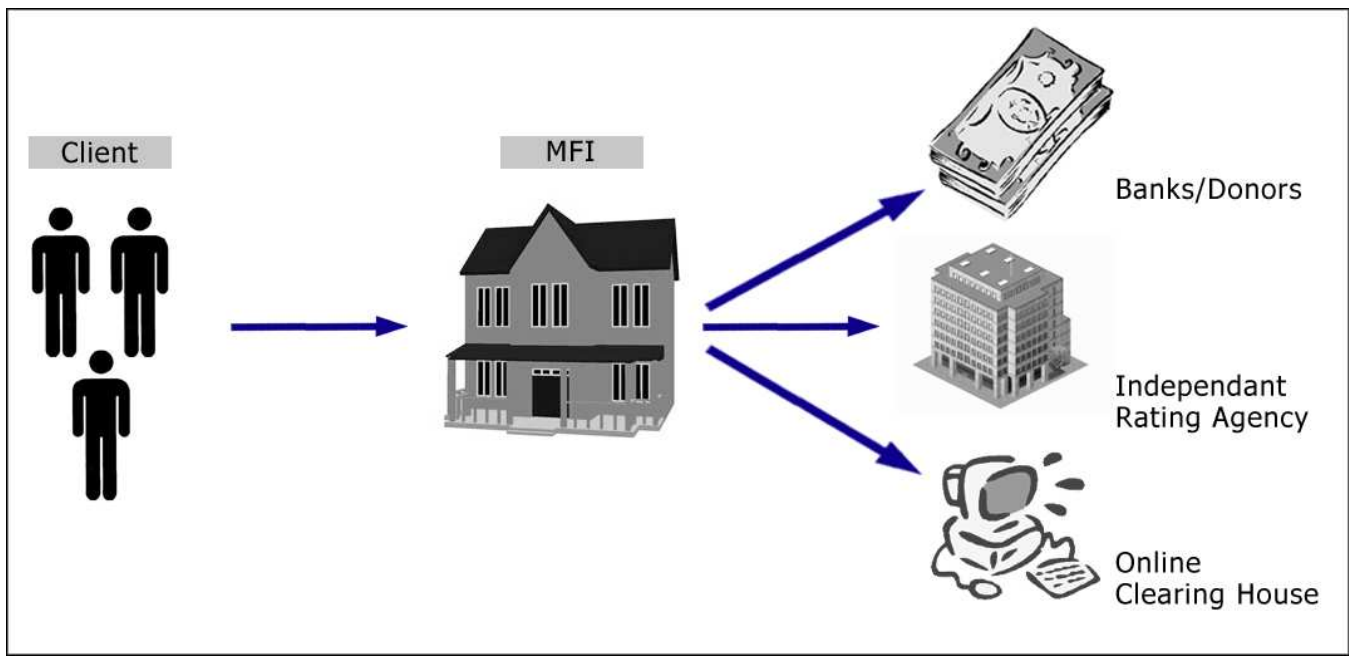


Fig. 1. Information channels in microfinance.

To meet these challenges, many microfinance institutions are starting to lean more heavily on local bank branches for handling their cash transactions. In addition to doing loan disbursements via check, they have also begun to collect repayments by asking clients to make deposits in specified accounts at local bank branches. The clients then bring the processed deposit slip to the group meetings as proof of their payments. The MFI transfers these funds out of these “dummy” local accounts into their main institutional accounts. Of the eight microfinance organizations we visited in the study, all of them had begun to collect some or all of their loan repayments in this manner.

However, this is not seen by most observers as a long-term, internationally applicable solution. Rather, this is seen as a short-term way to shift risks and expenses from microfinance institutions to clients and regional rural banks (and indirectly to the government that subsidizes them). In almost all other countries and locations there are not these extensive rural bank networks for MFIs to rely on. In these places it is the client that spends the time and money to travel to bank branches and conduct transactions.

In India, regional rural banks are essentially providing a free service to microfinance institutions. The money is not left in their accounts for long enough to earn any appreciable interest, nor do they charge a per-transaction service fee. Due to the small value of microfinance transactions, any reasonable charge would be proportionately too small to make any business sense for the bank. Therefore, with no sound business case linking them, the relationship between microfinance institutions and regional rural banks can be very inconsistent. In many cases, the MFI must spend significant time lobbying the bank’s local management before they will

provide service to their clients. If this does not work, they must appeal to the bank’s central management.

We observed an interesting example of this scenario during our visit to CASHPOR, a microfinance institution operating in eastern Uttar Pradesh, India. CASHPOR is collaborating with ICICI bank in a new model for microfinance. In this model, CASHPOR manages all of the field operations - recruiting clients, managing group meetings, processing loan applications, issuing disbursements, collecting repayments and following up on delinquent loans. For their part, ICICI provides all of the loan capital. CASHPOR receives a 5% service charge on each loan disbursed to meet its operating expenses. All of the remaining interest and principal repayments should go directly back to ICICI.

We say that the payments *should* go directly between ICICI and the clients, but that is really not the case. Once again, the regional rural bank network must handle the brunt of the cash handling. When ICICI sanctions a loan, it transfers the required capital to CASHPOR’s account with ICICI. After collecting its 5% service charge, CASHPOR transfers this money into an account with the regional rural bank, so that it can issue a bearer check to clients to disburse the money. Deposits work the same way. Clients deposit money into CASHPOR’s account at the regional rural bank, which CASHPOR then transfers to its account with ICICI, which is eventually debited back to ICICI’s consolidated portfolio account.

Because all of the loan capital is provided by ICICI, CASHPOR is able to focus on its role of developing clients and their businesses. They do not have to worry about where the capital will come from as long as their clients can keep finding a way to use it. This gives them a lot of leverage in aggressively

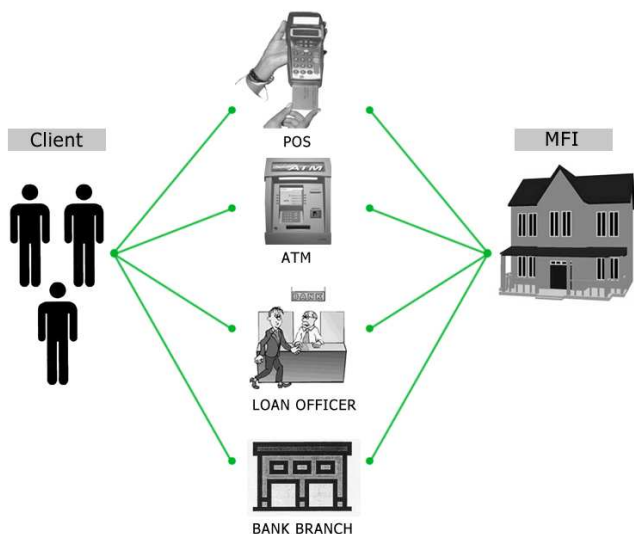


Fig. 2. Rural cash handling options for MFIs.

pursuing new clients and expanding their operations. However, the regional rural bank branch must still handle the thankless task of processing the cash transactions in the field, for which they receive no financial retribution or gain.

Another problem in this approach is dealing with cash inactivity. Due to delays and inefficiencies in India's funds transfer network, money transfers from a central bank to a regional rural bank branch may take inordinately long. In this case, the transfer between ICICI's consolidated account and CASHPOR's rural bank account takes up to seven days in each direction.

Bindu Ananth and Bastavee Barooah of ICICI Bank's Social Initiatives Group discuss the indirect costs associated with these slow cash transfers [19]. While funds are in transit and therefore financially idle, someone must pay for the interest that should be accruing on that money. This can be a major cost for microfinance institutions, and has been an issue at every microfinance institution that we have visited. In many cases, this cost is passed on to the clients. In other cases the institution has to bear this financial cost. In inflationary economies the problem is exacerbated.

As Ananth and Barooah mention in their article, "the challenge for banks is to innovate a low-cost network / delivery channel with a high outreach and flexibility with respect to the timing of its operation." [19] Rural transaction processing has been one of the areas of most intense technological investigation for MFIs. There are many factors in the successful design of an electronic banking solution for remote rural areas. These include hardware costs, communication costs, geographic accessibility, power requirements, connectivity requirements, government regulations and customer acceptance. Any successful solution must address all of these important issues.

Several initiatives have developed low-cost ATMs suitable for the microfinance market. ICICI is working with IIT-

Madras, one of the premier technology universities in India, on the development of a low-cost ATM machine [20]. The current prototype carries a price tag of 30,000 Rupees (approximately \$700). This is a quantum leap from the costs of a typical commercial ATM, which can range from anywhere between \$15,000 to \$30,000. It is also planned that IIT Madras's ATM will eventually include built-in fingerprint identification and web cameras for identifying clients.

Another project using low-cost ATMs is underway in Bolivia. PRODEM is a large Bolivian microfinance institution that is one of the widest reaching financial service providers in that country. Since early 2001, PRODEM has established a dedicated ATM network across all of its branch offices and at many other standalone locations [21]. Clients have found it very convenient to conduct transactions at any time using this extensive network.

PRODEM's ATMs leverage technologies such as touch screens, fingerprint recognition, smart cards and a multi-lingual voice interface to serve its mostly illiterate, ethnic minority clients. This is done at a cost of only \$18,000 per ATM, still significantly less than the prices offered by commercial vendors. PRODEM achieved this cost savings by building its own machine sourced from local hardware providers.

While this project has been a success at PRODEM, so far the cost and infrastructure requirements of ATMs have remained prohibitively high for most microfinance institutions. Even these "low-cost" ATMs are still out of the financial reach of most MFIs. A more economical approach relies on "human-mediated" ATMs. In this case, the client conducts transactions with a local human proxy (a merchant or trader), who is equipped with a Point-of-Sale (POS) device. These transactions are conducted on behalf of the MFI or bank, and securely stored on the client's smart card. The MFI can later collect the money from the merchant and issue some payment in exchange for his services.

Several initiatives in Africa are currently testing this *agent model* [22]. One project is led by Hewlett Packard and an association of large international MFI networks. They are seeking to develop a generic Rural Transaction System, suitable for conducting many kinds of transactions [23]. This project is currently entering a trial deployment, and expects to have the results of this pilot by the end of the year.

POS devices have been used in similar trials in India by ICICI bank in Karnataka and the Warana sugar cooperative in Maharashtra. So far the major impediment to their success has been the cost of the POS device, which can range between \$100 and \$300 dollars. It has been difficult to convince merchants of the value of this investment without a proven cash flow in place. This has led some to posit that these small rural businessmen may not be the best place to introduce new technology. Merchants currently have no stake in the relationship between clients and the microfinance institution. Therefore, it might be better to first install POS devices in branch offices, so that local merchants can have an opportunity first-hand to see the value of the device and the potential

customer traffic that can be generated.

POS devices have been successfully used in closed-loop economies, such as the Warana sugar cooperative in Maharashtra. In this case members of the cooperative are paid via deposits on a smart card, which can later be used to buy agricultural inputs and other goods from the cooperative's stores. While this is not strictly a microfinance scenario, it does illustrate the fact that to effectively implement a smart card solution one must have an influence on both the source and eventual destination of the currency.

Another "human-mediated" approach uses an Internet kiosk instead of a POS device to connect to an on-line banking application. The merchant records transactions on the kiosk, and the client is provided with a paper receipt. ICICI Bank has been trying to prototype such a solution with some of its MFI partners in Madurai, India. ICICI already supports several community Internet and tele-center projects in the region, and using these facilities to provide banking services is a natural extension of these efforts [24].

However, ICICI has been limited in this effort by Reserve Bank of India (RBI) regulations that explicitly prohibit such "proxy" banking. ICICI is actively lobbying the RBI for an easing of these regulations, but they will need to prove that there are security mechanisms in place that will limit the potential for abuse by proxy bankers before this approach is accepted by customers or the government.

With all of these experiments still underway, so far it is safe to say that the best solution for rural cash management has yet to emerge. All of the solutions developed thus far have been limited by factors of cost, infrastructure, government policy, customer acceptance, or a combination of these. As technologies mature and we learn about the results of some of these initial trials, there should be continued development in this area.

### III. FUTURE SCENARIOS

As we discuss the future of rural microfinance service delivery, we must also keep in mind that microfinance is a young and evolving industry. Only very recently has it been seen on an international scale as a viable commercial opportunity, and not as a fringe activity for non-profit organizations. As the industry develops it is quite likely that we will see some shifting of roles and responsibilities in the microfinance sector. In this section we discuss some ways in which that could happen.

Currently, several large international and national banks have already or are seriously considering entering microfinance as a potential commercial market. Several such examples have already been discussed in this paper, and there can be no doubt that there is a buzz around this trend in the industry. As long as microfinance clients continue to prove their repayment performance, and low-cost delivery channels can be innovated, there is no reason to believe that commercial banks will not become more involved in microfinance in the coming years.

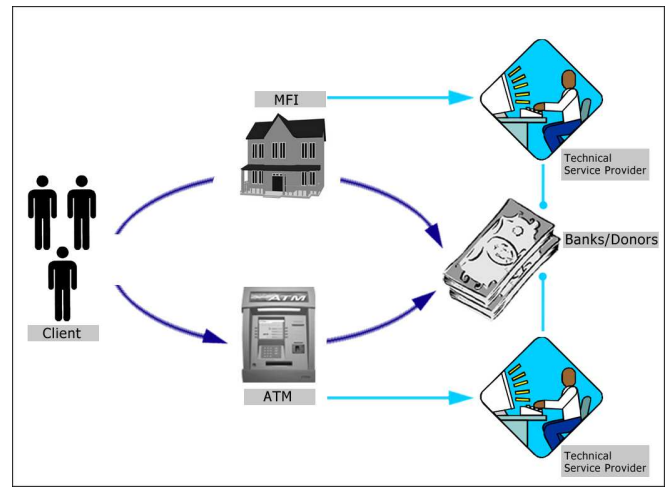


Fig. 3. Future scenarios in microfinance, and the potential role of technical service providers.

However, there are some aspects of providing microfinance services that most banks probably will never do, at least not as they are currently structured. Most people familiar with microfinance will agree that there are three very important factors in running a successful microfinance operation - 1) vision from the top, 2) reliable information systems, and 3) quality field staff. If the top-level visionary provides the brains, and the information systems are the nerves, then it is the field staff who truly form the heart of the microfinance institution. Field staff carry out the key tasks involved in managing relationships with clients. It is they who are the true "bankers to the poor", and it is on their work that the economic development (and hence repayment performance) of the clients truly depends.

Good field staff are grassroots people who understand the rural scenario and can relate to microfinance clients. They must interact daily with clients - training and advising them in their financial decisions. Moreover, this relationship must be driven by a coherent vision from the top that directs their activities for the financial betterment of the clients. While a bank is certainly better equipped in terms of access to resources, capital and existing information systems, it is the microfinance institutions and their understanding of the rural context that provides the underlying vision and forms the grassroots backbone of the industry.

While private banks may eventually choose to develop an integrated grassroots arm for reaching out to clients, currently it seems too expensive and too far from their core strengths to happen any time soon. More likely, we will see an increase in partnerships such as the one between ICICI Bank and CASHPOR - where a mainstream bank looks at a microfinance institution as a grassroots partner that allows it to effectively offer financial services to the rural poor.

However, the same trend may represent a fork in the road as far as MFIs are concerned. Most microfinance institutions are happy to partner with banks in order to access more capital for



their clients. At the same time, many institutions are finding it difficult to cope with the strain of rapid growth and increased financial accountability that goes along with these new formal relationships. They find that they do not possess the capacity to manage the new requirements effectively, and may even see it as a distraction from their core social agenda.

In the future, one may begin to see more off-loading of administrative and IT-related tasks from MFIs to partner banks or to other third-party service providers. The MFI may still handle basic data collection and manual, paper-based administrative duties internally, but most of the computerized data processing, analysis and reporting may be out-sourced to institutions with more technical capacity. This out-sourcing could be done to a partner bank, who maintain a single consolidated department that looks after the MIS systems of several partner MFIs, or it could be done to a private service provider that specializes in maintaining the MIS systems of MFIs on a contractual basis.

Additionally, the bank (or service provider) may implement its own rural transaction infrastructure, such as an ATM or POS network, to save MFIs from the arduous task of cash management. This would leave the MFIs relatively free (and unprejudiced) to focus on their main tasks of recruiting clients and helping them in their financial betterment.

Alternatively, some MFIs may choose to incorporate into private companies, and focus on building their own technical capacity to effectively provide microfinance services. Examples of this abound already - many of the largest microfinance institutions in the world either started as or transitioned to become commercial for-profit entities focused on providing microfinance services. The social agenda would largely become secondary for these organizations, as it already has in many cases. This can be addressed by working with non-profit and development organizations specializing in social causes.

In either case, as the industry matures, the door seems wide open for third-party service providers to enter the market and perform the tasks that neither banks nor MFIs want to do. This could include outsourcing of the entire MIS and other administrative applications to an on-line application service provider (ASP). The ASP model is becoming popular in the mainstream corporate sector (for example, see [www.salesforce.com](http://www.salesforce.com)). MFIs would be the perfect candidates for outsourcing such applications to an external service provider. Another business opportunity lies in building and implementing low-cost rural transaction channels that can be used uniformly by banks and microfinance institutions. It remains to be seen which of these business opportunities will be taken and which will remain viable with the continued development of the microfinance industry.

#### IV. CONCLUSION

However these scenarios resolve themselves, we feel that the future of microfinance depends on certain guiding principles that determine the health and stability of any evolving industry. In some sense the future of microfinance will depend on the answers it chooses for the following key questions:

- **Specialization** - What roles will various industry actors assume, and what strengths will they specialize in? What new business opportunities will be created? Will there be anyone left to play the social development role currently undertaken by non-profit institutions working in microfinance?
- **Standardization** - What standards of operation, information exchange and accountability will the industry agree to? How can we make sure such standards remain transparent and allow for the widest possible participation?
- **Systemization** - What supporting systems will emerge to govern these new structures? Who will ensure that they remain fair, impartial and beneficial for all involved?

It is an exciting time to be working in the microfinance industry. As the microfinance movement evolves from a social undertaking to a commercial one with strong social underpinnings, it will be interesting to see how it handles some of the conflicts that are sure to arise. It is a novel case merging capitalism and the common good, and, if handled properly, could prove to be a truly international success story where the end result is the upliftment of many human beings.

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