
THE FOUNDATION FOR
DEVELOPMENT COOPERATION

# Electronic Banking with the Poor

## Increasing the Outreach and Sustainability of Microfinance through ICT Innovation

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## Forward

> *"Innovation is the specific instrument of entrepreneurship. It is the act that endows resources with a new capacity to create wealth."* – Peter Drucker (Innovation and Entrepreneurship, 1985)

Providing financial services to poor people is expensive. Poor people have small amounts of money, many live in sparsely populated areas, and they rarely have a credit history lenders can reference to make credit decisions.

High transaction costs have limited the number of people who have access to formal financial services, especially those who are very poor or live in remote rural areas. For decades, thousands of specialized microfinance institutions (MFIs) have wrestled with a difficult choice: struggle to cover costs by delivering services to these excluded populations, or earn profits by making larger loans to customers who are better off. For most commercial banks and other mainstream financial institutions, the choice was clear. Customers who seemed unlikely to yield profits were largely ignored.

According to Peter Drucker, innovation is the answer to reducing costs, and to solving the tension between sustainability and reaching the very poor. By creating new channels that deliver financial services at low cost, entrepreneurial banks and MFIs may find that these customers, who once seemed beyond the frontier of formal financial services, are in fact a profitable and attractive market.

Now is the time to better understand how innovations in information and communication technology (ICT) can contribute to expanding the frontier of formal financial services. ICTs, such as PCs and other devices, are becoming more available and less expensive in many developing countries. Banks in many emerging markets are adopting technologies, such as mobile phones and automated teller machines (ATMs), and are growing at 20 percent per year. Increasingly, they seek untapped markets in which to expand. Finally, governments, donors, and civil society are devoting substantial resources to bridging the digital divide -- putting technology in underdeveloped areas where it can help deliver essential government and social services.

How will we recognize success in ICT innovation? Peter Drucker rightly argues that every innovation must be judged by its ability to generate wealth. Banks and commercially oriented MFIs will use ICTs to serve the poor only if doing so is profitable.

But those of us who aim to build inclusive financial systems should place an additional test on ICT innovations. Can these innovations reduce costs to such a degree that they can help profitably serve even very poor and remote populations? Will they earn customer trust, and be designed so that they can be used by those who cannot read and write?

If we can develop and promote new approaches that meet these tests, we will have solved a central problem in microfinance -- the tension between the goals of reaching poorer people and that of earning profits. We will have found a way for every financial institution, profit-maximizing and socially motivated, to serve poor customers and fulfill its mission.

This volume attempts to address the challenges posed above. It is written by entrepreneurs from around the world who are pursuing ICT innovations for microfinance, and those who work alongside them. The compendium will be valuable for those pursuing ICT experiments, but also for readers in a position to influence the environments in which these innovations take place.

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## Papers and Contributors

***Increasing the Outreach and Sustainability of Microfinance through ICT Innovation***
Stuart Mathison, Program Manager, Foundation for Development Cooperation

***Rural Microfinance Service Delivery: Gaps, Inefficiencies and Emerging Solutions***
Tapan Parikh, Department of Computer Science, University of Washington

***Banking the Unbanked: Technology's Role in Delivering Accessible Financial Services to the Poor***
Janine Firpo, Chair, Sevak Solutions

***Management Information Systems for Microfinance***
Ali Ahmad, Chief Information Officer, The First Microfinance Bank Ltd, Pakistan

***ICT in Microfinance: A Bangladesh Perspective***
Md. Badruddozza Mia, Coordinator, Computer in Development Programme, PROSHIKA

***Brazil's Banking Correspondents***
Gautam Ivatury, Microfinance Analyst, CGAP – World Bank

***Extending Banking to the Poor in India***
Amit Singhal & Bikram Dugga, ICICI Bank, India

***Remittances, Microfinance and Technology***
Chandula Abeywickrema, Deputy General Manager, Hatton National Bank, Sri Lanka

***Microfinance Needs a Common Platform for Access to Capital and Scalable Operational Systems***
James Dailey, Technical Project Manager, Grameen Foundation USA

***Harnessing Technology to Transform Financial Services for the Poor***
Gautam Ivatury, Microfinance Analyst, CGAP – World Bank

***Electronic Banking for the Poor - Panacea, Potential and Pitfalls***
David Cracknel, Banking Systems Specialist, MicroSave

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- ***Harnessing Technology to Transform Financial Services for the Poor***
  Gautam Ivatury, Microfinance Analyst, CGAP
- ***Electronic Banking for the Poor - Panacea, Potential and Pitfalls***
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# Increasing the Outreach And Sustainability of Microfinance through ICT Innovation

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*Making financial services available to the poorest people, especially investment loans for micro-business development, is recognized as an important part of poverty reduction strategies. However, in spite of its successes, microfinance has barely scratched the surface of need. While "increasing outreach" has been the catch-cry for at least the last five years, the present delivery models are not quite meeting the challenge, especially when it comes to serving communities in remote locations characterized by low population density. Technological innovation is the great hope, although it brings with it fundamental changes to the microfinance delivery mechanisms that have become almost sacred for the microfinance sector.*

## Up-scaling ICT For Development – A "Demand-Side" Approach

Since the emergence of a distinct ICT for Development (ICT4D) sector, advocates have said that ICTs are "enablers" or "tools" for development, rather than ends in themselves. The implication of this is that impetus for upscaling ICT4D will primarily come from the demand-side. Advocates not only need to demonstrate effective ICT4D applications but, more importantly, they need to find those applications that capture the imagination and involvement of many, and provide a compelling case for investing in ICT infrastructure and for getting the ICT policy and regulation framework right.[1] ICT-enabled banking services for the poor may be one such application.

Electronic commerce has its genesis in the banking sector. Over the last three decades, banks have transformed their business from paper-based systems to fully integrated ICT-enabled systems. E-commerce has become so ubiquitous that, in some economies, cash is now almost superfluous. Cash is used for only the smallest transactions and even this is poised to be replaced by a "micropayments" service, where consumers pay for small items through their mobile phone, or through a value-carrying smart card. It could be argued that ICT-enabled banking services were the application that propelled us into the "Information Economy".

Might the same evolution occur in less developed countries? At this point in time, many microfinance practitioners see ICT innovation as a key strategy in efforts to take microfinance to the next level in terms of outreach and sustainability. The pending roll-out of ICT-enabled microfinance services represents a paradigm shift for the sector. It will change fundamentally the business models and methodologies that microfinance practitioners hold dear. All of this makes the subject of "Microfinance and ICT Innovation" quite central to the Poverty Reduction agenda, whether one approaches that agenda from a microfinance point-of-view or an ICT for Development point-of-view.

2005 is an opportune year to progress the "Microfinance and ICT Innovation" discussion, being the International Year of Microcredit and also the year of the second phase of the World Summit on the Information Society.

[1] In English-speaking, developed country contexts, these applications have been referred to as "killer applications".

## Introduction to Microfinance

Microfinance is the provision of relevant and affordable financial services to poor households. The "micro" prefix refers to the size of the financial transactions; it does not imply that the microfinance providers (MFPs)[2] themselves are small.[3] Microfinance is primarily concerned with credit and savings although, in recent times, allied services such as insurance, leasing, payment transfers and remittances are being introduced to the mix. In the early days, the forerunner known as "microcredit" was focused on providing working capital to people who generate income for themselves in very small business activities. While this important emphasis remains, the sector has broadened its definition to *the delivery of financial services to poor households so that they can manage their financial resources more effectively*. Hence the more recent but broader descriptor, "microfinance".

Providing microfinance to poor clients requires innovative operating methods to manage risk and reduce transaction costs. Poor households do not usually have physical assets to offer as collateral for loans, so MFPs have developed substitutes. The most common form of substitute collateral has been the formation of groups of borrowers and the establishment of joint-liability procedures, where loan group members effectively guarantee one another's loans. To reduce transaction costs, MFPs primarily deal with these loan groups rather than with individual clients, and they outsource certain administration tasks to the groups.

Some MFPs have developed from existing community-based savings and loans cooperatives. In India, for example, these are referred to as "self-help" groups. Other MFPs have evolved out of the revolving loan programs of charitable non-government organisations, which offered loans to help beneficiaries develop income-generating activities. Other MFPs have been established by commercial banks or government-owned development banks, either as a response to their observation that providing financial services to the poor could be a suitably viable business opportunity, or as a response to government edict that they provide financial services to all strata of society, including the poor.

Since the early 1990s, a major emphasis within the microfinance sector has been on institutionalization of microfinance activities, including building the quality and capacity of the governance and management of MFPs, and the development of computerized Management Information Systems (MISs). This institutional development is necessary for a number of reasons. First, if MFPs accept client deposits, they are generally required to meet prudential requirements as defined in local banking laws. Essentially, they are required to become licensed banks. Second, institutional maturity is needed to enable and manage growth in client outreach. Growth in the client base allows the MFP to reap advantages of scale, thereby achieving a greater degree of financial sustainability.[4] Third, institutional maturity is necessary to attract capital investment, whether concessionary or commercial, from external sources.

The overriding mission of an MFP is to provide financial services to poor households on a financially sustainable basis. While most MFPs have a pro-poor, development-oriented emphasis, they are more correctly understood as banks rather than as (charitable) development organisations. Indeed, many MFPs are licensed, commercial banks.

[2] Throughout this paper I refer to "Microfinance Providers" (MFPs) rather than the more common "Microfinance Institutions" (MFIs). Increasingly, commercial banks in developing countries are providing microfinance either directly through in-house programs or indirectly through partners. MFI generally refers to independent microfinance institutions, and tends to be exclusive of alternative models for delivering microfinance that are emerging.

[3] In Bangladesh, for example, a number of MFPs – ASA, BRAC, Grameen and Proshika - each have in excess of one million clients.

[4] Financial sustainability for an MFP means that it is generating enough revenue from interest charges and fees to cover all direct and indirect costs, including operating expenses, provision for loan losses, and adjusted cost of capital. (The adjusted cost of capital refers to the cost of maintaining the value of the institution's equity relative to inflation and the cost of accessing commercial funding rather than concessional loans).

## The Microfinance Themes of "Outreach" and "Sustainability"

There are two current imperatives within the microfinance sector – "increasing outreach" and "improving sustainability". There is, however, a creative tension between these two imperatives. On the one hand, if "increasing outreach" is taken to mean "more clients from a similar demographic", then "outreach" and "sustainability" are effectively synonymous terms. Increasing client outreach provides economies of scale that in turn makes the MFP more efficient and therefore more sustainable, at least in immediate financial terms. It is a case of "more of the same", while continually seeking incremental improvements in operational efficiency.

On the other hand, if "increasing outreach" is taken to mean "targeting hard-to-reach clients" such as people living in remote areas, then "outreach" and "sustainability" are effectively competing terms. Reaching clients in remote areas is relatively expensive, which makes the MFP less efficient and therefore less sustainable. This is the real outreach challenge for MFPs because it requires new, as yet unproven business models and processes, including technological innovation.

## Microfinance and ICT Innovation

### *Back-Office Management Information Systems*

Many microfinance practitioners see ICT innovation as a key strategy to take microfinance to the next level in terms of outreach and sustainability. The most fundamental ICT application is the back-office MIS. A suitably sophisticated MIS is prerequisite for the MFP to monitor the quality, sustainability and efficiency of its loan portfolio, to monitor development impact, and to manage general administrative tasks. It is not possible for an MFP to upscale significantly without an MIS that can grow with the institution.

The larger MFPs have sophisticated back-office systems based on the same functionality provided by mainstream banking software. Indeed, some MFPs use off-the-shelf packages that might be found in any commercial bank. There are, however, a number of difficulties that arise when using these packages. Microfinance differs from traditional banking in a number of fundamental ways, with respect to products offered, clients served, the environment in which it operates, and the non-financial information that needs to be recorded and tracked. Many off-the-shelf software packages lack the functionality or flexibility to deal with these realities and requirements. This raises the need to either modify off-the-shelf software or develop in-house software, which assumes that the MFP has the internal capacity to develop and maintain software or the financial resources to outsource this work. More needs to be done to make standard and affordable MIS software accessible to smaller but expanding MFPs.

In the "Microfinance and ICT Innovation" discussion, these MISs are not considered the most exciting innovation – indeed, they are hardly even referred to as innovative. They are, nevertheless, the most critical and fundamental aspect of an MFP's hi-tech infrastructure. Further ICT innovation, of the type discussed below, is not possible without a sophisticated and appropriate back-office MIS. With this understanding, it is now possible to explore opportunities to apply ICTs closer to the client interface, to create significant new efficiencies and allow MFPs to serve the hard-to-reach clients in more remote areas.

### *Mobile Computing*

While the back-office MIS enables the MFP to monitor its loan portfolio, this functionality is undermined if the data analysed by the MIS is not up-to-date or contains errors. With dispersed branch offices, paper-based transaction records and manual data entry, there can be a data delay of days and even weeks, and the possibility of introducing errors during the data entry process is high.

A recent innovation that serves to overcome these issues is mobile computing systems – palmtop computers that loan officers take to the field so that financial transactions can be recorded directly into the MIS, without the need for intermediary data entry at the branch office. The data entered in the palmtop computers is typically uploaded to the MIS at the end of the day, either directly in the branch office or via a remote communications link. Furthermore, the roll-out of wireless broadband infrastructure will enable these systems to be "always online", resulting in true real-time data collection and monitoring of the loan portfolio at branch and institutional levels.

These mobile computing solutions also have significant implications with respect to data accuracy and integrity. Electronic data entry at field level, with on-the-spot, system-generated receipts for clients, significantly reduces data entry errors. Data accuracy is a fundamental requirement for any bank. An MFP will quickly lose credibility with its clients if errors are introduced during data entry, and "client confidence" is of paramount importance to any bank.

### *The Branch Office Franchise Model*

Serving new clients from remote locales is a key outreach challenge for MFPs. These locales include rural areas where the population density is low, the market is smaller and service provision is more expensive. MFPs find it difficult to serve these areas, especially when the overwhelming pressure is to reduce transaction costs and increase profit margins. One approach to meet this challenge is the "branch office franchise model", where an MFP links with third-party merchants in remote areas. This is an extension of the mobile computing solution discussed above. These branch office franchisees manage transactions on behalf of the bank, and they receive an agreed payment for service on a per-transaction basis. Fees might be shared by the client and MFP, on the basis that the transaction costs would otherwise be significantly higher for both parties if the service were delivered by more traditional models. Transaction data is transferred electronically to the bank either in real-time or, for example, at end-of-day.

The key qualities of franchisees are that they are long-term businesses, respected and trusted in their communities, with computer skills and connectivity. A recent player in this mix, notably in India, are the rural telecentre networks that are particularly suited to serving as retail outlets for a distributed microfinance network, because of their innovation-business orientation and their familiarity with IT systems and telecommunications services.

Given that these (non-regulated) branch office franchises collect deposits as well as loan repayments, the model requires some consideration by financial-sector regulators.

### *Card Services, EFTPOS [5] And ATMs*

There are many similarities between consumer credit cards and microcredit services. Like microfinance methodologies, credit cards were introduced to reduce the high costs associated with small transaction lending. Common characteristics include unsecured credit for unspecified purposes,[6] small transactions, and pre-defined credit limits. Other salient features of credit cards, which many microfinance clients would like their providers to duplicate, include on-demand borrowing, a re-draw facility, and repayment flexibility within pre-defined guidelines. We know that microfinance clients desire these features because they continue to utilize local moneylenders for these very services where they are not provided by their MFP.

Given the similarities between consumer credit cards and microcredit services, the concept of a "microcredit card" arises as a logical innovation. The introduction of card-based services also requires the roll-out of either

[5] EFTPOS - Electronic Fund Transfer at Point of Sale

EFTPOS functionality with third-party merchants (as per the branch office franchise model discussed above) and/or Automatic Teller Machines (ATMs). The former is probably the better solution for microfinance, because it facilitates immediate receipt for repayments and savings, which reduces the possibility of intermediary error or fraud. With ATM solutions, deposited repayments and savings are processed "back at the office" and receipted later, a process that is unlikely to secure the confidence of clients. In either solution, withdrawal of credit or savings is equally straightforward.

The delivery of card-based microfinance offers even more opportunities. MFPs can implement microfinance-tuned credit-scoring algorithms, allowing clients who have proven their creditworthiness over time through successful repeat business to have their borrowing limit automatically increased, be given access to additional products and services, and be granted greater borrowing and repayment flexibility.

MFPs can also consider smart card technology as part of their "microcredit card" solution. Smart cards have an embedded computer chip that can store client and transaction data, as well as process information.[7] Smart cards function as electronic passbooks, thereby reducing reliance on printed receipts. Because all relevant client data is stored on the card, MFPs can utilize EFTPOS systems and ATMs that do not need to be always on-line. This is a significant advantage in areas where telecommunications are unreliable and/or expensive. Finally, smart cards can be used in conjunction with biometric technologies (such as fingerprint scanners) to enhance the process of client identification, thereby enhancing privacy and data security.

***Internet Banking***

Internet banking provides clients with real-time information about their accounts, and the ability to transfer funds between their accounts. It is an empowering tool because it gives bank clients the flexibility to manage their financial resources deliberately, at their own leisure, and without having to visit a bank office during opening hours. In particular, it is a vital accompaniment to card-based services, allowing clients to keep track of numerous small electronic transactions.

From the bank perspective, Internet banking is an efficiency tool because it reduces the work of (human) tellers and therefore reduces labour costs. It is a relatively easy and inexpensive service to offer, and the incremental cost of having 1.000, 10.000, or 100.000 Internet banking clients is negligible.

The main constraint to MFPs implementing Internet banking is their clients' minimal access to the Internet. In some areas, this will be overcome somewhat with the roll-out of rural telecentre networks. It is also possible for MFPs to develop modified ATMs that provide this functionality.

## Remittances: Microfinance Outreach to International Labour Migrants

For many developing countries, remittances by international labour migrants are larger than both official development aid and foreign direct investment. A challenge for development-finance planners is to tap into this flow of capital in a way that is empowering for the individuals and families involved, and which results in long-term economic improvement for themselves and their communities. There is an opportunity for MFPs, through technological innovation, product design, awareness-raising and facilitation, to extend outreach to these migrant workers and their families at home.

[6] These days, MFPs rarely hold to the claim that their lending is purely for micro-enterprise development.

[7] Some smart cards have a memory chip only, others have memory and a microprocessor.

Specifically, the following interventions are required:

- Enabling policy and regulation that entices remitters to transfer their funds through formal channels rather than informal channels. This must include mechanisms for MFPs to be licensed as authorized recipients of international money transfers
- Technology solutions, international partnerships and associated business models that allow remitters to transfer their funds in a planned way, at regular intervals, in relatively small amounts, for reasonable cost, direct to the intended beneficiary (e.g. to a MFP-provided savings or loan account)
- A cohesive strategy by MFPs to educate labour migrants of the range of financial products and services that is available to them
- A cohesive strategy by development planners to highlight options for long-term investment, especially microenterprise investment.

In terms of technology solutions, MFPs need to develop their own electronic transfer capabilities to eliminate the cost of the "electronic middlemen" that currently provide this service. An example is Sri Lanka's Hatton National Bank, whose "HNB Easy Remittance" system has been implemented with currency dealers throughout the Middle East, enabling Sri Lankan migrant workers to remit funds directly to HNB accounts, including microfinance accounts, for a small percentage of the price offered by other funds transfer providers.

## Conclusion

All of the above examples of ICT innovation in microfinance are being trialled or implemented in various MFPs around the world. However, they are yet to become widespread. There is much to learn and more experimentation to take place. Nevertheless, the microfinance sector stands at a junction point, where its business models and processes are going to be challenged by these innovations.

There are many constraints to the roll-out of ICT-enabled banking systems. First, all of the usual digital divide issues apply: ICT regulatory regimes that hinder rather than enable innovation, non-existent, unreliable or high-cost ICT infrastructure, and the lack of human capacities needed to fully engage with the ICT applications. Second, there are challenges from the microfinance perspective as well: financial sector regulation that restricts innovation, technical capacities of MFPs to manage the design, roll-out and maintenance of ICT systems, and managerial capacities of MFPs to manage the necessary changes in business processes that will accompany the ICT innovations.

One observation that urges caution is that some ICT-enabled services, especially card-based services, tend to de-personalize and individualize the banking process and isolate the client from his/her peers. This conflicts with those group-based methodologies that are held up as the key reason for the high-repayment rates that are typical in the microfinance business. This concern cannot stop the transition to electronic services, but it is something that will need to be monitored closely.

Some people will say "it cannot be done in microfinance, electronic banking for the poor will not work". To this attitude, we can reply with two salient points. First, it *has* to work, because economies and enterprises that have embraced electronic banking and commerce will find it increasingly difficult to do business with those that have not, leaving the latter at a continuing disadvantage. Second, we do well to remember that more than 20 years ago when microfinance was in its infancy, there were many who said "the poor cannot repay, the poor will not repay, the poor cannot save". On all counts they have been proven completely wrong. Perhaps the same will be the case with e-microfinance.

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## About The Author


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## The Foundation For Development Cooperation

FDC's mission is to strengthen partnerships for sustainable development and poverty reduction through action research, policy dialogue, advocacy and capacity building. FDC's focus is on the Asia and Pacific region and its work is undertaken in collaboration with regional partners and networks. Since 1990, FDC has supported and promoted principles of sustainable microfinance, disseminated best practices and played a key role in the involvement of commercial and central banks in providing financial services for the poor.

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

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*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 MFIs, 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.*

## 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 called *MFIs*, 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 microfinance 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, as of yet no definitive standards have emerged for managing either of these important value chains. Management and information systems for MFIs are still in their infancy. Most MFIs still use basic software packages developed by local providers, and have much difficulty in upscaling their systems or procedures. Money transfers are commonly handled in slow and inefficient ways, in the best case by "piggy-backing" on the infrastructure of formal financial institutions. Most MFIs still rely on significant manual data collection, entry and other "brute force" efforts 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 can become a reasonable investment option for those banks seeking to diversify their portfolio, expand their outreach and cater to their social conscience (or meet government regulations).

Examples of mainstream banking companies working with MFIs to provide loan capital have flourished in recent years. Iin the past five years, Citigroup Foundation has made US$17 million in grants to 178 microfinance partners in 50 countries[1]. On a national scale, NABARD, the national bank for agriculture and rural development in India, as of 2003 had provided almost US$200 million worth of capital for village microfinance groups through its SHG-bank linkage program[2].

One of the most active private banks working in microfinance has been ICICI Bank, the second largest

[1] Citigroup Home Page, http://www.citigroup.com/citigroup/citizen/community/
[2] NABARD Home Page, http://www.nabard.org/oper/oper.htm

bank in India. ICICI has been a pioneer in implementing new microfinance outreach channels, partnering with MFIs and providing low-cost sources of commercial funds. In the last year, ICICI has completed two portfolio securitization deals with MFIs, with a total value of almost US$10 million.[3] ICICI has also supported several initiatives seeking to establish low-cost financial service delivery channels for rural areas, such as banking through Internet kiosks and smart-card 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 and larger numbers of clients and connect the various stakeholders in the industry. In this paper we will look at three major technical challenges facing MFIs 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 twelve month research study, including 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 Management Information Systems (MIS) 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 will also discuss some of our own efforts in these areas. This includes our work in the design of accessible user interfaces for uneducated rural clients and the Mahakalasm MIS toolkit – an open source toolkit for information management and processing by SHG Federations. We will conclude by presenting some plausible models for the future of rural microfinance service delivery, based upon currently observed trends and certain underlying principles for meeting the industry's goals of sustainability, efficiency and maximum outreach.

## Rural Microfinance Service Delivery: Challenges and Solutions

In our time spent studying and working with MFIs, 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 MFIs we have visited, regardless of size, location, lending methodology, philosophy, etc. Many other works addressing technology issues in microfinance fail to distinguish between these distinct problem cases, and confuse the issues and approaches in dealing with each. In this section we will discuss each of these challenges in depth, highlight current approaches towards solving them, and discuss those solutions which have so far seemed the most successful.

## Challenge #1: Collection Of Information From Remote Rural Clients

According to Mohammad Yunus, founder of the Grameen Bank, “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.”[4] 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.

[3] ICICI Social Initiatives Group Home Page, http://www.icicisocialinitiatives.org/microfinance/microfinance_content.asp?lvl=126&plvl=0

[4] Grameen Bank Home Page, http://www.grameen-info.org/bank/GBdifferent.htm

One can imagine the immense technical challenge this is. 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 a little queasy. “Bringing a bank” to 45,000 rural villages every week is not a simple thing to fathom. Much of this herculean task falls upon the shoulder of *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 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 MFI's business requires knowledge about prospective clients as well. Tools to research and evaluate new clients and credit applications are essential in growing a MFI's business wisely.

Perhaps even more importantly, thousands of transactions 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, delinquency and potential trouble spots. The institution has to be vigilant about its loan portfolio and actively follow up on delinquent loans to achieve the rates of return that are required to achieve sustainability and profitability.

There are several other factors which are very important for the efficiency and growth potential of a MFI. Two of these are in how quickly the loan officer can conduct daily client interactions, and the amount of time it takes to process a new application for credit. This defines 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 growing industry with a large untapped market, rapid and unpredictable growth can be an important thing for MFIs 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 do electronic documentation and/or evaluate credit applications in the field.

SKS Microfinance, an MFI working in the drought-prone regions of Andhra Pradesh, has been one of the fastest growing MFIs in India over the past several years. Having commenced operations in 1997, SKS already works with more than 40,000 clients[5]. 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 they have actively sought technology-based solutions that would allow them to scale more rapidly and reach more clients in a cost-effective manner.

As part of these efforts, SKS introduced a prototype data collection system using the popular Palm Pilot PDA devices and smart cards in May of 2001. 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 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. This initial pilot was supported through US$125,000 in grants and soft loans received from CGAP (the World Bank's apex body on microfinance), Digital Partners and Grameen Foundation USA (two US-based non-profits working on technology-based solutions for international development challenges).

Over the year long pilot period, SKS observed significant improvements in the accuracy of the records collected from the field and similar improvements in efficiency for their subsequent delivery to the central MIS[6]. However, the average reduction in village meeting times 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[7].

Compartamos, an MFI 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. Originally started as a pilot project of another large Mexican NGO in the early 1990s, Compartamos became an independent MFI in 1995, and since then has doubled its operations approximately every 2-3 years[8]. It currently reaches more than 150,000 clients located all over Mexico.

Compartamos is supported by the international Accion network, which specializes in supporting a style of microfinance called *village banking.* 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 in using hand-held technology 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. Organizations often use detailed algorithms and calculations to decide which clients are eligible for receiving new credit and under what terms.

[5]SKS Microfinance Home Page, http://www.sksindia.com/Milestones.htm
[6]CGAP IT Innovation Series, http://www.cgap.org/docs/IT_smart_card.html
[7]SKS MIS Management Team, Personal Communication
[8]MIX Market Home Page, http://www.mixmarket.org/en/demand/demand.show.profile.asp?ett=237

However, Compartamos, like SKS, has also discontinued its hand-held pilot project[9]. One 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 MFI 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[10].

This is notable, as offering a flexible savings product has long been one of the main challenges facing MFIs worldwide. Clients have long demanded access to flexible savings products, and in fact some observers view microcredit loans as one form of "after-the-fact" savings for clients. 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 MFIs can 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

[9]CGAP IT Innovation Series, http://www.cgap.org/docs/IT_pda.html
[10]SafeSave Home Page, http://www.safesave.org

cost-effective savings product. The result is that very few microfinance organizations have been able to offer safe, flexible savings to their clients, which in some cases is a service that clients need more than loans.

SafeSave, supported by a US$15,000 donor grant, is currently in the midst of a two-year experiment using Palm Pilots involving two branches with about 3000 clients[11]. Similar to SKS, SafeSave is using these relatively inexpensive PDAs (approximately US$100 each) to document transactions in the field and to automatically upload these transactions into the organization's central MIS. 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."[12] In an industry driven by scale and the slimmest of operating margins, it remains to be seen whether or not SafeSave will continue the pilot when it comes down to using their own hard-earned funds.

One of the few MFIs 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, currently operating in six states and serving over 150,000 poor clients. Together with its technology partners, Basix has invested a lot of time and resources in developing IT solutions supporting its operations. This includes an MIS solution (FAMIS – Financial Accounting and Management Information System), with an integrated mobile solution for the field, using high-end hand-held devices from Oregon Scientific[13]. Basix has even created an independent consulting arm which implements FAMIS at other MFIs.

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 US US$450,000[14].

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 US US$500,000 in developing its information technology infrastructure, including a US$350,000 assignment from the International Finance Corporation and more support from the Small Industries Development Bank of India[15]. Basix may now be reaping the rewards of this investment, but it is hard to imagine many MFIs 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 US$20,000 and US$80,000 on their mobile computing implementations, plus hardware costs, plus yearly maintenance costs ranging between US$3,000 and US$8,000. These solutions have been developed over time frames ranging from nine months to two years[16]. As noted above, 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-

[11] Mark Staehle, Technical Advisor, SafeSave, comments made in Virtual Conference on E-Banking, February 16-27 2004

[12] Ibid

[13] V. Chandra Rao, *Mobile Computing for Microfinance*, I4donline Magazine, January 2004, http://www.i4donline.net/issue/jan04/mobile_full.htm

[14] Ibid

[15] Janaki Turaga, Opportunities and challenges in India: Crafting the MF/IT Paradigm-The Indian Experience, I4donline Magazine, January 2004, http://www.i4donline.net/issue/jan04/opportunities_full.htm

[16] CGAP IT Innovation Series, http://www.cgap.org/docs/IT_pda.html

consuming process, and only those institutions that are willing to invest the time and money are going to reap any 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.

At the same time, 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 a bit less quickly than using electronic methods. In markets where labor costs are low, this is not nearly enough of an incentive to switch to prohibitively expensive solutions for marginal improvements in efficiency.

In discussions with leading microfinance technology advisers, it has emerged that the only situation where paper is not a sufficient tool for microfinance in the field is when calculating the results of credit-scoring algorithms for evaluating a clients suitability for a loan. As very few MFIs use such scoring methodologies, particularly those practicing solidarity group lending for which this technique is not applicable, it is clear that this is not a case of much value for meeting the broader needs of the industry.

The Grameen Bank has long emphasized the importance of standardized procedures and processes rather than technology-driven solutions. In discussions 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 accurate documentation. In his view experience with manual, paper-based MIS procedures helped rather than hindered loan officers' understanding of these standards. By performing these routine operations they are more familiar with the data that is collected in the field and how it is used within the institution.

## Designing Standard, Accessible Paper Documentation Formats For SHGS And SHG Networks In India

Working with Ekgaon Technologies and the Covenant Centre for Development in Madurai, India, we are currently working on developing standardized, accessible paper MIS formats for SHGs and SHG networks. SHG banking is a form of microfinance that has emerged and with government support become very popular in India. An SHG (self-help group) is a cooperative of 15-30 women, who communally save money in regular monthly or weekly increments. This pooled capital is then used to finance loans to group members or, in some cases, to provide loans to external parties (such as other groups) or to make community investments. In many ways SHGS are similar to “informal” cooperative banks, which have existed for quite a long time all around the world.

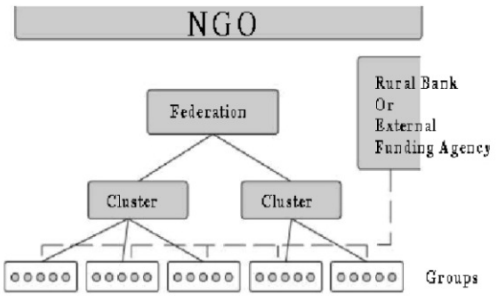


*Figure 1: Structure of SHG Networks*

In India, SHGs are most often formed and trained by non-governmental organizations (NGOs). These NGOs provide valuable assistance to SHGs, including maintaining their accounts, resolving disputes and helping them to link to external sources of capital. This external capital can be provided by local banks, which will typically lend to SHGs after they have reached a certain level of stability and self-sufficiency (typically six months).

This practice is supported by NABARD. NABARD will refinance a bank's loans to SHGs at an attractive interest rate, which together with SHGs typically good repayment rates make it an attractive investment opportunity for banks. More importantly, this is a way for banks to meet quotas imposed by the Reserve Bank of India that stipulate a certain amount of every bank's loans must go towards national “priority” areas, such as the rural sector.

In some cases groups of SHGs will be guided by NGOs to form larger super-structures, like clusters and federations. These “cooperatives of cooperatives” facilitate things like loans between groups, larger group investments, and other inter-group activities. In some cases federations can also access larger amounts of capital directly from financial institutions or donors.

These structures can become quite complex and powerful, which can make the job of managing and administering SHGs and SHG networks tedious. As SHGs mature they are supposed to become independent to the point where they can be managed internally by the group members themselves. As an article from PRADAN (one of the pioneers of the SHG movement) relates, “The approach that PRADAN has adopted requires that the groups become independent from PRADAN in a reasonable time frame so that the staff are free for their core task of livelihoods promotion."

However currently almost all SHGs are still heavily dependent on the NGOs which themselves rely on donor funds for their survival. It is our opinion that SHGs and SHG networks would benefit greatly from a set of standardized MIS formats and procedures which they could follow in their local language. This would reduce much “reinventing of the wheel” that may happen when NGOs train new SHGs in data recording and management. Currently each such NGO must develop its own set of forms for conducting these basic documentation tasks.

Village Banking and Grameen-based MFIs already benefit from such standards in their particular lending methodologies. Even for SHGs, standards do exist in certain states, but they are unnecessarily cumbersome and can vary from state to state. These formats are commonly based on traditional accounting documents, which are difficult to use and understand for SHG members.

We are attempting to develop a much simpler set of forms which can be used directly by SHG members, if necessary with the help of locally known villagers who are more literate. This will consist of a set of simple records, journals, ledgers and an operational manual, to codify documentation guidelines and guide members in the analysis of basic records. We are currently in the process of developing this MIS. After the initial trial run has been completed, it is planned that this paper MIS will be tested in at least 90 more SHG Federations spanning several states.

In this work we are applying some of the same principles we had obtained earlier while working on developing an accessible *computer* user interface for the same purpose[17]. It is interesting to note that as we have worked on this project many of our underlying assumptions have changed drastically, but the guiding principles we have discovered along the way have remained strikingly consistent. We will consider this topic again in the conclusion.

## Challenge #2: MISs At Institutional Level

Over the course of the last year I have had the opportunity to visit eight MFIs and observe their MIS implementations. Five of these MFIs were in India, while the other three were in Central America. They ranged in size from medium to small, with between 10,000 to 50,000 clients, and practiced various forms of microfinance lending methodologies.

[17] Parikh, Ghosh, Chavan, Syal and Arora, Design Studies for a Financial Management System for Micro-credit Groups in Rural India, http://www.cs.washington.edu/homes/tapan/papers/p0314-parikh.pdf

Some of the observations in India were collected while working as a consultant evaluating MIS implementations for organizations such as CGAP, Grameen Foundation USA and ekgaon technologies. The remaining observations were collected as an observer on field visits with the Grameen Technology Center's Microfinance Automation project[18].

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[19] software development packages. 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 and stored all of its data manually.

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

However, this platform does have significant limitations. The VB programming language does not support a modular separation of the user's view of the 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.

[18]Grameen Technology Center Home Page, http://tech.gfusa.org/automatn.shtml

[19]Microsoft Home Page, http://office.microsoft.com/home/office.aspx?assetid=FX01085791

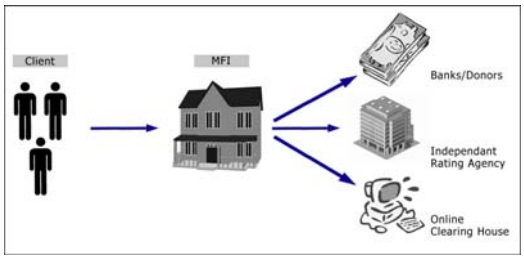


*Figure 2: Information channels in microfinance.*

Many MFIs have experienced difficulty expanding or adapting software based on this architecture. Either as they seek 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 MIS 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". MFIs are continually re-developing custom MIS applications with little potential for scaling or future adaptation. Largely 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 situations. This is a luxury that most MFIs frankly do not have the resources to support.

The case was 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. In return, the MFI was most often left no choice but to learn on their own, and adapt their processes more towards those supported in the software. Lack of technology capacity in many MFI leaves them very limited in their options for handling such 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 VB / 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 direct 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 very successful. MFIs are frankly 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 institutions 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 – such as picking through disparate sources to compile consolidated Excel reports. This is a grievous waste of time for already overburdened individuals who do not have much to waste. As a result, outside information recipients, whether they be donors, creditors or third-party evaluators, can never really be sure of how the figures were calculated and how accurate they are.

In an industry where information is such an important commodity, this should be a cause for significant concern. So far it seems that more international attention has gone towards the development of hand-held technologies for field data collection, which while an innovative experiment, is not in our opinion the main information challenge facing the industry. In the following section we will outline one approach towards solving this difficult problem.

## Mahakalasm MIS: MIS for SHG Networks

This project is assembling an open-source, easy to use MIS for SHGs and SHG Federations in India and abroad. The Mahakalasm MIS toolkit is also suitable for use by similar kinds of community-based MFIs. The toolkit consists of the following main components:

- Manuals and Formats - Documented procedures and paper data formats for collecting information and managing records.
- Modifications to SQL-Ledger - Customization of the open source SQL-Ledger accounting package for use by SHGs and SHG Federations.

- Portfolio Management System - A web-based portfolio management and reporting system for SHGs and Federations.

The pilot implementation of the Mahakalasm MIS toolkit is being done with four SHG Federations near Madurai, Tamil Nadu. These Federations are locally referred to as Mahakalasms, or large storage jugs. The pilot implementation was scheduled to begin in January 2005. The second phase of implementation is currently being planned for the CEFI network of SHG Federations, located across Southern India in seven states and with over 150,000 individual members. These community-based financial institutions require inexpensive, easy to manage information systems to grow and offer consistent value to their members. More details about each aspect of the project can be found below:

- **Manuals and Formats** The first step is to document the organizational procedures used in SHGs and SHG Federations and to specify standard data collection and reporting formats. We are currently working on the redesign of the paper record keeping formats used at the Mahakalasm Federation in Pulvoikarai, Tamil Nadu. We are also developing a local-language training and policy manual for use by the Mahakalasm. As part of this process, we are trying to simplify the existing formats by removing some of the gaps, inefficiencies and redundancies. As described earlier, we are specifically designing the formats to be easy to use, and potentially be at least partially understandable by uneducated or semi-literate group members.

- **Accounting System** Accounting is probably the most common and demanding data processing task for many MFIs.

  This is the first phase of the Mahakalasm Computerization project, automating the current ledger-based accounting system. Right now the Mahakalasm expends great effort and resources in producing even the most basic accounting reports. Computerizing the accounting system should make it much easier for the Mahakalasm to prepare financial reports and handle audits.

- **Portfolio Management System** For the second phase of the Mahakalasm Computerization project, we are developing a web-based porfolio management system for use by SHGs and SHG Federations. This part of the toolkit will require the most work, as there are not many open source products or libraries that would be helpful. Currently it is planned that the system will be implemented in PHP or Perl. As it is not feasible that individual SHGs maintain their own computerized records, they will continue to maintain their basic records manually. However, we are planning that the Mahakalasm will offer computerized record keeping and reporting services to individual groups for a monthly fee. For this purpose, the accounting and portfolio systems will be able to handle record-keeping at both the federation and group levels.

## Challenge #3: Conducting Financial Transactions In Remote Rural Areas

The one thing that we found as an almost universal challenge in MFIs was the collection and disbursement of money in the field. Historically, this has been done by most MFIs in a cash-centric, labour-intensive way.

In the most common model, most transactions are done 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 in the names of the

recipients. It is the responsibility of the loan recipient to go and cash the check at the nearest bank branch. In the case of India, there is a widespread regional rural bank (RRB) network that is supported by the central government. Many MFIs in India will establish relationships with these regional rural banks to make it easier for loan recipients to go and 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. Under these circumstances, loan officers may need to travel to villages regularly with large amounts of cash. Due to safety and security issues, MFIs generally do not do this and require clients to come to the branch office (usually in pairs, again for security reasons) to collect the loan.

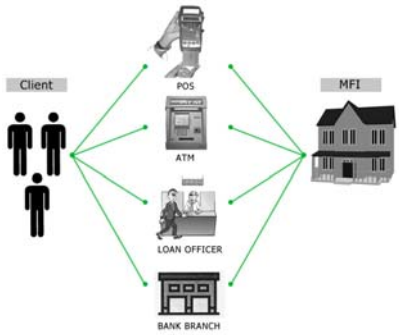


*Figure 3: Rural cash handling options for MFIs.*

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 quite easy for a potential thief to predict when a loan officer might be traveling through an area with significant amounts of cash. On 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 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 MFIs 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 potential fraud that would take weeks if not months to track down.

To meet these challenges, many MFIs are starting to lean more heavily on local bank branches for handling their cash tractions. 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 meeting as proof of their payments. The MFI then transfers these funds out of these “dummy” local accounts into their main institutional accounts. Out of the eight microfinance organizations we have visited in the last year, 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 MFIs to clients, regional rural banks and indirectly to the government that subsidizes them. In many countries and locations there are no extensive rural bank networks on which MFIs can rely. In these cases it is the client that spends the time and money travelling to bank branches and conduct transactions.

In India, these rural banks are essentially providing a free service to MFIs. The money is not left in their accounts for long enough to earn any appreciable interest, nor is there any transaction service fees. Due to the small value of microfinance transactions, any reasonable charge would be proportionately too small to probably make any business sense for the bank. Therefore, with no sound business case linking them, the relationship between MFIs and these regional rural banks can be very inconsistent. In many cases the MFI

must spend significant time lobbying the bank's local management before they 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, an MFI operating in eastern Uttar Pradesh. CASHPOR is collaborating with ICICI bank in a new model for microfinance[20]. 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 transaction 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 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, doing the main work 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 using it. This gives them a lot of leverage in aggressively pursuing new clients and expanding their operations. However, the regional rural bank still must handle the thankless task of processing the cash transactions in the field, for which they receive no financial 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 be an inordinately long process. In this case, the transfer between ICICI's consolidated account and CASHPOR's rural bank account can take up to seven days in either direction.

Bindu Ananth and Bastavee Barooah of ICICI Bank's Social Initiatives Group talked about the costs associated with slow cash transfers in a previous issue of i4d weekly[21]. While funds are in transit and therefore financially idle, someone must pay for the interest that should be accruing on that money. In fact this can be a major cost for MFIs and has been an issue at every MFI 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 this 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.” Rural transaction processing has been one of the areas of most intense technological investigation for MFIs. There can be many factors in the successful design of an electronic banking solution for remote rural areas. These include hardware costs, communication costs, geographic accessibility, power and connectivity requirements, government regulations and customer acceptance. Any successful solution must address all of these issues.

[20] Grameen Connections, http://www.gfusa.org/newsletter/summer03/RemovingBarrierstoGrowthinIndia.shtml

[21] Bindu Ananth and Bastavee Barooah, Leveraging technology for micro banking, http://www.i4donline.net/issue/jan04/leveraging_full.htm

To this end, 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, for the development of a low-cost ATM machine[22]. The current prototype carries a price tag of 30,000 Rupees, which is approximately US$700 USD. This is a quantum leap from the costs of a typical commercial ATM, which can range anywhere between US$15,000 to US$30,000 dollars. 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 MFI that is one of the widest reaching financial service providers in that country. Since early 2001, PRODEM has establish a dedicated ATM network across all of its branch offices and at many other standalone locations[23]. 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 US$18,000 per ATM, still significantly less than the prices charged by most 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 MFIs. Even these “low-cost” ATMs are still out of the financial reach of most MFIs.

Another more economical approach relies on “human-mediated” ATMs. In this case the client conducts transactions with a local human proxy (often 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 approach[24]. One project is led by Hewlett Packard and an association of several large MFI networks. They are seeking to develop a generic *Rural Transaction System*[25], suitable for conducting many kinds of transactions. This project is currently entering a trial deployment, and results of this pilot are expected by the end of the year.

POS devices have already 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 ranges between US$100 and US$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 believe 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 MFI. Therefore it might be better to install POS devices first in branch offices, so that local merchants can have an opportunity first hand to see the value of the device and the potential new business that can be generated.

For example, 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

[22] IIT Madras TENET Group, http://www.tenet.res.in/Press/atm_icici.html

[23] Digital Dividend PRODEM case study, http://www.digitaldividend.org/case/case_prodem.htm

[24] Microfinance Gateway, Experiments with Point of Sale Technologies Underway in Africa, http://www.microfinancegateway.org/content/article/detail/19469

[25] Microfinance Gateway, Uganda Remote Transaction System Pilot, http://www.microfinancegateway.org/content/article/detail/19145

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 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[26], and using these facilities to provide banking services is a natural extension of these efforts.

However, so far 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 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 the results of some of these initial trials, we should watch for continued development in this area.

## 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 there are several large international and national banks have already or are seriously considering entering microfinance as a potential commercial market. Several examples of this have already been discussed in this paper, and there is no doubt that there is a "buzz" around this topic in the industry. As long as microfinance clients can continue to prove their repayment performance, and new 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.

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 backbone of the MFI. Field staff carry out the key task of managing relationships with the clients. It is they who are truly "bankers to the poor", and it is based on their work that the economic development (and hence repayment performance) of the clients truly lies.

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

[26] SARI Project Home Page, http://edevelopment.media.mit.edu/SARI/

betterment of their clients. While a bank is certainly better equipped in terms of access to resources, capital and existing information systems, it is the MFIs and their understanding of the rural context that currently provides the 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 removed from their core strengths to be a reality 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 MFIs as grassroots partners that allow 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 MFIs are happy to partner with banks in order to access 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 these requirements effectively, and may even see it as a distraction from their core social agenda.

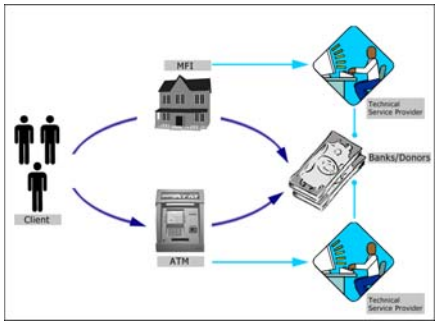


*Figure 4: Future scenarios in microfinance, and the role of technical service providers.*

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 by a partner bank, who might maintain a single consolidated department that looks after the MIS systems of several partner MFIs, or it could be done by 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 the technical capacity required to effectively provide microfinance services. Examples of this abound already – many of the largest MFIs in the world either started as or transitioned to become commercial for-profit entities focused on providing microfinance services. In this case they may choose to take on many of these technical challenges themselves. The social agenda would largely become secondary for these organizations, as it already has in many cases. This issue 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. For example, 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. MFIs would be the perfect

candidates for outsourcing such applications to an external service provider.

Several private companies and international network organizations have already started providing ratings and evaluations of MFIs. Grameen Capital, a new company in India, has taken on the role of consolidating existing microfinance portfolios and selling them to financial institutions in insecurities deals[27].

Another business opportunity lies in building and implementing low-cost rural transaction channels that can be used uniformly by banks and MFIs. 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.

## Conclusion

How ever 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 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.

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[27] Counts, Stahl, Hastings and Dunford, Capital Markets Initiatives and Social Empowerment, https://marriottschool.byu.edu/conferences/microenterprise/presentations/Counts%20Stahl.ppt

# Banking the Unbanked: Technology's Role in Delivering Accessible Financial Services to the Poor

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*The Microdevelopment Finance Team (MFT) carried out pilot projects in Uganda to determine the role technology could play in increasing the reach of microfinance. The team envisioned a "data transaction backbone" that would link microfinance clients to their financial institutions and beyond. The resultant technology was known as the Remote Transaction System (RTS). The conclusions drawn from the study (and similar initiatives conducted in other parts of the world) include: that business process change and the implementation of new technology should proceed in tandem; creative technology solutions are required to be tailored to the unique and often challenging needs in emerging markets and local contexts; and partnerships between MFIs and local companies assist in reducing infrastructure costs. Technologies such as the RTS can evolve and provide functionality that serves to build bridges between MFIs and the formal financial sector.*

## Introduction

The goals of attaining economic development in many more countries around the world is unlikely to be realized while 1.7 billion working adults make less than US$2 a day[1] and have little or no access to basic financial services. The history of financial systems in the United States has shown that providing citizens with access to capital and the ability to save are key underpinnings of economic growth. Yet between 70 - 80% of the world's population has no access to even the most basic financial services.

Over the last 30 years, the microfinance industry has proven that the extreme poor are bankable. Not only do they repay loans, but they also do so with very low defaults and relatively high interest rates. MFIs can, and have, become commercially viable enterprises. Yet the microfinance industry as a whole has not been able to grow fast enough to meet demand. At the same time, banks and entrepreneurs in developing countries are beginning to realize that there is a viable market for financial products among the vast unbanked populations of the world.

How can microfinance have macro impact in the world such that billions of today's urban and rural poor gain access to financial services? This is the question that a consortium of public and private sector partners, convened by the Hewlett-Packard Company, asked themselves three years ago. With financial support from the United States Agency for International Development (USAID) and Hewlett Packard, this consortium engaged in three pilot projects in Uganda to determine the role technology could play in increasing the reach of microfinance.

The outcome of the consortium's work was unexpected. Results came from a combination of multi-sector inquiry, research into other global initiatives, and findings on the ground in Uganda. The financial analysis that was conducted at the conclusion of the pilots pointed to a new direction that microfinance could take in order to achieve a dramatic increase in scale, the kind of scale that will allow the industry to move from the 120 million people that are currently being served to the 1.7 billion that could be served.

[1] McKinsey & Company, 2005

The three overarching lessons of the pilots were:

1. Technology combined with business process change brings the greatest return
2. Emerging markets require innovative, appropriate technologies that are designed for scale
3. The costs associated with building the infrastructure to support this enabling technology is too high for MFIs to go it alone

A growing number of practitioners and thought leaders in the microfinance industry are beginning to coalesce around concepts that are supported by these lessons - namely, that reaching significant scale in the microfinance industry is likely to require changing existing business operations and procedures, standardizing the collection and management of customer data, and sharing the cost of underlying infrastructures.

How could the reach of financial services to the world's poor be dramatically improved? What would it take to reduce transaction costs and help MFIs achieve greater business viability? What role, if any, might technology play? These were the questions that a diverse group of professionals calling themselves the Microdevelopment Finance Team (MFT) rallied to in July 2002.

Convened by the Hewlett-Packard Company (HP), this consortium of private and public sector partners[2] pondered how to champion a breakthrough in the effectiveness, relevance, and scale of microfinance to bring financial services to a greater percentage of the world's poor. Was it possible, they asked, to grow today's 120 million customer base of microfinance recipients tenfold or more? Could microfinance reach the 1.7 billion working adults who live on less than US$2 a day? What would it take to build the retail capacity and IT infrastructure that could serve that many customers?

Today, nearly three years after the MFT first met, a roadmap is unfolding that gives some needed direction toward reaching this kind of world changing scale in the delivery of financial services to the rural and urban poor. It is a map that reflects a number of pilot projects that have been undertaken around the world, the thought leadership of those working in microfinance, and the early experiences of the credit card industry in the United States, which helped revolutionize the delivery of financial services in industrialized countries. It is an answer that looks to the role that technology can play in championing scale in microfinance.

## Defining the Problem, Identifying a Potential Solution

When they first started their weekly conference calls in August 2002, the members of the MFT began by analyzing the state of the microfinance industry. What, they wondered, were the obstacles keeping the industry from achieving greater scale? When the team had a working definition of the problem components, they vetted their thinking with a wider audience of industry leaders. Together the team and its partners coalesced around the following obstacles to scale:

- An over-dependence on donor funds for both wholesale finance and operating costs, and the need for more sustainable, commercial sources of finance (such as local banks and the capital markets)
- The absence of consistent, sector-wide operating standards and business practices that are sustainable enough to stand up to external scrutiny by potential commercial investors and partners
- Fragmentation within the sector, and a lack of strong relationships with organizations outside the sector

[2] The Microdevelopment Finance Team (MFT) included individuals from Accion International, Bizcredit, FINCA International, Grameen Technology Center, Freedom from Hunger, Global eChange, PRIDE AFRICA, and Hewlett-Packard Company.

- Technical challenges and high transaction costs that make it too expensive to reach, in a sustainable manner, poor people in urban, peri-urban or rural areas who are not yet served by microfinance
- The need for flexibility to offer diverse financial services that meet local needs and priorities.

After much research and discussion, the MFT decided that technology could help alleviate some of these problems by providing a secure, low-cost, and reliable means of capturing transaction data and then transferring that data in a consistent, standardized manner to MFIs. Such a system could, they reasoned, improve operational efficiencies, decrease transaction costs, and enable sustainable outreach to underserved populations. The team also believed that if more reliable data could then be shared, in a standardized way, with other financial providers, issues related to capital investments, fragmentation, and the potential for more diverse portfolios could also be addressed, in part.

In essence, the team envisioned a "data transaction backbone" that would link microfinance clients to their financial institutions - and beyond. Since efficient, reliable data capture - even in remote and rural areas - was both the most critical, and the most challenging, element in the backbone, the team decided to build this first module. The resultant technology was known as the Remote Transaction System or RTS.

## Technology Development and Deployment in Uganda

The RTS was designed to process loan payments, savings deposits, withdrawals and transfers. It is based on a combination of smart cards, point-of-sale (PoS) terminals, a transaction server and connectors that send data directly to the MFIs' accounting and general ledger systems. Clients are given smart cards that contain their savings and loan account balances. When ready to make a payment, the client inserts her smart card into PoS terminal, which captures the transaction data, updates account balances on the smart card, and prints a receipt. Cash is exchanged between the client and the person responsible for the PoS terminal. Later in the day, all transactions saved on the PoS terminal are uploaded via the cellular network to the MFI's accounting systems where the transactions are reconciled.[3]

Once the MFT committed to building the RTS, they needed to select a country where they could test the solution. The group settled on Uganda because it had many of the essential ingredients for scale – a large number of micro-entrepreneurs, a friendly legal and regulatory environment, and several providers of microfinance with long and successful track records. Uganda also posed many of the infrastructure challenges that confront any provider of technology services in the developing economies, obstacles such as frequent power outages, unreliable telecommunication services, limited technical support, and high levels of illiteracy.

Three Ugandan MFIs agreed to participate in the pilot. Two of the institutions provide loans through a group lending or "village banking" methodology. The third MFI offers loans on an individual basis. The RTS was used differently in each institution, thereby testing three distinct business models. At the conclusion of the pilot, a detailed financial analysis was run on all three models. Two of the models showed a positive value for the MFIs.

## Three Overarching Conclusions

Detailed results from the pilot study can be found in a number of articles and technical documents on the web and will not be discussed in detail here.[4] What is more significant for the purposes of this paper are the meta-

[3] Complete details on the RTS technology can be found on the web. Refer to www.sevaksolutions.org for operational guides, technical documentation and other material about the RTS. Executable and source code are available at rts.dev.java.net.
[4] Refer to www.sevaksolutions.org for a case study and the complete financial analysis of all three models tested in Uganda.

lessons that have arisen from a combination of results from the pilot in Uganda, similar initiatives conducted in other parts of the world, and analysis of both the microfinance and finance industries. Together these conclusions pushed the team to think in new ways.

### *1. Technology combined with business process change brings the greatest return*

One of the powerful lessons that emerged from the pilot projects is that overlaying a new technology solution on existing business processes, without first rethinking those procedures, can increase, rather than diminish, the cost and complexity of doing business. Information technology provides the opportunity to update and innovate business processes. Through such innovation, technology can become a lever in creating the potential for an industry to achieve dramatic increases in scale.

The value that technology delivers when it is used as a catalyst for change and an enabler of new business models has been seen repeatedly. Within the financial sector there is a striking example of this principle. When credit cards were first introduced in the United States, merchants called an 800 number to verify funds before accepting a credit card payment - a process that could take 5 minutes or more. It is little wonder that this innovation did not take off. It was only when technology reduced the card authentication and authorization processes to less than a minute that credit cards became a widespread phenomenon. Additionally, credit card usage began to soar, the business models for financial services began to change. The technology enabled dramatic scale, data mining, and improved the industry's ability to manage risk. In essence, the business models and the underlying technology evolved together to create what has become more than a US$2 trillion per year industry.

The striking differences between the return on investment (ROI) that were calculated for each of the three business models in the pilot also support the conclusion that business process change and the implementation of new technology should proceed in tandem. When this was not done, the quantitative and qualitative benefits of the RTS were severely compromised. One of the pilot institutions used to automate – and alter – only one portion of its data acquisition process. Clients were completely unaffected by the introduction of the RTS and their group meetings proceeded in exactly the same way that they had before. The scale of transactions captured by the RTS device was not sufficient, to justify replacing manual data entry with electronic data capture. Financial analysis of this approach showed that the introduction of the RTS generated no return to customers, limited value for internal staff, and an actual cost increase for the implementing MFI.

Part way through the pilot, a second MFI realized that if it did not re-engineer its business processes than the RTS would increase - not reduce - its operating expenses. The technology would also make group meetings much longer. On the other hand, if the institution did re-engineer some key business processes, then the RTS would provide significant value to all members of the value chain – the clients, staff, and the MFI itself. This institution had been reconciling its accounts on a monthly basis. With the RTS, the management could have daily updates on activities in the field, and they could track their loan portfolios on an individual client basis. Previously the institution had only been tracking loans on a group basis, and had virtually no visibility to client savings.

Based on this information, this institution made an attempt to proceed with process change. A consultant was hired to assist them. Subsequent financial analysis, which included expenses only, showed that there would be a cost improvement with the RTS over manual data capture. The pilot did not proceed long enough to determine what the qualitative benefits would be to the institution of improved business processes such as collection of individual data, more efficient group meetings, and access to more timely information. At the

conclusion of the pilot, this institution decided that it did not have the internal will to shift to tracking loans on an individual basis. As a result, the institution stopped using the RTS technology and reverted to its prior practices.

The third MFI, which engineered a new business approach to leverage the RTS, demonstrated the greatest return for all constituents - customers, agents, and the MFI. In this model, PoS terminals were given to merchants, such as gas station franchisees. These merchants thus became "agents" of the MFI. Clients that visited a local agent did not have to travel as far to make loan payments or deposit money. The client transacted, and exchanged cash, directly with the local agent, who acted as a virtual extension of the MFI.

Although it was expected that clients would benefit from this model due to the increased flexibility and reduced costs associated with banking, one surprising result was the finding that clients are actually the greatest beneficiaries of this model. Experience and surveys consistently report that women are very likely to have their earnings taken from them by family members at the end of the day, or they find that their funds are spent in unplanned ways. The ability to easily stop at a virtual bank on a frequent basis has the potential to dramatically increase the amount of savings. If the clients avail themselves of this opportunity, it would have dramatic impacts on their financial stability and on the funds that the MFI has to make additional loans.

Since the agents receive a fee for providing a transaction service, they are also beneficiaries of this model. The analysis indicates that an agent in Uganda can have an attractive side business with between 400 – 500 regular clients that transact twice a month. And the MFI shows a positive ROI on their investment after the solution has been rolled out to more than 20,000 clients. Analysis indicates that extending the reach of microfinance into rural areas through these virtual agents will be much less expensive than the current branch model.

Only the agent model, which pushed beyond existing business practices, showed a positive return for all participants.

### *2. Emerging markets require innovative, appropriate technologies that are designed for scale*

Emerging markets require creative technology solutions that are tailored to their unique, and often challenging, needs – environments where telephone connectivity is erratic, electricity sources unreliable, technical support limited or non-existent, and much of the customer base illiterate. Innovation should find a balance between the best that technology has to offer and the constraints of the local context. It also needs to find a balance between simply adhering to existing business practices and driving toward business model innovation, as was discussed earlier. Taken together these conflicting forces provide a serious challenge, and must be kept front-of-mind during the entire design, implementation, and redesign processes.

One lesson that continually surfaced in the Uganda pilots was the importance of making smart decisions about distinguishing between technology solutions that were "appropriate" and state of the art technology solutions that were of little or limited practical use. While technology innovation is necessary, it is equally important to innovate solutions that are informed by the users' local environment. It is far better to provide a solution that can be used rather than one that is optimised for flexibility and always-online infrastructures, the criteria often used for mature market products. The total cost of the solution and the capabilities of the local markets must be part of any design criteria. The team that developed the RTS thought they understood these issues as they began to develop their solution, which was designed and developed specifically for conditions in Uganda.

Since most MFIs cannot afford expensive solutions, the RTS was architected for low cost. It must be remembered that the total cost of a solution includes all the hardware to run the solution, the technical support team required to maintain the solution, and the cost of all required infrastructure elements. All of these costs were considered in the RTS design. That is why the transaction server runs on a standard PC and requires limited technical support. At the same time that the solution was designed for the Uganda context, the development team also ensured that the software adhered to technology and financial industry standards so that it could scale and eventually help MFIs share data with other financial service providers or capital markets. The RTS traded end-user flexibility for reliability, speed, and minimal training requirements, all of which are more important in the Ugandan context. Thus the RTS is a true blend of the core elements that would be expected in any enterprise software solution, with alterations required to maximize the effectiveness of the solution in less robust environments.

With all of these considerations integrated into the design of the RTS, the team expected their solution to work well when it was introduced into the three pilot institutions. They were wrong. They did not understand the depth of their mature market bias or their lack of awareness about how things really work in Uganda. The information the team had received during their assessment visits did not match the realities that were uncovered as they began to test their solution at the local level. The management of the MFIs were often just as surprised by unfolding events as the RTS team. As a result, several disconnects occurred between what the RTS developers and management of the pilot MFIs initially expected the RTS to achieve versus what the pilot institutions actually were able to use.

Uganda, like many countries in the developing world, is experiencing rapid growth of cellular and wireless telephone networks. As a result, the RTS developers originally believed that there was sufficient cellular connectivity to allow an always-online solution that would transmit data to and from the field. When the RTS was first implemented the developers learned that, in Uganda, voice traffic takes priority over data traffic. Thus they found that although the Ugandan cellular network had a large footprint over the country, it could be very unreliable. To respond to these concerns, the RTS developers engineered an offline mode for the RTS as well. This change sped up the collection of data and lowered the effective transaction costs of the calls, alterations that dramatically improved the financial sustainability of the solution. Although the final solution was an improvement in many ways, the realities that drove the change were unexpected, and they added a tremendous element of redesign.

Prior to designing the RTS solution, the RTS team and microfinance management and staff had dissected each institution's operational procedures in excruciating detail. All the elements of the group payment process were discussed and documented. Resultant flow charts were transformed into production specifications, and ultimately, product design. It was not until the RTS was in the field that a number of inconsistencies between what the team had been told and what was actually occurring emerged. In one case, a payment that was collected during each group meeting was not included in the design criteria because the MFI didn't track it on their books. The group did track this, but without a way to account for those collections electronically, both the old processes and the new electronic processes would have to co-exist, a solution that would add complexity rather than reduce it. To overcome this obstacle, a combination of technical and business re-engineering was required.

Initially the goal of the RTS developers was to enable the pilot institutions to conduct "real time reconciliations," which means updating the accounts of these institutions as soon as financial transactions occur. As mentioned earlier, the business practices of the

cellular provider made this impractical, so the RTS was switched to an offline mode that updated the MFIs' MIS once a day. Even this frequency was too much for one of the MFIs to handle at first and its accounting staff requested that all the transactions be held on the RTS server until the end of the month when they would be ready to reconcile their accounts. Belatedly, as staff and management of the pilot institution realized that the capability of the RTS exceeded their existing practices, they were confronted with a dilemma. Would they change their business practices and start more frequent reconciliations to take full advantage of the benefits of the RTS or would they change the RTS, thereby eliminating many of the gains the technology offered?

These examples demonstrate the importance of finding a balance between product innovation, local realities, and business process change.

### *3. The cost associated with building the infrastructure to support this enabling technology is too high for MFIs to go it alone*

The highest capital costs of implementing the RTS solution are to be found in the PoS terminals (US$700 each) and smart cards (US$3.00 to US$5.00 each). During the Uganda pilot, blank cards were procured in India for approximately US$1.15 per card. These cards were then shipped to Uganda where they were printed locally. Printing costs ran as high as US$4.00 per card. To minimize the cost of printing, a local IT company was encouraged to provide card printing services. Through this partnership, the total card cost was reduced to less than US$3.00 per card. If the local company could print even greater quantities of cards this price would drop even more. Further, if the cards could be purchased consistently in batches of 10,000, the total price could drop below US$2.00 per card. These differences have a tremendous impact on the point at which the total solution returns a positive ROI for participating MFIs. The same dynamic exists with the PoS devices, which can cost less than US$500 when purchased at volume.

The local IT company that started providing card printing and procurement services was also empowered to handle server management and technical support for the participating microfinance partners. If three or more MFIs utilized this application service provider (ASP) to manage the technical support and card related aspects of their RTS deployment, a sustainable, self-perpetuating model would be established in Uganda. Each of the participating MFIs pay service fees that enabled them to realize a benefit from the RTS. These fees would be a fraction of the cost that the institution would incur if it had to build these capacities internally. The ASP would then have enough business volume to not only sustain its RTS-related operations, but to grow its RTS business in Uganda and the surrounding region. However, if only one institution in Uganda participates, then the sustainability model is no longer supported until that institution has a very high volume of smart cards in circulation.

In Uganda, the model that showed the greatest potential and return was the agent model in which merchants were designated as virtual bankers. The acquisition, training and support of agents represents a significant cost centre, particularly as the agent network grows. However, the model becomes more attractive to clients when there are more points of access at which they can perform financial transactions. This puts a MFI in a difficult position because it is to their benefit to build the network, but as the network grows their cost savings declines. In industrialized countries, this Catch-22 was overcome by banks recognizing that it was in their interest to share the costs of these infrastructure elements. Today, credit card clients in most countries can use their cards in any bank’s ATM or merchant machines. The same type of cooperation is probably required at the microfinance level, if institutions want to build sustainable ways to extend their points of presence in remote and rural areas.

Although history and economics suggest that

collaboration is critical to deploy the type of solution piloted in Uganda in a sustainable manner, cooperation is often resisted. The MFIs and local banks fear that their competitive advantage will be lost. This attitude was present in Uganda at the start of the pilot. The RTS was designed for cost reduction and thus it was anticipated that the participating MFIs would share one RTS server, connect their back-end systems through one generic connector, and adapt their business process to a common PoS interface. This approach would dramatically reduce costs associated with the design, deployment, enhancement and maintenance of the solution by more than a factor of three. However, when this approach was discussed with the participating MFIs, they all baulked. Each of the institutions wanted the RTS designed to meet their individual, and unique, business and MIS requirements. There was insufficient time or proof to convince them otherwise. The RTS team capitulated and created three distinct RTS servers, three separate connectors, and two PoS interfaces, which significantly increased the complexity and cost of the work in Uganda. The results of the pilot now clearly demonstrate that the original objective of a standardized core solution will be a requirement if the microfinance industry is to reach scale through this type of technology innovation. Creating separate solutions for each institution is neither sustainable nor is it scalable.

## Shared Infrastructure: A Requirement for Scale

The conclusions of the pilot have led several of the participants to realize that the possibility and opportunity for integrating technologies that will help microfinance achieve scale will only be sustainable when there is a large enough volume of participants in the system. Only through shared infrastructures and common standards can the costs of providing financial assistance to a dramatically larger client base be realized. Such sharing is required to increase the number, and reduce the costs, of access points through which clients can obtain financial services. It is also necessary if MFIs are going to be able to obtain and report the consistent, high-integrity data that will be required by capital investors or credit reference bureaus. The advent and growth of VISA is a prime example of the level of collaboration and technical sophistication that is required to achieve dramatic scale and commercial value for the entire value chain.

According to a recent survey conducted by ACCION International, for many microfinance players, like those participating in the pilot project, technology is viewed primarily as a means to control costs and increase efficiency. Whether these same MFIs also see technology as a means to achieve significant scale is less obvious, particularly if reaching that scale requires changing existing business operations and procedures, standardizing the collection of customer data, building networks of non-exclusive external agents, and sharing technology infrastructures. What the pilot project suggests, however, is that without steps like these, it is unlikely that small, customized investments in technology will achieve greater scale of the microfinance industry.

Self-contained organizations that are not interested in sharing information, standards or solutions don not, and, more importantly, can not scale. Those very walls that they have built, literally and metaphorically, around their business operations are unlikely to allow for the evolution of a fluid financial system that expands across and interlinks a multitude of players. While very few MFIs have been able to reach one million customers, the likelihood of true scale, that is scale that reaches hundreds of millions, or billions, of customers is unachievable while those walls still stand separating MFI from MFI.

Even in the developed world, the financial sector only reached significant scale and outreach when its financial actors agreed to coalesce around a number of shared standards that allow information to be passed uniformly

from one system to another. A primary example of this is seen in the evolution of the financial services industry in the United States. In the 1950s, the US consumer finance market in many ways resembled the microfinance industry of today. Average loan sizes were around US$300, repayment rates ran as high as 96%, credit decisions and processing involved significant person-to-person interaction, market penetration was rather shallow, and transaction costs were high[5].

So what happened to spur the dramatic growth in scale of financial services in the United States? The simple answer is a combination of new customer-focused products, new business models, and new enabling technologies. Term loans were replaced with credit lines that gave customers more power to decide why, when and how much to borrow. Face-to-face credit decisions gave way to massive credit card "drops". Banks developed strategies for managing and assessing the risks of these more "impersonal" credit decisions. Business models changed to allow cooperation and competition to co-exist as financial actors built shared infrastructures to reach a growing customer base.[6] Banks shared the costs of those infrastructure elements, including technology investments that were too expensive for any single player, yet continued to compete on differentiated services. This breaking down of walls between the banks in turn permitted shared technologies to be built that could enable a scaling up of the industry while also improving the services delivered to a rapidly growing customer base.[7]

In many ways, today's microfinance industry seems eerily reminiscent of the early stages of the credit card market in the United States when each bank was attempting to issue its own cards, develop its own exclusive network of internal and external agents, and invest in its own technologies to serve this new market. Like those banks of yesteryear, it is not unusual to see today's microfinance actors resist collaboration or sharing of systems, even when the cost savings of doing so are likely to be significant. In the pilot projects this was manifested in the participating institutions' resistance to sharing RTS servers, demand for customized connectors to link to their individual MIS, desire for uniquely designed and printed smart cards, and apparent disinterest in developing a network of shared external agents within the Ugandan microfinance community.

To some extent this preference found in the microfinance industry for customized, rather than standardized, solutions can be directly traced to the donors' doorsteps. A possible unintended consequence of some donors' strategy of funding "microfinance champions" and "innovation leaders" has been to foster a mindset among MFIs to go their own way, to value customized solutions over standardized solutions. Yet, the need for standardization continues to surface in this industry – be it to standardize financial and accounting practices, standardize social impact measurements, or, as here, to standardize business processes and operations for capturing individual customer data.

As has been noted by others, individual rural financial projects should be pursued with a financial systems perspective in mind. This implies that horizontal and vertical integration needs to be fostered within a decentralized, rural financial system.[8] This kind of up, down, and sideways integration requires not only standardization, including technology standardization, but more importantly building cross-sector relationships

[5] Nocera, Joseph. *A Piece of the Action*. New York: Simon & Schuster, 1994.

[6] Initially, banks issued their own credit cards for use within exclusive merchant agent networks. This exclusive strategy, however, dampened any chance to get to scale as it was proving unsustainable for the issuing banks. Bank of America finally broke this logjam when, under the leadership of Dee Hock, it developed the VISA model – a shared network owned now by more than 20,000 member banks from around the world. Within the VISA model, member banks agreed to establish a common architecture with standards adhered to by all members that would permit shared technologies to be developed that could settle financial transactions among a large number of merchants and banks.

[7] When credit cards first were issued, it was not unusual for bank authorizations to take as long as five minutes. Now, with advances in technology, most credit card authorizations in the United States rarely exceed more than seven seconds.

[8] Zeller, Manfred, Paving The Way Forward For Rural Finance: An International Conference On Best Practices, June 2003, "Models of Rural Finance Institutions, p. 29.

under which the system will operate. In short, it means building an ecosystem, much like the ecosystem seen in the natural sciences, where a web of interconnecting relationships exist. Implementing this vision, by definition, is complex and costly. That is why industry and sector solutions, at least at the national level, are necessary, rather than institution-by-institution solutions.

For those who have a stake in the growth of the microfinance industry, it is time to start developing incentives that encourage integration and sharing within the microfinance industry. There is much room to direct support into research and development of innovative technology solutions that encourage cooperation and collaboration, rather than customisation, among industry participants. Other investments worthy of donor support are shared infrastructures that decrease per unit costs for all participants, start-up capital for entrepreneurial businesses that are willing to provide technology services, and grants for those MFIs that are interested in participating in such ventures.

There is also a growing need to identify and then remove those legal and regulatory roadblocks that impede the expansion of telecommunication services into rural areas, frustrate the capture of microfinance transactional information (including the credit histories of microentrepreneurs), or limit the sharing of that financial information with central switches, credit reference bureaus, and bank regulatory authorities.

With this kind of reinforcing action, scaleable infrastructures can be built that link microentrepreneurs to internal and external agents, agents to microfinance providers, and microfinance providers to banks, credit bureaus, regulators, and, possibly even, to new multinational sources of credit. The RTS, or technologies like it, can evolve to provide functionality that serves to build bridges between MFIs and the formal financial sector.

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# Management Information Systems (MIS) for Microfinance

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*ICT can be a strategic tool in making Microfinance Institutions (MFIs) more efficient and effective. MFIs can reach more people in a more economic way by implementing the right Management Information System (MIS). While a few MFIs are making good use of technology, the majority are facing difficulties in getting the right solution. Reasons for this include:*

- *Insufficient organizational and human capacity*
- *Unavailability of suitable MIS applications for microfinance*
- *Diversity in business processes and frequent changes in procedures*
- *Risk of failure of the MIS*
- *Diversity of geography and language*
- *Unavailability of vendors and their capacity to implement and support IT solutions*
- *High cost of IT solutions for MFIs*
- *Lack of commitment of management and key decision-makers within an MFI*
- *Lack of awareness about the importance of IT*

*The back-office MIS is the backbone of any Information System solution and yet it has not received much attention. MFIs, whether large or small, need to have a strong back-office MIS before attempting to deploy any advanced front-end applications or delivery channels. These would be worthless without having a strong and flexible back-office MIS in place.*

## Introduction

Microfinance is considered to be an effective tool in alleviating poverty by increasing income of poor households and reducing their vulnerabilities. Today, when the majority of the world's population is living below subsistence level, more than 3,000 organizations are providing microfinance services to millions of the world's poor. Yet most of the poor still have little or no access to financial services. Microfinance institutions (MFIs) have reached a mere 70 million out of 2 billion poor people. The task of reaching such a big number is a major challenge.

With a population of around 150 million people, Pakistan has big potential for microfinance. 70% of the population lives in rural areas. Despite achieving a growth rate of 6-7% in recent years, poverty has increased by 2%, showing low penetration of economic benefit to the lower income sector. Unemployment rate stands over 8% and per capita income is US$652. The financial sector of the country comprises some 35 scheduled banks. These banks have an outstanding portfolio of US$20.7 billion against 3.2 million accounts and they hold deposits worth US$33.3 billion in 28.5 million deposit accounts. More than 50% of the deposits and portfolio are concentrated in three main banks with large branch networks.

The microfinance target market is over 7 million households. Major players within the microfinance sector include:

- Khushhali Bank
- Khashf Foundation
- Rural Support Programms (RSPs)
- Bank of Khyber
- The First MicroFinanceBank Ltd
- Orangi Pilot Project (OPP)
- Sindh Agricultural & Forestry Workers' Cooperative Organization
- Sungi Development Foundation
- Taraqee Foundation (TF)
- Thardeep Rural Development Programme (TRDP)
- The Bank of Khyber (BOK)
- ORIX Leasing Pvt. Ltd
- Network Microfinance Bank and
- Rozgar Microfinance Bank

The First MicroFinanceBank Ltd (FMFB) is the first private-sector, regulated MFI in Pakistan, with operations all over the country in rural and urban areas. FMFB was formed as a result of the transformation of the microfinance program of the Aga Khan Rural Support Programme (AKRSP), which has been running an integrated rural development programme in the remote and isolated north of Pakistan for the past 20 years. FMFB has transformed its technology solution from a very basic level to one of the most advanced within its peer groups. The Microfinance program at AKRSP started its operations with a manual system, then semi-automated and finally a full-fledged MIS for loans. The transformation from NGO to a microfinance bank posed a big challenge to its MIS solution as the existing MIS did not have any functionality related to deposits, remittances and insurance that the bank envisaged to offer. The challenge was addressed through the following strategy:

- Establishment of a strong IT department
- Short-term solution that involved integration of an off-the-shelf application with its existing portfolio management system.
- Long-term plan to build an enterprise MIS with the functionality to deliver all banking and microfinance services, and flexible enough to meet the current and future technology requirements of the bank.

The management of FMFB had demonstrated their understanding and commitment in making IT one of its strategic objectives and to opt for best practices in MIS. FMFB has been able to implement an advanced MIS that has already started to make positive differences to its business. As a result of its strong and flexible MIS, FMFB has been able to introduce a wide range of products and services, including loans, deposits, remittances and insurance. The system is used to obtain maximum information to support timely decisions.

## Difficulties in Adopting MIS

A number of MIS solutions are emerging. Currently, there are 56 MIS applications listed on the CGAP website, although more are being used by various organizations that are not publicized. Despite the advances in MIS, practical experience shows that the acquisition of a suitable MIS is not simple. Many MFIs are struggling with their MIS. Some of the reasons for these difficulties are:

- Microfinance operations are unique and complex, compared to commercial, retail banking .
- The Microfinance sector is still evolving and lacks standardization in its procedures, methodologies, customer characteristics, type of transactions and reporting.
- There is no of-the-shelf software available that can address the requirements of every MFI.
- Those MIS that are available are complex and costly for adoption by MFIs.
- MFIs lack human and organizational capacity to develop or select an appropriate MIS.
- MFIs operate in remote and difficult areas where communication and power infrastructure do not exist,

and are therefore constrained from using IT equipment required to run MIS applications.

## Outlook of MFIs

It is evident that the MFIs around the world are diverse in their structure and practices. Following are some of the factors that differentiate MFIs from each other:

1. Type of organization:
   - NGO
   - MFI (non-regulate)
   - Regulated MF Institution
   - Microfinance banks

2. Type of Products and Services:
   - Minimalists (those who offer only credit services)
   - Loans as well as savings services
   - Full range of products (including loans, deposits, remittance, insurance, leasing and social services)

3. Organizational Structure:
   - Branch setup (small, medium and large)
   - Staff structure
   - Departments (cost centre and profit centre)

4. Size:
   - Branch network
   - Portfolio size
   - No. of employees
   - Sections and departments
   - Growth

5. Geography:
   - Area specific (operations are limited to a small area)
   - Country specific (operations are spread over an entire country)
   - Global operations (operating in multiple countries)

6. Operational Environment:
   - Rural areas
   - Urban areas
   - Other

7. Processes and procedures:
   - Models (associations, cooperatives, credit unions, Grameen, etc.)
   - Methodologies (individual, group, village banking, community banking etc)

8. Regulatory environment

9. Reporting:
   - Management reporting
   - Stakeholder reporting
   - Microfinance networks and peer group reporting

## Information Systems used by MFIs

The microfinance sector is also quite diverse in its use of information systems. Generally there are the following three types:

***1. Manual System***

Some MFIs still rely on manual systems, which involves maintenance of records in forms and ledgers. Organizations having manual systems are either small micro-credit programs or NGOs.

***2. Semi-automated System***

More than 50% of MFIs are operating in a semi-automated mode. Within this category, the spreadsheet is the common tool being used either in conjunction with a manual system or with an MIS application that does not fulfil the information requirements of the MFI. The majority of non-regulated MFIs have semi-automated systems.

***3. Fully Automated System***

Few MFIs are fortunate enough to have a fully automated and integrated MIS, fulfilling the whole information requirements of the organization. Such systems are existent with banks or regulated MFIs.

## Disadvantage of manual systems:

Some of the disadvantages of manual Information Systems are:

- Too laborious and time consuming.
- Prone to Errors.
- Data manipulation and analysis is very difficult.
- Maintenance of large amount of data is almost impossible.
- Data and information is not secured.
- Loosely controlled.

- Highly inflexible (addition of new products and change in business processes can not be made).
- Business continuity is at risk in case of damage to information due to fire, water or any other disaster.
- Reporting is very cumbersome, time consuming and difficult.

## Benefits of computerised MIS to Microfinance

There is no doubt that "*the right information*" at "*the right time*" at "*the right place*", is crucial in decision making. Therefore, information and data is considered among the most valuable assets fundamental to the success of an organization. The primary roles of the MIS are to capture information, create new information, store information, and convey information to the user.

The two major objectives of MFIs are Outreach and Sustainability. MIS can add substantial value in achieving both the objectives:

- A major advantage of MIS is that it provides easy access to accurate and up-to-date information. For example, loan officers get information on loans that need follow-up, branch manager's can monitor daily progress of the branch, and senior management can get a full picture of the portfolio performance and quality. Customers also get quick information on their accounts, payments and balances.
- Detailed information is captured on customers and their activities that can then be used to assess client business to assess impact. It is also useful in tracking historical information of clients.
- Activities, such as disbursements, repayments, deposits, withdrawals and money transfers are completed faster, better controlled and with minimum opportunity for errors.
- Information is produced in user-required formats, which facilitates better understanding, setting priorities, objectives and strategy.
- Key performance indicators provide an overview of the organization's performance, efficiency and effectiveness of business procedures so that timely adjustments can be made.
- Use of ICT helps make MFI services more interactive, accessible and transparent.
- In terms of innovation, ICT provides full flexibility to structure products and services to the needs of its target group.
- Efficiency and productivity of staff is increased, as they are able to manage more products, customers, and transactions in less time.
- To meet target market needs, introduction of new products and setting procedures is easy and can be quickly applied throughout the branch network.
- It can also provide the flexibility to integrate with other applications and delivery mechanisms

MIS lowers transaction cost, increases productivity, reduces risk of failure, and pushes the boundaries beyond bricks and mortar infrastructure to carryout business.

## Integration and Consolidation

With the growth and advancement of the microfinance industry, new innovations are being witnessed. Among these innovations, technology-based delivery channels and mechanisms are creating opportunities as well as intensifying the competitive environment for MFIs. These channels are not only targeted at lowering transaction costs and extending the reach of MFIs to large populations, but are also focused around customer convenience. These technology-based mechanisms enhance efficiency of the MFIs, while posing substantial challenges in managing such technologies. One of the main challenges is that of **integration** and **consolidation**. It is essential that the back-office MIS has the flexibility to integrate with such systems.

The back-office MIS has received little attention within the sector. The general perception is that new technology-based delivery systems would easily integrate with the core MIS, whereas in reality it is not that simple. Examples show that MFIs that have adopted such systems without assessment of their core MIS are struggling to integrate these. Because of non-integration, MFIs fall back on electronic spreadsheets or manual procedures to prepare consolidated information. Integration and consolidation are very important for MFIs and inability to integrate new technological innovations holds them back, making them less rather than more efficient.

## Back-office MIS *"Starting Point for MFIs"*

The backbone of any Information System (IS) is the core MIS as it holds the critical data, and manages the information. All other systems are add-ons. A simple core MIS comprises of two parts:

i. ***Database*** - data structure; an organized set of tables designed to the needs of the business. All data of the organization resides in these tables.

ii. ***Application Software*** – comprises of the user interface, business processes, procedures, reports and queries.

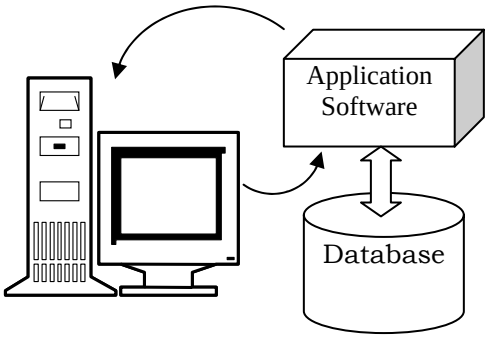


***Fig 1: Core MIS***

Adopting an MIS is strategically important for MFIs. They need to undertake a careful and detailed assessment of current and future needs before committing to a particular solution. Much of the system's flexibility, expandability, and robustness depend on the strength of the backend components. Strong core MIS can deliver cost-effective integration of data, channels and processes, facilitating a single consolidated view of the whole portfolio. Core MIS can provide easy data entry for the backend database, making consolidation easy to achieve.

Various studies reveal that a large number of MFIs operate manual systems despite having some kind of MIS in place. One of the reasons the MIS does not cope with the changing needs of the organization is that the backend does not have the right structure. It is important for both the MFIs and microfinance software vendors to concentrate and strengthen the Core MIS.

Figure 2 shows a basic structure for the Core MIS for microfinance:

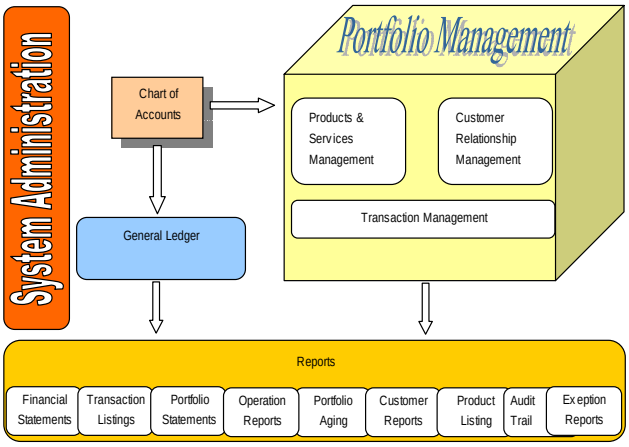


***Fig2: Core MIS for Microfinance***

## Other Key Deciding Factors for IT Systems

While the MIS needs to fulfil the business requirements of the organization, but other factors including appropriate infrastructure and hardware are also important in the success and optimal utilization of information systems. We can categorize the components of an information system solution into five areas:

1. ***Physical Architecture (Electricity/Power & communication infrastructure)***

   Physical architecture consists of basic wires or cables to gateways and powerhouses. Together with buildings, offices, and computers, the architecture provides services of voice, data, image and video transmission while the consistent power supply keeps everything live and running.

   Every system needs electric power, and if systems are required to communicate, then there must be an appropriate communication infrastructure. Usually MFIs operate in remote and underdeveloped areas where this is lacking.

***2. Network***

Three types of environment setups could be made.

i. Standalone Environment; MIS is run on individual PCs and data is stored locally.

ii. Local Area Network (LAN); PCs are connected together to create a LAN. The network can be either peer-to-peer or client/server. Desirable is the Client/server network where data is stored and shared through a server in a secure way.

iii. Wide Area Network (WAN); Branch offices and operation units can be connected through a WAN. It requires proper communication infrastructure and involves high cost to establishing a WAN. For online systems WAN is critical.

***3. Hardware***

Type of hardware depends on the network environment. A client-server environment requires server and switch for connecting the workstations / PCs.

***4. Database***

Generally databases can be categorised as local and client-server. Each category has its own strengths and weaknesses. These details can help MFIs in selecting the appropriate database:

i. Local databases

There are a number of local databases but the most widely used databases are Microsoft Access, FoxPro, Paradox, and file maker.

Strengths
- Easy to setup and configure
- Low hardware requirement
- Low cost
- Good performance with less data load

Weaknesses
- No database management
- Unable to handle large data
- Risk of data corruption
- Data is not well protected
- Low performance when used by concurrent users and data load
- Not scalable with hardware
- Low transaction control, there is no rollback for incomplete and inaccurate entries

ii. Client/Server databases

Most popular client/server databases also called enterprise databases include; Oracle, DB2, SQL Server, MySQL, Sybase, and Informix are some of the commonly used client/server databases:

Strengths
- Database Management System
- Excellent performance under load
- Design to handle large data
- Manages large number of concurrent users
- Scalable with hardware
- Detects and corrects data corruption dynamically
- Rollback for incomplete and inaccurate entries
- Highly secured
- Perfect in network environment and for web applications

Weaknesses
- Complex to configure
- High cost
- License fee per user
- High-end Hardware requirement
- Requires technical skills

***5. Application***

A combination of business processes and procedures, user interface, reports and controls operate on top of the backend system. A large variety of software development and report generation tools are available and used to write software applications.

## Getting the Right Fit

MFIs face great challenges in choosing the right system solution that can best fit their business needs. An MIS for microfinance must have the following characteristics:

1. ***Cost effectiveness***: Total ownership and lifetime system operations costs, including hardware, software, network, infrastructure and human resource.

2. ***Functionality & flexibility:*** Fulfil maximum of the current business requirement and flexible enough to incorporate future changes. Capture and generate

relevant information on an individual, group, and at a consolidated level.

3. **Reliability**: Incomplete and unreliable systems are dangerously risky and can hamper the business. Such systems do not produce the right results and are unable to complete processes to the desired level. Users could be misguided by such systems.
4. ***Simple to use***: Should be user friendly and easy to setup and operate. Activities can be performed in a systematic way and flow.
5. ***Scalability:*** System should accommodate changes to products, services and delivery channels. It should grow as the business grows. For example, if the system design is scalable, it can be run on an individual PC, Local Area Network (LAN) or Wide Area Network (WAN).
6. **Integration:** Combining data from multiple sources is of great importance to microfinance. Integration of branches to get single consolidated picture should be a priority.

## Challenges faced by MFIs

1. Microfinance is a rapidly changing industry. Due to the ongoing evolution of the industry, MFIs face difficulty in defining business objectives, needs, priorities and limitations for acquisition of an MIS solution. There is lack of standardization within the microfinance sector, and business practices of MFIs differ from each other. Consequently, software developers face problems in coming-up with an MIS that can be used by most of the MFIs. Common failures are due to ill defined business process and procedures.
2. There is a shortage of skilled professionals who can understand technology as well as the microfinance industry, and be able to suggest the right solution. Such professionals can act as a bridge in filling the gap between use of ICT and microfinance operations
3. Majority of the MFIs do not have the technical capacity and required resources to understand, adopt and implement MIS solutions.
4. Most MIS solutions are not affordable to the majority of MFIs.
5. In some cases there is a lack of vision and commitment from the management towards use of technology
6. Integration is becoming one of the big challenges, as most of the MIS solutions for microfinance are built on weak platforms, thus not being flexible and scalable enough to integrate with emerging technologies and delivery channels.
7. There is poor information sharing on successful MIS deployments within the microfinance as well as the financial sector.
8. ICT vendors still do not see the tremendous business opportunity and growth in the microfinance industry, thus are reluctant to invest and establish strategic partnerships with MFIs.
9. Power and communication infrastructure, which is the foundation for hosting ICT services, is inadequate in those areas where MFIs operate.
10. Non-availability of efficient technical support by vendors

## Recommendations:

1. FMFB's experience of adopting technology suggests that MFIs should invest in relevant technologies after thorough and careful assessment of their requirements. The requirement should be addressed in perspective of current needs and future plans.

2. So far the core MIS of MFIs has been neglected. MFIs should get their core MIS right before opting for any kind of delivery system.
3. The software industry needs to do more in developing quality software for microfinance sector.
4. Capacity within institutions to manage technology is key to successful implementation and operation of its MIS. MFIs should employ skilled IT professionals on their staff.
5. MFIs must adopt MIS solutions that not only meet their needs but are also manageable by the MFI from all aspects. In some cases small and medium size MFIs go beyond their needs in adopting an MIS that ultimately becomes a drain on their resources. Such systems reduce the organizations overall efficiency and ultimately their sustainability.
6. MFIs can get maximum benefit by investing in technology, and putting in a better MIS solution that works for them. MIS is a strategic investment for MFIs.
7. Progressive policies that make ICT accessible and affordable to the majority of the population is important for encouraging the use of ICT within microfinance and for the development of the microfinance sector.

## Conclusion

The use of ICT can rightfully be to the strategic advantage of MFIs. Innovations in ICT have transformed traditional approaches to microfinance, facilitating growth and reducing cost. Some of the players have already started getting the benefit by using MIS and similar IT solutions, while the majority of the MFIs have yet to realize the importance of its use to achieve outreach and sustainability. The implementation of the right MIS still remains a big challenge faced by MFIs. Efforts are also made from various corners of the world in overcoming these challenges. CGAP's Information System Support is a prudent initiative to assist MFIs in getting access to ICT, aligning their MIS and using the appropriate IT solution. One of the realizations is "first things first" i.e. having an appropriate core MIS first before other systems: keeping in mind the strategic importance of ICT to the microfinance industry, renewed efforts are required from all the stakeholders to overcome the challenges faced by the microfinance industry in taking on IT.

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# ICT in Microfinance: A Bangladesh Perspective

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*The movement for harnessing the potential of Information and Communication Technology (ICT) for the development of the poor is gaining momentum around the world. Microfinance has already played a remarkable role in poverty reduction endeavours in the less developed countries. Better financial services for the poor through the appropriate use of ICTs could help the microfinance providers do even better. Bangladesh has a long track record of developing models and implementing microfinance programs. This paper explores the extent that ICT has been used in microfinance programs in Bangladesh. It looks into the use of ICT at the back-office MIS and in front-line transaction management. It describes the problems and challenges that microfinance providers and clients are facing in the present state of ICT use. The paper proposes steps that could help microfinance providers, through ICT innovations, to increase outreach and also become more efficient, transparent, and flexible.*

## Introduction

Since the digital technology era began, it has contributed to widening the gap between the rich and poor around the globe. In recent times, however, strong advocacy and innovation has occurred to harness the potential of ICT[1] for the development of the poor **[13]**. ICT4D activists are working to use ICT as an "enabler" or a "tool" for development. The presumption is that it will contribute positively to achieving the UN Millennium Development Goals (MDGs).

Microfinance has long been used as a direct strategy for poverty reduction in less developed countries. In a broader sense, microfinance can be defined as the delivery of financial services to poor households, so that they can manage their financial resources more effectively and cope with poverty **[6]**.

MFPs[2] deliver several kinds of financial services to poor households depending on demand, the capacity of the MFP, and the socio-economic context. In order to *eradicate extreme poverty and hunger*, microfinance plays a definitive role. In recognition of the importance of microfinance, 2005 is the UN International Year of Microcredit. Hundreds of millions of dollars revolve in this field covering a significant portion of the world poor. However, much more needs to be done, and the innovation of appropriate technologies in this field is critical in achieving the MDGs.

Bangladesh could be referred to as a *land of microfinance*. Since the liberation of Bangladesh in 1971, accelerating momentum in the NGO sector has enabled the poor to escape a vicious poverty cycle. Microfinance was included in poverty reduction initiatives in later years. However, due to its rapid expansion, Bangladesh houses the largest Microfinance program in the world. Besides NGOs, government agencies, specialized microfinance organizations and even commercial banks are now active in this field. Nevertheless, the extent of ICT innovation to facilitate further outreach and effectiveness of microfinance has not been explored to a large extent in Bangladesh.

[1]ICT is used in this paper as the short form of modern Information and Communication Technologies - the computer, Internet and other electronic computing devices.

[2]Throughout this paper, an organization providing microfinance to the poor is referred to as MFP (Microfinance Provider) rather than MFI (Microfinance Institute). There are many microfinance providing organizations which are not MFIs, namely BRAC, PROSHIKA, commercial banks, etc. Microfinance is one of the programs/sectors they undertake.

## Financial Services for the Poor

More than 47% people are still living below poverty line in this densely populated small South Asian country **[7]**. The demanding economic environment means that financial services for the poor are delivered throughout the country by hundreds of MFPs, both large and small.

### *Genesis of microfinance*

In the mid 1970s, PROSHIKA, one of the largest national NGOs of Bangladesh, started providing small amounts of money to very poor households with 'soft' repayment conditions. This effort did not start specifically as a Microfinance program, nor was it separated from other programs within the organisation. As PROSHIKA is not a microfinance institution (MFI), it did not only concentrate on the microcredit model. Later, in 1980, Grameen Bank came into the field as an MFI with a specific and structured microcredit program, and spread its model successfully at home and abroad. Now, the Grameen microfinance model is probably the mostly used model in the world, with minor peripheral changes required to suit the diversified social and economic contexts of different countries.

### *Microfinance providers and coverage*

Realizing the high demand, a huge number of MFPs were established covering 51 % of poor households **[7]**. The total number of MFPs is estimated at one thousand. Almost 50% of these are very small in size and have no branch office, and one-third of MFPs have less than five branch offices **[3]**. Some MFPs are giants, namely BRAC, Grameen Bank, ASA and PROSHIKA, which are well known in this sector globally. Grameen Bank and ASA are known as MFIs, while BRAC and PROSHIKA implement several other development programs besides microfinance, and are therefore known as non-government development organizations.

The Palli Karma-Sahayak Foundation (PKSF) is an apex body of most of the well-known MFPs, except Grameen Bank. It provides funds for microfinance and related support services known as *credit plus* to partner MFPs rather than providing loans directly to borrowers.

| **Provider** | **No. of Borrowers** | **% of Total** |
|---|---|---|
| BRAC | 3,752,537 | 24 |
| Grameen | 3,626,937 | 24 |
| Asa | 2,523,005 | 16 |
| Proshika | 1,541,876 | 10 |
| Govt. Agencies | 1,461,839 | 9 |
| Other PKSF Partners | 1,256,979 | 8 |
| Commercial banks and small MFPs | 872,458 | 6 |
| PDBF | 393,652 | 3 |
| Total | **15,429,283** | **100** |
| Effective coverage (allowing for 33% overlapping adjustment | **10,337,620** | |

**Table 1: No. Microfinance Borrowers** (as of Jun 04)
*Source: Palli Karma-Sahayak Foundation (PKSF)*

Unlike other less densely populated countries that have a lesser number of MFPs, the overlap in financial services between MFPs is too high (33%) in Bangladesh **[7]**. It can be seen from the above statistics that about 75% borrowers belong to only four big MFPs, which operate nationwide programs.

Besides the high degree of overlap, 61% of effective coverage are the eligible poor borrowers as per the policy of the MFPs **[1]**. This figure denotes that MFPs ignore, either consciously or unconsciously, the eligibility criteria of borrowers when providing loans. Among the total microfinance borrowers 90% are women **[7]**.

| **Items** | **Figures** |
|---|---|
| Total number of households | 26,083,379 |
| Households below poverty line | 12,358,392 |
| % of households below poverty line | 47 |
| Effective households covered | 10,337,620 |
| Effective poor households covered | 6,334,894 |
| % of poor households covered | 51 |
| % of poor households uncovered | 49 |

**Table 2: Household Coverage by Microfinance**
*Source: Palli Karma-Sahayak Foundation (PKSF), 2004*

Despite 30 years of microfinance experience by a great number of MFPs, and relatively easy access to the majority of locations within Bangladesh, the un-reached poor still stands at 50%.

### *Products and process*

All the MFPs provide small amounts of credit (typically USD80-300) to individual borrowers through a collective identity within the community. Regular savings with the MFP are mandatory for most borrowers. With the mandatory savings, fixed deposit and social security insurance are offered by most of the larger MFPs. The larger MFPs also offer credit services for small enterprises, but the size of loan of this product should not be termed as *micro*, as the loans are relatively large (up to USD 10,000).

All the large MFPs except PROSHIKA had been practicing individual record keeping, weekly repayments and a saving system for some time. Recently, PROSHIKA has also been practicing this system, leaving a more collective and monthly repayment system with suggestions from PKSF.

With the less diversified social and economic contexts in Bangladesh, MFPs throughout the country follow similar business models and work processes. After assessing the credit score according to the written policies, MFPs provide credit to group members individually from its branch office, for mostly a year with weekly repayment arrangements. To take out loans borrowers must come to the branch office, which is considerably far from most of the borrowers, and spend a minimum one working day for taking out the loan. Credit staff of the MFPs collects weekly instalments of all kinds of credit, savings and insurance at the *meeting place* of the borrowers' group in the community. Usually, the meeting place is not far from the borrowers' house. Unlike the cases of some African and Latin American MFPs, *external agents* are hardly involved in the disbursement and repayment process of the services.

## ICTs in Service

Is the process model characterized by the technology, or are technologies being innovated or shaped in accordance with the process model?

This is a question that frequently appears in the minds of System Analysts. In short, it depends on a number of factors of the existing process model including efficiency, dependencies to other systems, creator and owner of the model, availability, affordability, handling capacity and Return On Investment (ROI) of the technology. One of the appropriate theories to analyse these questions is Actor Network Theory (ANT), which is mostly used in academic research and the arena of technology innovation and implementation **[12]**.

The microfinance process in Bangladesh is a long used model driven by economic, social and cultural factors. It was innovated and is still being characterized mainly by the high density of population, strong demand side, and the availability of low-cost employees. With the exceptions of some large MFPs having only back-office MIS, the conventional calculator is the only technology on which around 90% MFPs still depend. It is because of an aggregate-function of many independent and inter-dependent social and economic variables. Thus, the microfinance process model has neither changed for a long period of time, nor significantly shaped by or for ICT. However, the use of ICT for microfinance has not been spread and intensified in the MFPs of the country, it has a long history.

### *Inception*

In 1986, the founder and the President of PROSHIKA, Dr. Qazi Faruque Ahmed, returne from an international conference and told his 40 Monitors and Accountants of the microfinance program that they need not continue with their regular duties. Dr. Ahmed told them that he would give a machine called a *computer* to do those *donkey jobs*, and that the staff would be doing more creative jobs for the organization. Microfinance staff became afraid of losing their jobs but Dr. Ahmed told

them to rest assured. That was the time when computers started supporting microfinance in Bangladesh. Until that period no development organizations had used computers.

At that time, the microfinance portfolio of PROSHIKA was only around one million US dollars, but its records and accounts were not manageable manually by 40 people. Presently, PROSHIKA handles the transactions and accounts of more than 150 million US dollars in microfinance, which is managed by a few people with the help of ICT.

However, neither PROSHIKA or even the world's largest MFPs that introduced ICT to their respective programs could envisage *e-microfinance*. ICT is still confined mainly to back-office MIS, even though quite some time has passed since 1986 and a tremendous ICT innovation movement has continued throughout this period. Hundreds of MFPs have not yet come out of calculator-based technology in Bangladesh. Although experiences suggest that ICTs can help make certain MFP activities faster, cheaper, and simpler, as they involve less people and paperwork, they can also help make MFPs services more interactive, customized, personalized, achievable, searchable and transparent **[9]**.

### *Back-office MIS*

ICT-based back-office MIS in the microfinance field is relatively old in Bangladesh, but the number of MFPs that have ICT-based MIS is negligible. However, since the recent past PKSF has been providing a back-office MIS to its partner MFPs. It is an in-house developed database software which mainly provides macro level aggregated reports for use by senior management of the MFP, PKSF, government monitoring agencies and external donors. PKSP is trying to make use of its software mandatory for those MFPs that take loans from the organization. However, the large MFPs like BRAC, Grameen, ASA, PROSHIKA and commercial banks use their own MIS, which are functionally similar to that of PKSF, and much confined to back-office management and external reporting.

The PKSF and Bangladesh Bank (the state bank) have recently been developing a Credit Bureau Database to be used by MFPs throughout the country. It will contain the basic information of borrowers to prevent overlapping (currently 33%). Partner MFPs provide basic data of their borrowers on a regular basis to PKSF. The PKSF and Bangladesh bank also use the data for research purposes from this repository.

It is worth mentioning that no MFP has adopted ICTs for increasing their outreach. Rather, they have been using it to manage the data of huge borrowers captured by the low-cost manual labour from the strong demand side and other favourable environments.

Lack of awareness, intuition-driven decision making practice, fear of investment in ICT, conservative record-keeping and accounting practices, availability of low-cost employees, and the non-availability of dependable ICT-finance professionals are the main reasons behind the ICT neglect (even in the back-office MIS) in the cases of most MFPs. Non-availability of a standard common MIS for microfinance that suit the policies and procedures of all MFPs (as opposed to the MIS found in conventional commercial banks) is also a reason behind this scenario **[8]**.

### *Front-line transaction management*

Before 1997, no MFP had brought ICT out of its head office for managing microfinance data. In 1997, PROSHIKA computerized its Area Development Centres (ADCs) with its in-house developed software, to decentralize the computerization of transaction data, and to help front-line decision-making, operations and monitoring. PROSHIKA has 200 ADCs. There is no intermediary office between the ADCs and the head office. Recently it opened up four-five sub-ADCs in each ADC, as outposts to perform microfinance operations thereby accessing the deeper layer of the

communities. However, the sub-ADCs have not been computerized yet. Sub-ADC credit staff bring the manually recorded transaction data each week to the respective ADC to computerize it, and the ADC sends the data to head office on a monthly basis. Hence, the field office computer does not know about 70% transactions that occur in sub-ADCs before one week, and head office cannot know about any transaction before one month. At the other end, borrowers are yet to see the technology crossing the digital divide.

BRAC, Grameen Bank and ASA also brought ICT to their respective area or branch offices, but like PROSHIKA, no MFP uses ICT directly with their borrowers. In the cases of all MFPs that use ICTs in field offices, data transmission to head office happens once in a month either through FTP/e-mail with dialup connectivity or manually on CD.

The commercial banks that provide microfinance are not ahead of the large non-commercial MFPs in using ICT, particularly for their microfinance operations. Even government agencies involved in microfinance are lagging far behind in using ICT for microfinance.

ASA is an astonishing case. It is one of the largest MFIs in the world. It deals with more than two million borrowers but still uses a manual information processing method for its microfinance operation **[2]**. After mid 2005, it started using one personal computer in its district office that maintains around 50 branch offices. Each credit worker of a branch office deals with around 600 weekly repaying and 500 monthly repaying borrowers, records all their credit and savings transactions manually on a register, and updates all the individual passbooks of all the borrowers. The Branch Manager only sends the branch's aggregate monthly figures. This is calculated by using the conventional calculator from the registers to the respective district office and then entered into the recently installed computer. No detailed transaction records are available above the branch office layer of the organization. After observations and discussions with ASA staff, it appeared that ASA could be an interesting plot for management and information system research to many. Interesting findings are likely to come.

From the observation of the scenario of technology usages in front-line transactions, it comes into view that even the large MFPs, which use ICT in back-office MIS are a long way from *e-microfinance*. In present manual processes and practices, MFPs:

i) cannot detect problems when they occur
ii) cannot predict things using real-time data
iii) cannot make an analysis using detailed data
iv) face problems with error data where *"client confidence"* is of paramount importance
v) need to deploy a large number of human resources for smaller coverage where about 50% of the poor are yet to be covered, and
vi) face so many related problems.

Hence, most of the MFPs cannot go for wider coverage even with the simplified manual process, high demand side, and favourable social, geographic and economic environments. In most of the cases, decisions are driven by intuition instead of information. Due to the absence of technologies in the front line, fraud by credit workers is a common practice. In many cases, fraud cannot be detected before the costly regular auditing or special investigation is made. There are instances where theft of more than 20,000 US dollars theft were discovered after the credit worker had left the country.

On the other hand, borrowers:

i) remain gloomy about the money they payback where transparency is lacking in credit operations
ii) are cheated by the credit workers and/or cunning group members
iii) have to maintain the time for the transactions mostly determined by a credit worker at his/her convenience
iv) cannot meet the immediacy of taking or repaying the loans, and
v) cannot come out from social silence to empowerment crossing the digital divide.

### *Innovative technologies in the front-line*

A number of Indian, South American and African MFPs have been working for technology innovation in front-line transactions to overcome similar problems that the Bangladeshi MFPs have been facing. They are piloting the use of Personal Digital Assistants (PDAs), Automated Teller Machines (ATMs), Smart Cards, Biometrics Technology and even Interactive Voice Response (IVR), sometimes in collaboration with the technology firms. CGAP IT Innovation Series (www.cgap.org) is one of the prominent disseminators of these technologies and processes for microfinance. In many cases, positive results are being observed, depending on the appropriateness of the technologies in the context.

PDAs are a small portable computer suitable for entering data in front of borrowers at the meeting place. If the relevant infrastructure exists it can also be connected to the back-office MIS from the field. Even if the connectivity does not exist, the entered data could easily be transferred to the back-office MIS at the end of the day. Besides the transaction data entry at the collection spot, PDAs can provide related information to the borrowers as well. It seems to be adaptable with the existing business model and process in the microfinance practice in Bangladesh, and it is expected to resolve most of the existing problems of the MFPs and borrowers mentioned in the previous section. It is worth mentioning that the ICT could be an incredible tool for MFPs but not a panacea **[11].** Other technologies that are more sophisticated require no credit staff at the transaction spots, but may not easily be adaptable in the present context, mainstream microfinance practices, and the concept of *social collateral*. The environment can either support or hinder the adoption of *e-microfinance* **[2]**.

Although one of the largest microfinance-providing countries with long experience in the field, Bangladesh has not moved towards the use of ICT with borrowers in the front-line. In order to increase the outreach and to overcome problems of MFPs and borrowers mentioned in the previous sections, it is imperative that MFPs implement the appropriate technologies in the front-line.

Undoubtedly, it will be challenging work to achieve this, where a large portion of the population lacks vital services such as electricity and telephone, and where even the giant MFPs could not bring technologies to their sub-branches. The proper re-engineering of the long-term exercises of microfinance business processes remains a challenging task. Technology can misfire if not accompanied by business process re-engineering **[4].** Overcoming the problems of technology phobia, the lack of management leadership, scarcity of ICT-finance experts, fear of loss of control, fear of investment, erratic electricity, nonexistent/unstable infrastructure, fear of rapidly changing technologies, political and social violence, and unfavorable financial and ICT regulations are also challenges towards innovating and implementing successful technology in the microfinance sector in Bangladesh.

### *Remittance transfer – a new avenue of MFPs*

A significant portion of the national income of Bangladesh comes from remittance of international labour migrants, and the family members of the migrants typically live in communities where no financial or other service organizations work as closely as the MFPs do. With the existing products, remittance transfers could be added as a new product line of MFPs of Bangladesh. This could be done by intensifying the use of ICT and opening booth/exchange houses abroad, or by establishing international partnership. It would significantly minimize the transfer cost and time, which would help decrease sending money in illegal ways including smuggling **[10].** With this new avenue, several opportunities would open to MFPs and remittance receivers. It would help increase the liquidity and scale of MFPs, and remittance receivers would have the opportunity to engage in long-term economic activities with the MFPs instead of spending the money for non-productive things as the present practice is.

Besides, using the ICT infrastructure of MFPs, migrants and their families will be able to communicate easily which is very much desired by both sides.

The main barrier is the existing financial regulatory framework towards opening this opportunity to the poor and the pro-poor organizations. The government should establish enabling policies and a regulatory framework for the MFPs with realistic control mechanism, while the MFPs should go forward with an appropriate technology, demand-driven products, and smooth and transparent process model at the doorstep of the clients in order to bring real benefits to both the parties.

## Conclusion

MFPs of Bangladesh have achieved much in providing financial services covering a huge number of poor with the traditional business model, mainly because of the high demand side. ICT usage in microfinance is not new here, but has not been intensified, and no technology innovation exercises have taken place so far in this sector. Several MFPs around the world have been working for technology innovation to increase outreach and sustainability where MFPs and borrowers enjoy more simplified and flexible ways to deal with transactions.

Having almost 50% of the poor out of reach, and a non-transparent, rigid process model with many pitfalls, MFPs of this country need to intensify the use of appropriate technology through innovation with required business models and process re-engineering towards *e-microfinance*. In order to have *e-microfinance* in place there are some critical things to attain.

First, the decision makers and the management of MFPs need to be convinced that ICT is a useful tool for scaling up effective, efficient microfinance. Second, the ICT and financial regulatory regimes that hinder rather than enable innovation need to be reformed. Third, management leadership and ICT-finance professional development need to be done. Fourth, a consortium of large MFPs including commercial banks and technology firms would undertake rigorous piloting of technology innovation and business process re-engineering using appropriate methodology to develop replicable models. Fifth, step-by-step strategy would be applied considering ROI of the new technology **[5]**. Sixth, power and infrastructure improvement/alteration should be taken care of.

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# Brazil's Banking Correspondents

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*This paper discusses the role of 'banking correspondents' (BCs) in Brazil. BCs are retail, postal, and lottery outlets that offer access to a range of financial services on behalf of state-owned and private sector banks. Although it is not clear how many poor people are using BCs, and which services they are taking advantage of, BCs have nevertheless given both rural and urban communities access to formal financial services that may eventually result in tailored products for micro-entrepreneurs. Banks have not obtained a fully effective methodology to manage credit risk and build viable lending operations to consumers and micro-entrepreneurs through the BCs, but are hopeful to solve these challenges in the future.*

## Introduction

Microfinance is about building a distribution channel for low-value, high-volume financial products and managing the credit risk of small loans to poor people. A number of banks in Brazil have developed a home-grown, sophisticated delivery channel that they call "banking correspondents" (BCs). Using technology and partnerships with retail lottery and postal outlets, these banks have opened millions of new accounts in a few years in urban slums, peri-urban areas, and even rural and remote locations. BCs have not been specifically designed for typical "microfinance" clients i.e. the self-employed poor, but over time may be used to deliver micro-enterprise credit.

This paper was written largely on the basis of interviews with management of the four banks described here, as well as microfinance experts in Brazil. It also relies on research (forthcoming) conducted by Anjali Kumar, Adam Parsons and Eduardo Urdapilleta of the World Bank.

## Background

### *What are banking correspondents?*

Banking correspondents (BCs) are fully serviced retail agents for banks. Using technology (such as EFTPOS devices and communications networks) and business arrangements with retailers (such as grocery stores, drugstores, gas stations, the postal company, and the lottery outlet chain), BCs offer services including savings deposits, credit withdrawals, bill payments, new account openings, money transfers, insurance, and government benefits including pension receipts to provide access to financial services people active in Brazil's informal economy.

The largest operators of BCs are:

- Caixa Economica (state-owned, 14 000 BCs)
- Banco Postal, run by Banco Bradesco (private, mostly postal outlets, 7 900 BCs).
- Banco Popular, owned by Banco do Brasil (state-owned, 6 200 BCs)
- Lemon Bank (private, 3500 BCs)

These BCs now serve every municipality in Brazil, including remote areas only reachable by several hours travel in either a boat or plane. Since 2000, when the model first emerged, these banks have together opened about 8 million current accounts, principally for people that have not previously held bank accounts.

### *How do they work?*

The banking correspondent model is technologically intensive. The banks use a combination of the following devices at either a retail outlet, post office, etc: an EFTPOS device, a bar scanner that scans bills for bill payment transactions, an entire PC, a PIN pad, and some form of teller machine with a screen. Banco

Popular has three configurations (depending on the transaction volume) – a simple EFTPOS device, a PC with high-speed connection, and a stand-alone mini-branch with several computers. Some BCs are always online, and others dial-up every few hours to update the central server.

The retail outlet provides a staff member to operate the device and handle transactions for clients. Clients are given bankcards, which in some cases are debit cards, such as VISA Electron. To make a withdrawal, clients swipe the card, enter a PIN, and request an amount from the attendant with a VSAT connection. The entire process can take as little as seconds in outlets where the EFTPOS device uses a VSAT connection (satellite telecoms) to access the central server that stores account information. A similar procedure is followed if the client is depositing money or making a transfer. For bill payments, the client hands over the bill and the attendant swipes it through the barcode scanner. The operator then takes the cash payment from the client, and prints out a receipt.

Operational approaches differ. Banks such as Caixa and Banco Postal identify retail outlets themselves and handle all equipment, training, contracting, etc. Lemon Bank and Banco Popular are start-up banks that have lean operations and use intermediaries to identify, train and support BCs. Banco Popular has only eighty staff, but has 7,900 BCs and 2.8 million new clients in less than two years of operation. These banks use private companies to manage the correspondents. These are private companies, which were previously focused on technology networks and management, and today contract and monitor BCs on the banks' behalf. Management companies assume all liability for cash handled by the BCs.

Risk and return (in the form of transaction fees) are shared among the bank and the retail outlet. If there is an intermediary that supports the retail outlet (i.e. a management company such as Netcash), this company also takes a share of fees.

For retailers, the primary benefit is the increased foot traffic in the store, particularly on days when pensions and government benefits are distributed, resulting in lines of customers at the banking counter.

***Why Brazil?***

There are several reasons why BCs have emerged in Brazil.

First, Brazil's banks are all relatively technologically advanced, which is, in part, a legacy of the hyperinflation years. For many years, checks deposited anywhere in Brazil have been cleared within 24 hours in comparison to the US where it can take 3 days. This is evident with Banco Bradesco which was apparently one of the first banks in the world to offer Internet banking. Lemon Bank was founded by two Internet entrepreneurs.

Second, the government has fostered innovation in delivery channels by finding a unique balance between protecting customers and encouraging experimentation. In the past thirty years, the Banco Central do Brasil has streamlined account-opening norms and gradually relaxed guidelines for using agents to deliver banking services, to make the model available for unbanked areas.

Third, strong unions and strict rules on working hours and salaries make it expensive for banks to open new branches in underserved areas. This may have encouraged a search for alternate channels.

Fourth, the opportunity to deliver high-priced credit gives banks incentives to build a distribution infrastructure to reach countless more borrowers. Brazil's interest rates on consumer credit (50-60% p.a. on credit card debt) are high because of high discount rates (18-19%) and the requirement that banks place

45% of sight deposits in reserve at the central bank, at 0% interest. To encourage microfinance, the central bank permits banks to take 2% from the 45% allocation and make small loans at 24-48%, otherwise the 2% would earn nothing. This opportunity may have also encouraged the establishment of a delivery channel in low-income and rural areas.

## Banking Correspondents and the Poor

### *Are the BCs reaching poor people?*

It is difficult to determine how poor the customers of BC's are. Clearly, the channel has had great success in bringing the "unbanked" into the financial system: there are now more than 27,000 BCs, and the four banks mentioned above have acquired roughly 8 million new account-holders in the past three to four years. The government has helped: Banco Postal was required by its tender with the postal company to serve first those municipalities without banking services.

According to research by the World Bank, the BCs are serving poor people. Their data states that 50% of Caixa's BC clients earn less than R$200 per month (US$ 80)[1]. Nearly 60% of Banco Postal's clients are in the same category.

Most banks report that their BCs are targeting the fairly large layer of pensioners and informally-employed low-income people. Reaching deeper to self-employed micro-entrepreneurs is not an explicit goal as yet.

Nevertheless, the BC model seems to be a powerful way of increasing access to financial services for all customers – regardless of poverty level. The channel is an attempt by banks to reach unbanked communities, not an attempt to deliver microfinance in the traditional sense. However, as banks grow increasingly comfortable in these communities by operating through BCs, they may become more knowledgeable about the financial services poor people require. Over time, this positive first step may lead to more tailored products for micro-entrepreneurs.

### *Will the BC channel deliver micro-enterprise loans?*

Most bankers when asked about micro-credit claim that the small personal loans they offer through BCs are exactly that. However, the central bank is now encouraging banks to make "productive" micro-credit loans. Under this definition the bank must use a loan officer, can charge up to 4% p.m., and can lend up to R$5,000 (US$ 2,000).

But since it only involves an EFTPOS device and a store employee, the BC channel is not well equipped to make loans of this type yet. To overcome this, those banks that are focused on lending (Banco Popular, Banco Postal and Caixa) will have to partner with local MFIs / NGOs who can appraise and monitor clients better, or build a scoring methodology using account transaction patterns to help assess risk.

Banco Popular is trying a more innovative approach by providing loans to each and every customer, to build individual credit histories that the bank can use as the basis for further larger loans. All Banco Popular customers receive an automatic R$ 50 loan in their account which they must repay. If they do, they are recorded as a good borrower and may receive a larger loan. If they do not, the bank lists them on a blacklist and eventually reports them to the credit bureau.

This approach daringly sidesteps the careful lending methodologies for which the microfinance movement is known. If it results in acceptable initial losses, the bank may be able to generate a powerful database that can drive individual loans to micro-entrepreneurs in the informal sector.

[1] Or double the minimum wage in Brazil.

## Business Model

### *What's the business model?*

The banks are trying to make money with transaction fees and with consumer lending. Lemon Bank, which mostly handles bill payments, is clearly focused on generating fees, which it shares with its management company intermediaries and the retail outlets. Apparently, it may also ramp up insurance and credit products. Banco Popular, Banco Postal and Caixa place greater emphasis on making lending operations profitable, since they are largely pricing the current account product to break even (i.e. Banco Popular gives clients 12 free transactions – 4 withdrawals, 4 deposits and 4 balance inquiries – per month, and charges no monthly fee).

But so far the banks haven't hit upon a winning lending methodology. Clearly, the banks are using the BC channel to deliver consumer credit and small loans against pensions to accountholders according to the first definition of "micro-credit" laid down by the central bank. (2% per month interest rate, maximum loan size of R$1,000). However, since most new clients don't have a credit history, the banks are lending somewhat blindly. For at least one bank, arrears are roughly 10-12%, but according to the microfinance 30-day definition, portfolio-at-risk is probably about 33%. As mentioned earlier, Banco Popular is incurring losses to build its own credit history database.

## The Future – Risks and Opportunities

### *What's in the future?*

The main challenge for banks will be to find a way to manage credit risk and build viable lending operations to consumers and micro-entrepreneurs through the BCs. Scoring (Banco Postal) and partnerships with MFIs (Banco Popular) are currently being explored.

Bank employee unions seem to be arming for a battle, given the rapid growth of BCs (from zero to 27,000 in about 5 years), and the exquisitely lean operations of some banks. As mentioned earlier, serving 2.8 million new account-holders, Banco Popular has a staff of only 80. Apparently retail unions have also made noises because retail employees are being asked to handle banking transactions, not retail work – and some employees may see handling considerable amounts of cash as risky.

Second, the BC operations are still in their high-growth stage, and a shake-up of some sort may take place in the not too distant future. Competition to set up BCs is starting, especially since there may be only one or two reliable retail partners to be found in many areas. Bradesco (which runs Banco Postal) and Caixa may have the edge, since the post offices are reliable local partners, and lottery outlets appear to be nearly universally frequented. In addition, for two-thirds of its BCs at post offices, Banco Postal bears no fixed costs (it paid R$ 200m for the franchise). The fixed infrastructure and staff costs are all borne by the postal company.

For Lemon Bank, the strategic challenge is converting transactions to clients. The bank estimates that it handles 5 million transactions per month, for 1.5-2.5 million individuals. However, it only has 16,000 active current accounts. Will an infrastructure that only handles bill payments have a strong future if other BCs nearby offer the full range of services?

Third, as it becomes harder for banks to attract new customers, and once the novelty of the BCs wear off for rural and low-income communities, banks will have to invest more in financial literacy training, marketing and other customer segments. For example, adding more acquiring devices (EFTPOS) in the communities will increase the number of e-payment transactions that take place, make it more attractive for customers to hold debit cards, and possibly bring in merchant accounts. Banks could also focus on business customers such as suppliers and wholesalers in these areas.

## Operational Challenges Are Still Trying To Be Being Solved

Two important challenges must be solved if the delivery channel is to work, especially in distant communities:

First, banks must figure out how to manage cash liquidity and risk at rural BCs where transport of cash in and out is difficult or impossible. If there isn't enough money at BCs to give pension-holders their cash, or customers cannot deposit money because the BCs have too much cash on-hand to accept any more transactions, the system will quickly lose credibility. In addition, frauds have occurred and some banks have had to scale back some of their BC networks.

Second, customer adoption is still an unsolved problem– Banco Postal reports using staff from the postal company to go out and educate customers about why bank accounts are useful.

## Questions

Finally, there are a number of questions that only time will answer:

- Can e-payment channels fully replace all aspects of branch banking for currently unbanked? And in the long term, can these channels achieve profitability and ensure consistent service despite being operated by independent third parties on the banks' behalf?
- In villages where banks only find one viable retail partner to deliver services, are customers doomed to a local banking monopoly?
- Will banks ever be able to service the very poor and illiterate through third parties?
- Finally, how will specialized microfinance institutions react to banks that develop banking correspondents in their backyards?

# Extending Banking to the Poor in India

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*The paper articulates the key issues in extending banking to the rural and poor populations in India. Banking is viewed in a new perspective with the advent of new technology consisting of two main elements: cash management and management of databases. Recommendations are provided for solving regulatory issues that impede the process of banking and suggests including the development and implementation of nationwide standards for smart cards, suitable changes in the RBI guidelines regarding smart cards, Government leadership in encouraging the adoption of smart cards and related technologies, and undertaking specific initiatives to provide an impetus to rural banking. The implementation of these guidelines may serve as a catalyst to the banking sector in extending operations to reach the rural populations and the poor through innovative cost-effective mechanisms.*

## Introduction

Access to financial services is essential to the poor. Financial services enable the poor to maximize the returns on their surplus, smooth their consumption and reduce their vulnerability to risks that they face on a day-to-day basis. They use various forms of financial services to meet their needs. They borrow not just for productive purposes like businesses and agriculture but for a number of consumption purposes. They make savings both in the form of cash and in the form of assets that they may liquidate at a future date. While small loans and savings provide timely relief to them and help them to cope with sudden income shocks or emergencies; loans and investments can be utilized for diversifying income sources and for investing in existing businesses to increase revenues and scale of operations.

With a population of over a billion, India has nearly 350-400 million poor people. This amounts to nearly 75-80 million households. Studies have indicated estimates of the outreach of the formal financial system. Data from the All India Debt and Investment Survey 1992 indicates that the share of the non-institutional agencies (informal sector) in the outstanding cash dues of the rural households is as high as 36%. The desegregation of this data further reveals that the credit dependence on the informal sources was higher in the case of lower asset groups. The dependence on the informal sector was as high as 58% for households with assets lower than Rs. 5,000. A study by Price Waterhouse Coopers in 1997 however indicates that the dependence of the low-income households on the informal sources is as high as 78%. Most of the poor do not have access to the banking system for the purposes of savings as well. According to Mahajan, the transaction costs of savings in formal institutions were as high as 10 per cent for the rural poor. This was because of the small average size of transactions and distance of the branches from the villages. As a result a large number of the poor depend on the informal mechanisms of saving like chits, bishis, matkas, savings with local traders and merchants and savings with deposit mobilization finance companies (Non Banking Finance Companies). Some of the finance companies may be unregulated and result in fraudulent operations. According to a survey in a Delhi slum, 55 per cent of the slum dwellers had lost their money to one or the other finance company.

As a result of the low access to institutional (formal) sources of financial services, the poor access informal sources. Also, a fact to be noted is that the dependence

on informal sources increases with the increase in the level of poverty. Informal systems may be inefficient and even exploitative due to their monopoly power. Interest rates in the informal market vary from 3-10% a month. Vegetable vendors are known to borrow at even 10% a day to finance their daily working capital needs. The poor who save through informal mechanisms, face high risks in their precious savings. Many of the forms of savings, especially, savings with local merchants and traders are reported to have a negative interest rate.

Providing the poor a reliable, secure and rewarding mechanism to save will prove to be a very important measure in equipping the poor to reduce their vulnerability. Similarly, access to timely credit at market rates of interest is important for building better livelihoods of the poor. These requirements essentially indicate the need of the poor to 'bank'. Financial services of the required nature can be provided at scale through the mainstream financial system. The mainstream-banking sector is capable of providing a secure savings channel and returns by deploying funds in the financial market. In this manner, banks will benefit with increased liquidity by accessing a largely untapped market and the poor would be able to access the mainstream financial market and reap the benefits of accessing timely, reliable and secure financial services.

## The Key Challenges

In rural areas, banking acquires a different flavour. The density of population is far less compared to the urban areas and the size of transactions is also much smaller. Traditionally retail banking in India has been built around extensive infrastructures of branches and extension counters staffed with employees. In India, the scheduled banks have an outreach of nearly 32,600 rural branches. This is nearly 50% of the total branches in the country. One of the reasons for a high ratio of rural branches is to cater to the large rural population. Yet, as mentioned in the earlier section, perhaps the outreach has not been significant enough as a large number of the poor still depend on informal sources of savings. Perhaps, distance from the branch and the inconvenience of the branch timings influence the exclusion of the poor from the banking sector. Out of the 428.0 million deposit bank accounts in the country, 30% are in the rural areas. With a rural population of 741.6 million, the rural penetration of banks with respect to deposit accounts is as low as 18%.

While there is a pressing urgency to reach out to the rural population and increase the penetration, a few key issues in extending banking operations must be borne in mind.

### *Cash Dominated Low Value Transactions*

In rural areas, the transactions between various parties (banks, traders, input dealers, and farmers/consumers) are predominantly cash based and are very low in value. In this regard, it is interesting to note that bank loans up to Rs. 25,000 constituted 89% of total number of loan accounts of rural branches involving hardly 12.5% of total loans outstanding as on end-March 1998. The cost of cash based transactions is higher as compared to electronic/non-cash based transactions. It is because of the following additional costs involved:

- Cost of idle cash: Idle cash, lying either with the bank branch, a merchant or a consumer, does not earn any interest and the party holding it has to bear the cost of interest lost. Thus higher the idle cash, higher the cost of lost interest.
- Cost of cash handling infrastructure: It includes cost of branch set up, cost of manpower and the cost of cash security. This cost increases with decrease in value of transaction and decrease in denomination of currency transacted.

According to estimates, aggregate of all these costs is about Rs. 50 per Rs. 1000 of cash (i.e. 5% of value). Even in Finland, the cost of cash handling for minor payments is as high as 15% of the value of the transaction. Similarly, according to estimates the cost of servicing a transaction is estimated at $1.08 for a branch, $0.54 for telephone, $0.28 for PCs (ATMs) and $0.13 for the Internet. In India, the experience of ICICI

Bank also confirms that transaction costs can be significantly reduced if transactions are moved from branches to ATMs, call centre or the Internet. The transaction cost for a branch is estimated at Rs. 34 ($0.68), Rs. 28 ($0.56) for call centre and Rs. 20 ($0.40) for an ATM. Acknowledging this fact, ICICI Bank has leveraged these new technologies to move transactions away from the branches. Thus, the cost of transactions reduces with a decrease in the manpower intensity. There is also an increase in the number of transactions that a bank branch can handle with an increase in cash-less transactions. This increases the capacity utilization of the bank branch and increases its profitability. Thus, the challenge for banks is to eliminate cash based transactions.

### *Large Geographical Spread of Customers in Rural Areas*

In rural areas with a high percentage of the poor the nature of banking transactions involves low values and high volumes. The poor have the capability to engage in micro-savings and would require withdrawals at their convenience. The timing of these transactions does not necessarily coincide with bank branch timings. In such a scenario, at times it becomes a costly proposition for rural people to forego a day's income and instead go to a bank branch during the day to carry out the banking transactions. Typically, in the case of daily wage earners, transacting with a bank, which is at a distance from their residence would mean loss of wages for that day apart from the transaction costs of the visit. In such a scenario, the rural poor would prefer to avoid the banking transaction with conventional bank branches and instead use the services of a local moneylender/trader. The rural population requires banking services that are available at its doorstep and are also flexible in terms of the timing of undertaking the banking transaction in order to minimize the transaction cost of the customer. If the current structure of bank branches were to be used to cater to the need and requirement of the rural population, it would mean setting up a bank branch in virtually every village. The cost of such a large network would not justify the revenues generated from it, given the nature of transactions. Thus, the challenge for banks is to innovate a low-cost branch network/delivery channel with a high outreach and flexibility with respect to the timing of its operation.

Thus, the two key challenges that must be overcome to extend banking to the rural and poor population are:

- Elimination/ reduction of cash handling
- Innovation of low cost delivery channels

## Addressing the Key Challenges

In this section we explore the issues that the banking industry and service providers face in overcoming the challenges discussed above.

### *Elimination/Reduction of Cash Handling*

Banking could be viewed in terms of two critical components: Cash handling and database management. Conceptually, banking comprises database management for completing the transaction between account holders, for risk management and dispensation of money (physical money or e-money). The challenge in extending banking to the rural areas and to the poor is to manage the two elements to deliver maximum utility to the customer and the bank.

The new economy has delivered value to all stakeholders that have been able to access the services under its ambit. Computing, digital transfers of data and communication and the Internet have been the building blocks of the new economy. A challenge for the banking industry would be to harness the potential of the new economy by effectively deploying it for achieving the objectives set forth - of reaching the rural population and the poor and of delivering value to the entire value chain including the banks and its clientele.

A product of the new economy is the Smart Card that has the potential to replace cash and cater to the needs of data management. By combining the features of a

handy credit/debit card with the advantages of a micro-processor with a storage capacity of its own, the smart card provides secure identification, a store of value and an ability to function off-line while maintaining an audit trail of all the transactions.

A cash-less or a near cash-less economy can be envisaged with smart cards playing the role of secure stores of value or e-wallet/purse and transaction terminals for both loading value on smart cards and as point of sale (POS) terminals. The financial service providers will have to act in tandem to provide interoperability to the client and the applications on the smart cards will have to span a wide range of services to have a universal appeal. Essentially, every player in the system will have to be co-opted to use the virtual currency that the smart cards carry to achieve a cash-less system.

Though cash has not been totally eliminated from the systems, there are success stories internationally that demonstrate the path in achieving the objectives of cash elimination. These case studies have been discussed in the subsequent section.

For the implementation of smart cards on a nationwide basis and the creation of a cash-less economy, certain key issues will have to be addressed:

1. **Development and implementation of standards:** Essential to the operation of any smart card system is the need to have a common code or standards that are followed by the entire universe of vendors, operators, service providers and users. It is possible to operate a system deploying smart cards, which provide specific applications within a closed loop. However, to scale across the network of service providers and vendors, a common code of standards have to be implemented. The benefits of this technology can be maximized with the universal use and acceptability of the smart card.

   Specific standards are required for:

   - Operating Systems of the smart cards
   - E-Purse applications
   - Message formats/protocols facilitating communication between cards and service providers

   Technical standards have been developed by both International Standards Organization (ISO), and the VISA and Master Card networks (EMV). Such or similar standards need to be developed/adopted and prescribed on a nationwide basis. Similarly, specific standards for business applications (e-purse) need to be developed and accepted by the providers of the business.

   The SMARS Project based in IIT Powai issued standards in mid-1999. These standards did not find the mass scale acceptance that was required. The standards need to be updated with perspectives of all the financial service providers, the regulators and convenience of the consumers in mind.

2. **Interoperability:** Interoperability of smart cards is a must for the applications to find a universal appeal. Banks across the board need to make their systems not only compliant with the technical standards but also interoperable across other banks' systems. This will result only if there are commonly known and accepted codes that will ensure interoperability.

   The Reserve Bank of India (RBI) released its guidelines governing the issue of smart cards on November 12, 1999. While the guidelines are a step forward for the banking industry, a number of issues emerge which need to be resolved:

   - Eligibility of Clients: Annexure I of the RBI guidelines defines the eligibility of the clients who can be issued smart cards. According to the guidelines, banks should issue the smart/ debit card to its customer having good financial standing and who has maintained

his/her accounts satisfactorily for at least six months. Such a clause severely restricts the ability of a bank to provide specialized services to its customers especially those in the low-income groups as these customers will necessarily have to maintain accounts for six months before being given a much more cost-effective smart card solution. Such restrictions mar the spirit of innovation in new product development.

- Loading of value: The section on cash withdrawals does not permit the withdrawal of cash or deposit through a POS terminal. This means that all facilities of loading value on smart cards must be housed within bank premises. Such a restriction imposes restrictions on the growth of the terminals. Today, technology enables the loading of value not just through POS terminals but also through direct transfers from the bank account of the customer via the Internet. Thus, there is a potential to convert a simple Internet enabled desktop computer to a cash withdrawal terminal.
- Similarly, deposits can be made only in bank premises. In the scenario where virtual currency is being used, it becomes essential to provide the customer the facility to transfer value from his wallet (the smart card) to her/his bank account from a location that is convenient and cost-effective. The conversion of cash to an electronic equivalent stored either in the customer's account or her/his smart card is an important feature. POS terminals can be used to load value to the smart card. If the banking system is to extend banking to the rural poor, it must be able to do so cost-effectively. Building branch infrastructure for the purpose of mobilizing deposits may be a futile exercise especially when technology provides cost-effective solutions. POS/handheld terminals under suitable supervision can be enabled to accept cash and deliver an equivalent value in a smart card. Such a facility does not only lead to a reduction of cash management, but also provides the poor an opportunity to save their monies in a cost-effective manner.
- Written record of transactions: The section on security requires the issuing bank to provide written records of the transaction made either at the instance of the transaction or through a regular report. While this is desirable from the point of view of communicating to the client, the nature of the transactions (low value - high volume) may make the provision of written receipts/reports a very expensive activity. Further, the use of digital signatures, secure systems and on-line reports may make such reports redundant.

### *Adoption of smart cards and related technologies*

Despite the advantages that new technologies may offer the costs of cards and terminals may keep usage to very low-levels. Further, merchants may perceive usage of cards as a reduction in their margins. As a result, wide-scale usage of these technologies may not emerge. Credit card usage is at nearly 0.5% of the population in India.

Apart from the direct costs of new technologies, taxation and import duties too can inflate costs and make new technologies unviable. Simple cash dispensers that provide a facility to withdraw cash only are a case in point. While automatic teller machines (ATM) have a customs duty of 60%, their cheaper avatars (Cash Dispenser), which have the potential to reach out to the mass market have a customs duty of 150%. This inflates the price of the Cash Dispensers making ATMs a more cost-effective option. With reduced duty structures, the Cash Dispensers could be imported for as low as Rs. 0.3 to 0.4 million. An ATM costs nearly Rs. 1.2 million.

Research in low-cost devices and infrastructure is needed to boost the industry. The Government and the RBI must look for ways to provide incentives for the users, merchants and service providers to adopt new technologies. The Government can treat investments in such technologies as investments in infrastructure. Thus, the Government and its agencies could provide

POS terminals and ATMs that could be used by a network of banks, merchants and customers in rural/remote locations. While the users would gain from the network effect, the Government would have the potential to expand its tax net and decrease budgetary deficits.

### *Innovation of low cost delivery channels*

The advent of technology provides an opportunity to redefine the delivery mechanism of basic banking services of deposits and withdrawals. With the intervention of technology, any agency or a collaboration of agencies capable of carrying out these two activities can deliver banking services. In such a scenario, the existing banks that have the capability of database management can collaborate with other institutions/associations having large outreach in rural areas as the delivery channel. This will avoid the duplication of creating a new delivery channel and the saved costs can be used in enhancing the capability of database management, designing new products and strengthening the existing delivery channel. To provide basic banking to the poor one may have to explore the use of ATMs and innovations in the area of product design and delivery channel. We have highlighted some of the key issues in the area of extending low cost banking to rural population:

- **Collaboration with non-bank institutions:** The conventional structure of bank branches has higher costs as mentioned above. At the same time there are non-banking delivery channels with a high outreach, low cost and higher flexibility in terms of operations. Adopting such channels would require banks to partner with outside institutions, agencies or formal societies to deliver banking products. The current RBI guidelines, via circular no. DS (PCB) CIR.19/13.01.00/2000, do not permit the use of any individual, firm, company, association, institution or any other person for collection of deposit or selling of deposit linked products on remuneration or commission basis. Thus, banks cannot partner with any outside agency and have to set up their own conventional branch networks to reach out to rural and poor populations.

- **Restricting use of ATMs for rural areas:** Given the low cost of ATMs, as compared to setting up a branch, it can be the most suitable delivery channel to provide basic banking service of deposits and withdrawals to the rural population. However, uneducated rural customers would require assistance to operate the ATMs. The RBI circular no. BP.BC.60/21.03.051/96 specifies that “no person other than the security guard should be posted at such "non-branch"/"stand-alone" ATM centres”. Hence, banks cannot deploy an employee or an agent working on contractual basis at ATMs to assist the customer using it.

- **Restriction with Service Area approach:** According to RBI circular no. BL.BC.68/C.168 (64D)-91, new banks planning to establish a branch in the rural area have to take an approval from the lead bank and District collector of that district. Thus, service area approach may lead to reduced competition in rural areas as the lead bank may restrict the entry of new banks.

- **Deposit rates are not market driven:** Given the limited options available to the rural and poor populations for keeping its savings, the availability of a safe bank account may be more important for it than the interest rate earned on it. According to RBI circular no. DBOD.NO.DIR.BC.104/13.03.00/20 banks can not discriminate in the matter of interest paid on the deposit between one deposit and another deposit, accepted on the same date and for the same maturity profile in the same or different office of the bank, for deposits below Rs. 1.5 million. The guideline restricts the ability of banks to pay variable deposit rates on the deposits accepted in locations with different cost of operations and hence in some locations providing banking services

becomes unprofitable for the banks. This may discourage banks to set up presence in rural areas where cost of operations is too high.

## Recommendations

Low cost banking can be provided by large banks whom the have the capability to implement new technology based solutions. However, some of the issues that we have discussed above will need to be resolved with initiatives from the highest levels for concrete changes to emerge. We recommend that the following initiatives be taken by the Government and the RBI to give an impetus to cost-effective and value added rural banking:

- **Development and implementation of nationwide standards for smart cards including instructions on interoperability:** Standards for technical operations (including operating systems for smart cards), business applications and interoperability are a must for any significant progress to be made in this direction. While all banks, major service providers and vendors must be involved in the process of development of standards, a central authority can lead the way by taking the initiative.

  We thus, recommend that RBI take a lead in the formation of standards by bringing together all banks, financial institutions and important stakeholders in one fold and guide the creation of standards that address technical and business issues as well as the key question of interoperability.

- **Changes in the guidelines covering smart card issue:** Along with the development of the above-mentioned standards, the guidelines too must be modified keeping in mind the rural and in some senses a remote market segment. Hence, this must be done with a keen understanding of the Internet and the possibilities that it brings. In this regard it may be useful to study the key initiatives adopted by some of the central banks and governments internationally.

Specifically, we suggest that a few of the clauses of the guidelines be revisited:

- **Eligibility of Clients:** Banks should be allowed to issue smart cards to customers without a bank account or a history of savings and credit servicing. Such measures allow banks to reach out to the poorest of customers who - in a majority of cases - would have no banking history.
- **Loading of Value:** Smart card holders should be allowed to load value on the smart cards via the Internet. Another approach that the RBI could adopt is to allow banks to upload value on cards through terminals co-owned or licensed by banks and not necessarily housed in their premises. The implications of this would be that low-cost terminals and kiosks could serve as cash dispensers. Thus, the rural poor will be able to reach the bank to withdraw their savings without actually having to traverse the physical distance. Similarly, the guidelines must permit clients to transfer value from their cards to their bank accounts through the Internet. Further, cash deposits must be accepted either through third parties appointed by the bank or through employees of the bank at a location, which may not be a branch. In other words, specific terminals must have the capability to accept cash and convert the same to a virtual currency. The security of the cash transactions including the risks of appointing the agent, must be borne by the issuing bank.
- **Written reports and receipts:** Though banks should attempt to provide receipts of transactions to its customers, such a condition should not be a compulsion on the bank especially when the bank is attempting to service large number of rural clients. Typically, in a project that aims to reach the poor, the banks should attempt to provide services (cards) to a very large number of very poor clients. The nature of the transactions would be of a very low

value and of a very high volume. The provision of written/printed statements would not be in order here as it may render the project unviable. The bank would need to provide confirmation of the transaction, but we suggest that the bank be given the flexibility to choose the medium of this communication. This may range from an e-mail accessed through kiosks or an Internet banking account with appropriate certification.

With regard to the above-mentioned recommendations, it is important to mention that significant progress has been made in ensuring the security of transactions. The concerns of the regulators with respect to fraud must be seen in the light of experience in France where the fraud rate fell from 0.27% to 0.026% while the volume of transactions increased from Euro 20.0 billion to nearly Euro 150.0 billion from 1987 to 2000.

- **Encouraging the adoption of smart cards and related technologies:**
  - Lowering of costs is an important step towards increasing the implementation of the required infrastructure to enable the usage of cards and a virtual currency. The Government can give concessions on the excise and import duties of related equipment. If the customs duty here is rationalized or waived, much cheaper cash dispensing devices will be available to the public. Further, important infrastructure like ATMs could be made customs free. Such measures will allow small rural banks too to deploy ATMs and provide more cost-effective services to the poor.
  - The Government must invest in research in technologies that will provide the potential to extend in a cost-effective manner is important services to the poor.
  - The Government also needs to invest in the creation of infrastructure that can be utilized by network of banks, merchants and the poor alike. Such infrastructure may consist of ATMs, POS terminals and smart cards issued to the potential users especially the poor. The National Bank for Agriculture and Rural Development (NABARD) could deploy such infrastructure as part of its programmes to extend the reach of financial services to the poor in rural India. On the other hand, the Government could provide income tax concessions to banks investing in IT and infrastructure for their operations intended to reach both rural and poor populations.

- **Allowing appointment of third parties for banking:** Banks can collaborate with third parties acting as agents to expand their outreach exponentially and provide doorstep banking to the rural population. The risk of any default by the agent must be borne by the bank. New technologies of cash handling and data capture would provide a complete audit trail of the transactions and minimize fraud. We recommend that the RBI make suitable changes in the regulations to allow banks to collaborate with outside institutions, formal societies, associations, firms and individuals to use their rural outreach as the banking delivery channel. The nature of collaboration could be defined to address the concerns of control and monitoring of these outside parties.

- **Allowing variable interest rates on deposits:** In a scenario where the transaction costs of providing banking services is high, it may be a better business proposition for the banks to pay a lower interest rate than paid by the bank otherwise for deposits of the same maturity profile. The current RBI guidelines do not allow a bank to differentiate the interest paid on one deposit versus other deposits of the same maturity profile. If a bank is to provide basic banking services to the poor, one must account for the high costs of operations. We recommend that RBI allow banks to pay a variable interest on deposits depending on the cost of servicing the particular type of accounts.

- The current guidelines on ATMs do not allow the presence of any persons apart from the security guards. The E-Plan model of South Africa demonstrates that the utility of an assistant who could guide the poor, often illiterate users, to use the ATMs results in high usage. The users were provided a card to block their accounts in case there were chances of misuse. Similarly, in India too, such flexibility must exist especially for kiosks and ATMs meant for usage by the poor. We recommend that the RBI may consider suitably modifying its guidelines.

- The current service area approach of serving the rural area may require thinking with a perspective of encouraging competition in the rural areas and improving the customer service level. The regulations should be suitably modified so that banks may be allowed to compete with existing banks by innovating the provision of financial services.

- The Government can also address some of the larger issues to make a significant impact in the field of financial services for the poor. These include provision of stable and reliable electricity connections to rural areas and the creation of communications infrastructure like laying of optic fibres, telephone exchanges and providing shared VSATs where required. At the same time, we have highlighted a few key steps that the Government could undertake to give an impetus to rural financial services:
  - Computerization of operations of banks especially the rural operations: The RBI can provide instructions to all banks to undertake the computerization of their operations with a specific timeline.
  - Land Records Computerization: While a few states have made advances in this direction, many more need to follow suit to make important documents such as land records accessible to both bankers and farmers.
  - Networking of Post Offices: The Postal Department in India provides immense possibilities of outreach through a delivery channel larger than that of the banks. Effectively networking the post offices will provide greater potency to this delivery channel.

## Conclusion

The advent of the new economy necessitates revisiting our understanding of banking and our perception of delivery mechanisms. Sharply defining banking in terms of management of cash and database management provides a keen insight into alternative ways of extending banking services to the poorest. However, the new mechanisms that deploy the new age technologies such as Internet and smart cards will not be effective in the true sense unless certain key changes in the policies and regulations governing their implementation are made. Further, necessary steps need to be taken to bring the banking community to a common platform through which mass scale usage of banking services can be achieved. The RBI and the Government must lead the way by taking the necessary initiative and by suitably modifying the policy and regulations. A pilot experiment may be undertaken that incorporates the suggestions and tests their feasibility. Once found feasible, the suggestions can be included in the relevant RBI guidelines and can be supported by the Government of India.

It appears that the transition from cash based to cash-less transactions will happen in phases over a period of time. As the transition happens, the nature of the delivery channels required may also change from being manpower intensive to low-manpower intensive channels and finally to manpower free channels. In the final phase that of a cash-less economy the role and profile of delivery partners will also change.

Lastly, it is interesting to view how some of the suggested changes may go a long way in influencing the existing schemes of the Government like the Kisan Credit Card. Once the necessary regulatory changes

have been effected, banks could actually issue smart card based credit cards to farmers with a pre-loaded value. The card could be used at merchant outlets where it will be possible for the farmer to procure inputs for his/her fields. The bank and the merchant would benefit not only from the reduced burden of cash handling but also by being able to closely monitor the usage of the loans provided. The farmer in turn will be able to use the smart card to make daily deposits at locally available POS terminals serviced by the bank, purchase insurance products for his/her crops and family and repay his/her loans on-line or through an automated system. The farmer could also apply for new loans, which could be loaded onto the same card. The bank could maintain a credit history and a savings records of prospective customers from the cards issued to them previously by other banks and make prudent decisions about lending far more efficiently. Hence, not only will the business of the bank improve but the farmers too will be able to enjoy the value added Kisan Card.

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# Remittances, Microfinance and Technology

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*This paper discusses migrant remittances in the Sri Lankan context, specifically in relation to Hatton National Bank's (HNB) microfinance program and the use of technology. First, a brief overview is provided on Sri Lanka's socio-economic status, microfinance history and the HNB and its involvement in microfinance. Currently outreach in microfinance is expanding as a result of migrant remittances, improved technologies and cheaper services. HNB's innovative remittance e-product, Money2Home, is one such product outlined and other future development areas are considered. The Gami Pubuduwa (HNB's Microfinance) scheme specifically addresses the new program being pursued. The scheme's achievements can be attributed to the nature of its operations and an understanding of the customer's requirements.*

## Background

### *Socio-Economic Overview of Sri Lanka*

Sri Lanka has an estimated population of 19.4 million. The estimated average annual population growth rate is approximately one percent, which is well below most countries in the South Asia region. Sri Lanka has been in the process of liberalizing its economy for a quarter of a century and at present the economy has grown at a rate of five percent over the last decade. This growth is largely due to reasonable macroeconomic management and progress in trade liberalization, privatisation, and financial sector reform.

Sri Lanka is generally recognized as more advanced in terms of human development in comparison to other states with similar levels of economic development. Its literacy levels, access to basic health care and access to education are all above South Asian averages.

However, Sri Lanka's development continues to remain below its potential capacity. Ethnic conflict has exacted a heavy price on the country's overall performance as is evident with persistent poverty in the Northern and Eastern regions, in the tea plantation areas, pockets in dry zone areas and in urban slums. On average twenty five percent of the population lives in conditions of poverty, predominantly in rural areas and often without access to basic utilities.

### *Microfinance in Sri Lanka - Historical Overview*

The establishment of the Co-operative Rural Banks in 1964 was the most significant contribution of the government to microfinance since independence. New initiatives implemented by the government since 1964 have included the establishment of the Regional Development Banks in 1986, the Jansaviya Trust in 1990 and the Small Farmers and Landless Credit Project in 1991.

This period can also be considered as the start of major NGO involvement in microfinance, which commenced with the establishment of SEEDS in 1986. The next most significant step was the establishment of Samurdhi Authority and its microfinance program in 1997.

Today microfinance in Sri Lanka is, by and large, an unregulated sector. Despite the massive growth of micro finance in Sri Lanka, over the last fifteen years there has been no attempt to regulate the institutions providing this service. The key reason why regulations are required is due to the vast amount of savings that the poor entrust to these organizations.

### *Hatton National Bank Profile*

Hatton National Bank (HNB)was established in 1888 to cater for the flourishing tea industry in Sri Lanka. Subsequently the Bank amalgamated with National & Grindlays Bank in 1970 and incorporated into HNB.

In the past, through internal growth and acquisition of the Colombo Branches of the Mercantile Bank, Emirates Bank, Bank Indosuez, Habib Bank and A G Zurich, HNB has risen to become the largest private sector commercial bank in Sri Lanka in terms of advances, deposits and total assets.

Currently, the Bank has a network of 142 customer centres, 152 Microfinance units, 152 Student saving units and two representative offices in India and Pakistan. Today the bank has an asset base of Rs 120Bn and commands a significant market share in many core areas of operations. Importantly, the Bank also has the second largest foreign currency remittance deposit base amongst all of the domestic banks.

HNB provides a broad range of financial services including Corporate and Retail Banking, Trade Finance, International Banking, Corporate Finance, Leasing, Project Financing and Micro financing. Other ancillary financial services provided by the Bank include Insurance, Investment Banking, Stock Broking, and sale of Gold and Margin Trading facility in shares.

### *HNB's Involvement in Microfinance*

A key achievement of HNB is located in the rural areas of Sri Lanka in HNB's Gami Pubuduwa (Village Awakening) microfinance programme. In keeping with its name the programme has provided a new lease of life to over 50,000 rural families. During the process, it has redefined the concept of micro financing and emerged as a model of sustainable development.

Gami Pubuduwa (HNB's Microfinance) was launched in 1989 in the backdrop of an insurgency led by unemployed youth. The bank developed this program to provide an avenue for the rural population to gain access into the formal economy. It was believed that it could assist with social progress, and a focus on customer care has managed to turn things around.

Gami Pubuduwa (HNB's Microfinance) has emerged as a profitable banking model and the bank is now poised to expand it to new levels of growth. HNB has now been fully integrated the program into its regular commercial banking operations.

HNB has always been driven with a sense of social responsibility. The ascent on taking banking to the poor may result in bigger operational costs and lower returns but HNB knows that to move forward, the country's predominantly rural people must be brought into the formal economy.

## Project Description

### *Expanding Outreach of Microfinance*

For an island so naturally blessed, over two million of its people (ten percent of the population) have either migrated elsewhere or remain as migrant workers. Migrant worker remittance is today the country's highest foreign exchange earner. Nearly sixty percent of migrant worker remittance comes from rural Sri Lankan women who have been working abroad and have assumed as the dominant breadwinner of the family.

As the second largest receiver of foreign remittance, HNB's vision is driven by a passion to bring people from rural areas into the formal economy. The bank has established strong ties with rural communities and its branches continue to serve as centres of growth in under-developed areas.

HNB staffs are trained to reach out to the poor and to extend to them, the very tools of progress that Gami Pubuduwa (HNB's Microfinance) has extended to countless Sri Lankans. HNB's microfinance program is an investment in each individual, beyond traditional money transfers.

### *Improving Access to Remittances through Technologies*

Technology solutions are the current frontier in remittances. Enabling remittance transfers and payments using technologies such as the internet and mobile phone holds considerable promise for increasing access to improved and less costly services for remittance senders and receivers, including those in remote or under serviced areas.

The linking of services and technologies in new ways has emerged across the globe, enlisting new names and increasing competition in a market originally dominated by a few service providers.

### *Greater Outreach and Cheaper Services*

A significant structural impediment to the growth of remittance services is the lack of an integrated operational and technical infrastructure. This infrastructure must include fund collection mechanisms, bank accounting system integration, regulatory compliance, foreign exchange currency conversion, distribution, and settlement.

The remittance industry is composed of money transfer companies, financial institutions, and web portals that operate within closed networks where money transfers are confined to their sending and receiving agents or partners

Banks that have invested in the required infrastructure to launch remittance services suffer from weak distribution, mostly as a result of offering only remittance delivery to banks within their existing correspondent network. Smaller banks have few alternatives for delivery products and use traditional money transfer company partners that lack banking integration and distribution systems beyond their partner agents.

### *Remittances via Internet*

A more recent and rapidly expanding money transfer service uses the internet to offer mostly online-to-offline transactions. The sender processes a transaction over the internet using either a credit card or bank account number or through an appointed agent, and the recipient collects the payout through traditional mechanisms which include: cash payouts, bank accounts, or debit card accounts. The reach from this type of transfer service will continue to expand but remains limited by accessibility to the internet and by the financial services infrastructure, such as bank branches and ATMs.

To provide effective remittance services the following factors need to be considered:

- Easy access to money agents
- Reliability of the provider
- Speedy service
- Reasonable cost
- Convenient access to payment services (bank branches, ATMs)

### *Remittance Service Provided by HNB*

HNB has developed an innovative e-product, the **Money2Home** remittance service. The **Money2Home** system transfers funds from any country to any designated account at any branch of HNB in real time. The striking feature of **Money2Home** is that the transfer can be done through the internet. The transfer can take place if one is a member of HNB's internet banking service, or by visiting an appointed money agent where clients can obtain the same service for a nominal competitive rate.

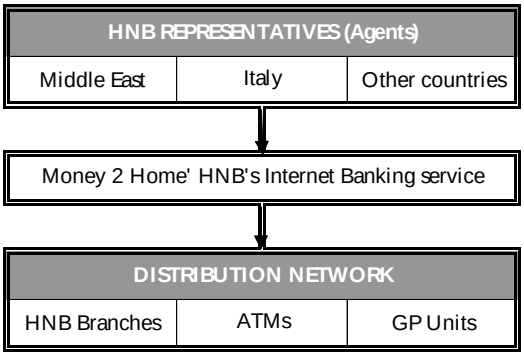
The IT Research & Development Division of HNB developed the Money2Home e-remittance system. This division has been successful in keeping the initial development costs to an extremely low level. This has enabled the Bank to offer a competitive pricing structure, which is one of the major concerns of an average migrant worker.

### *Basic Features & Operating Procedure*

Features of the service include:

- Maintaining money agent's accounts in different currencies by the bank.

- Maintaining customer accounts for regular clients by the agent.
- A magnetic card will be issued to the customer for easy identification & speedy service.
- Regular beneficiaries are identified and linked to the agents account in the system.
- Money agent will maintain daily currency rates.
- Non-account holders also can carry out transactions where the beneficiary is requested to provide a form of identification.
- System provides beneficiary details, currency conversion rate & commission amount when the customer account number is entered by the money agent. These features are expected to reduce the processing time at the money agent's end.
- Customer receipt and agent daily transaction details can be obtained through the system.
- Money agent could view the status of the transaction at the receiving end (confirmation that money has been received by the beneficiary).




### *Future Developments*

Future developments for the service are outlined below:

- When the money is received to the account the beneficiary can be informed through mobile SMS
- Customer could transfer funds online using Credit or Debit card through HNB Internet banking.
- Senders could make an online payment using a credit card, and the recipients will be issued with a debit or credit card. This card is reloadable or funds could be received in real time. Recipients can use the card to withdraw cash at an ATM or to purchase items at any card merchant.

## Results

Clearly, it is difficult to convert migrant workers with no prior business experience into dynamic entrepreneurs all at once. Thus it is more realistic to introduce other banking products that attract migrant remittances such as deposits and to channel them to existing small and micro-businesses.

Gami Pubuduwa (HNB's Microfinance) scheme plans to develop a new program that will give new orientation to the migrant remittance. The scheme will also encourage participation in self-employment activities by identifying the strengths, weaknesses and resources available and offer banking products as appropriate. This illustrates the far-reaching benefits of Gami Pubuduwa (HNB's Microfinance) and extending it to all segments of the community.

Gami Pubuduwa (HNB's Microfinance) scheme was formulated not only with a view of providing credit facilities but to also to provide a comprehensive banking services package. The main elements of the scheme are rural savings mobilization and social development through provision of credit. During its fifteen years of operation, the Gami Pubuduwa (HNB's Microfinance) scheme has assisted over 50,000 projects, amounting to Rs 3Bn, with Rs 1.1Bn presently outstanding and covering over 110, 000 projects.

Our island-wide network consists of 109 dedicated Microfinance units and 116 Microfinance field officers. As the network is the primary means for delivery of banking services to prospective clients, Field Officers play a critical and effective role. By understanding the entrepreneurial capabilities of the clients, Field Officers could design and develop banking services that properly address the client's requirements. These requirements continue to include structuring loans to fit the customer's needs and capabilities and providing financial advice and close monitoring.

Having been ushered into the formal economy the bank then could take on the continuing role of introducing Gami Pubuduwa (HNB's Microfinance) recipients to the broader vistas of small and medium-scale enterprises and then to larger investments based on the customer's progress and ability.

## Conclusion

Overall, migrant remittances in Sri Lanka are substantial and will continue to grow in the future. Harnessing the development impact of these flows with an efficient and effective remittance infrastructure is the challenge of today.

# Microfinance Needs a Common Platform for Access to Capital and Scalable Operational Systems

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*One of the key limitations of the microfinance sector is the lack of adequately flexible, extensible, and scalable software solutions. In a survey of MFIs conducted by the World Banks' Consultant Group to Assist the Poorest (CGAP), only 10% of MFIs report using a Commercial off-the-shelf (COTS) software system. This is despite the fact that there are over 50 software vendors serving the market.*

*To scale up microfinance, the industry needs a marketplace of interoperable systems to enable both connections to commercials sources of capital - through sophisticated data reporting - and connections to front-end systems such as point of sale devices and SMS based transactions. This should be enabled by an open source platform with the attendant commoditization for all vendors in the market that this entails.*

## *Technology for Microfinance*

Microfinance distinguishes itself from previous forms of financial services, not only by a focus on reaching those largely ignored by the banking sector, but by utilizing social capital at the local level to distinguish good business ideas from poor ones, through such mechanisms as group selection and formation. The field officers of these organizations play a larger role than the teller at the bank, visiting the borrower where they live – often in areas without power or any form of telecommunications. Microfinance Institutions (MFIs) also expect payments on a more frequent basis than banks, typically weekly, for very small amounts. This model is often equated with the Grameen Bank of Bangladesh model, but is actually used in various forms around the world.

As noted by economists Armendariz de Aghion and Morduch[1]:

> *Grameen Bank's Weekly group meetings have some obvious and simple advantages for the lenders and customers. Most immediately, they offer convenience to the villagers; the bank comes to them, and any problems (a missing document, being a few taka short) can be resolved on the spot. The bank thus offers the same convenience as a local ROSCA (savings and credit cooperative) or moneylender. Meanwhile transactions costs are greatly reduced by the loan officer since the multiple savings and loan transactions of forty people can take place in a short block of time. Transacting through groups also has more subtle advantages (and some limitations). In particular, the group responsibility clause of contracts can mitigate the moral hazard, adverse selection, and enforcement problems that crippled previous attempts at lending to the poor by outside financial institutions.*

Microfinance is thus far more than an uncollateralized loan product. Rather it is an approach to lending and other financial services (savings, insurance) that is designed to mitigate against various forms of risk, ensuring that trustworthy institutions can be built and continue to meet needs for decades to come. Low levels of portfolio at risk are both an artifact and an important element of the philosophy of carefully managing that risk.

Aside from borrowing, savings is a much underappreciated aspect of microfinance, with savings

[1] Beatrice Armendariz de Aghion and Jonathon Morduch, The Economics of Microfinance, 2005.

of clients with some institutions outpacing the demand for credit. Families seek to save for future life events (marriage, death), capital for small enterprises, and irregular household spending, and often lack any other options for trusted institutions. As microfinance institutions begin offering savings, many regulatory issues arise, and regulators often demand a level of reporting around savings that MFIs are challenged to meet.

The features of microfinance around group dynamics, field operations, reporting, and product design introduce technology design challenges, and, combined with the dynamics of a global but locally shallow market, make sustainable business models all but impossible for the typical software vendor.

Thus, although over fifty vendors now serve the microfinance market with databases and operational systems for managing portfolios,[2] according to a survey by CGAP, these vendors reach only about 10% of the total market of MFIs. Most MFIs have chosen to develop their own systems in-house or create a custom solution with an outside vendor. As a result, many MFIs have had to invest scarce resources into technology development and maintenance, and enormous duplication of effort continues to plague the industry.

These separate efforts to solve similar problems of operations extends also to front-end systems with the result that many prototypes exist for scaling microfinance but none of these solutions have yet scaled to multiple institutions across multiple countries. Working within the industry, the Grameen Technology Center (part of Grameen Foundation USA) is building a common platform for the industry and creating consensus around the need for data interoperability and front-end systems.

It is instructive to note that just as the financial services industry globally has often been a driver of new technologies, microfinance may also be a key driver in new global systems of connectivity and ICT innovation.

## Remote Transactions

A key component of the mission of the Technology Center, as a part of Grameen Foundation USA, is to promote solutions that could work for the entire industry. The Technology Center was a founding member of the Microfinance Team collaboration, an effort that included ACCION, FINCA, Freedom from Hunger, eChange, and Hewlett Packard. The technology solution that resulted from this collaboration is called the "Rural Transaction System" (RTS), and was implemented in Uganda in three institutions as a pilot project, using three different business models. The main lesson learned in this project was that redesigning your approach to service delivery goes hand in hand with new technology.[3]

Looking at the future of transaction systems, a key platform to consider is the fast growing mobile (GSM) phone network, SMS messaging, and widespread access to mobile handsets, a fact underscored by numerous organizations. As the Technology Center has experienced with the Village Phone project,[4] it is always easier to build on an existing platform. The combination of SMS, bio-identity technology, and the ubiquity of mobile handsets is poised to dramatically change how financial services are delivered to millions of people. In a model currently being exploited in the Philippines, a user may send a cash equivalent value person-to-person and use a neighbourhood store to turn the virtual payment into cash.

Key questions to ask with respect to such platforms are: To what extent can low value transactions remain only partly secure on the SMS platform? How can we creatively use bio-metrics with handsets? Can we swap

[2] See www.cgap.org/iss for a list
[3] More information about this project can be found at www.gfusa.org/technology_center/microfinance_automation/rural_transaction_system/
[4] www.gfusa.org/technology_center/village_phone/

out SIM cards for each individual while keeping the same handset using better form factors? Are there ways to leverage existing transfer technologies, such as remittances, on top of the telecom infrastructure? What should be the role of Point of Sale (POS) devices and ATMs in this new imagined network of encashment and transfer? What role do stored value cards have in this mix? What are the regulatory barriers and can they be lowered safely for the consumer?

## Data Interchange

One estimate has put the total capital needs of the microfinance industry over the next five years at more than $300 Billion (Meehan, 2005), reflecting the reality that 3.5 billion people on the planet have inadequate access to financial services. The importance and relevance of enabling data interchange between commercial sources of capital and the microfinance sector has thus been underscored in recent microfinance industry forums. While Microfinance Institutions (MFIs) have long understood the need for auditable accounting practices for both donors and regulatory agencies, the depth and breadth of information required by commercial sources of capital requires a closer look at the ability to segment and analyze portfolio information.

According to the World Bank's Consultant Group to Assist the Poorest (CGAP)[5],

> *Only a handful of microfinance providers currently include enough information to comply with International Financial Reporting Standards (IFRS) and industry-specific disclosure guidelines. Industry specific disclosure requires certain information in addition to that required by IFRS to permit a fair assessment of the profitability and asset quality of microfinance operations.*

For the commercial banking sector and other sources of capital, the format and type of data needed is dictated by its use. Whereas in equity investments, only summary data validating the strength of the organization and transparency about weaknesses is necessary, for portfolio securitizations, more complex data is required. As the industry grows in terms of the capital requirements and the sophistication of financing, the ability to communicate effectively and in the terms expected by the commercial sector will also grow in sophistication. There is a need, therefore, to enable standardized reporting from multiple MFIs to multiple sources of capital. IT professionals and Managers of microfinance institutions will need to recognize this need and push vendors and industry associations to coalesce around specific standards of data elements, quality, and transmission protocols.

Furthermore, rating agencies are currently hampered by the lack of standardized data or even computerized data from the institutions that they are attempting to audit and rate for financial investment. Data analytics in the microfinance field are consequently weak and bonded rating agencies such as Moody's or Standard and Poor's are rarely found in the microfinance industry.[6]

## Microfinance Open Source (Mifos)

High volume transactions, group solidarity lending, and field operations in poor rural locations all make microfinance a difficult market niche to support with commercial portfolio management and accounting products. However, as MFIs move to increase the scale of their operations, manual or spreadsheet-based systems cannot provide the accurate and comprehensive information they need. Moreover, as noted above, the need for a common platform upon which to build technology innovations and interoperability is acute. At the same time, open source values of grassroots involvement, distributed software development, and organic growth can be seen in microfinance.[7]

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[5] "Financial Transparency', Consultant Group to Assist the Poorest. 2004.

[6] These conclusions are part of a paper reflecting a broad needs-based approach to data standards available for download at www.gfusa.org/docs/technology_center/DataStandardsConnectingCommercialCapital.pdf

[7] The Case for Automating Microfinance Using an Open Source Framework is at: www.gfusa.org/docs/technology_center/GrameenOpenSourceCase.pdf

Wide discrepancies in functionality and remote rural installations endemic to the microfinance sector make reaching sufficient market share difficult for commercial vendors. To keep costs down, vendors often choose to use an easily available database system, which may not have the ability to scale up to millions of transactions. Furthermore, the technologies involved may not adequately address long term issues of interfaces with third party systems, which allow microfinance institutions to reach out to the commercial banking sector for the funds they need.

The Microfinance Open Source (Mifos) initiative being pursued by the Grameen Technology Center will provide the global microfinance industry with a universal, flexible and scaleable management information system (MIS) and a platform for data standards propagation to facilitate large-scale, sustainable microfinance using an Open Source Framework. Functionality includes client management, product definition, account management, banking-quality transactions, and cash management, with associated reports for field collection sheets, portfolio at risk, and integration with accounting. Flexibility around both group and individual accounts as well as features for tracking non-standard data – such as number of livestock owned – are some of the distinguishing features.

Under the Mifos business model, benefits can accrue to a wide range of market participants whereby increasing the capacity, standardization and information exchange possibilities between different stakeholders in the industry. MFIs, funding agencies, software vendors and other third parties such as banks, rating agencies, and regulators will all benefit from open source technology. The first release of the Mifos (http://www.mifos.org/) product is being developed by GFUSA as a way to enable greater automation in the industry while maintaining a healthy local vendor solution provider market.

An open framework is a key feature of Mifos. While the initial release of the product will be a high-quality, highly functional, robust platform, making the source code available to the industry will facilitate a faster delivery of platform enhancements (including new product modules and third party extensions) and localization (an MFI in Egypt will immediately be able to take Mifos and have it modified, incorporating the Arabic language and other local requirements, without waiting on a proprietary solution provider to reach this stage in its product lifecycle).

The Mifos platform leverages a number of technologies to ensure flexibility, scalability, and extensibility, including:

- Web based to allow for remote access in those countries where connectivity has improved sufficiently, while also allowing for local installations.
- Java-J2EE design paradigm to allow for easy localization, specific programming interface points, and swapping of database technologies on the back end.

Mifos will adapt according to market-driven demands, however following are examples of new products and service delivery modes for which the Mifos platform will have the flexibility to support:

- Credit line products
- In-house claims processing for insurance products
- Remittance payments to savings accounts
- New payment mechanisms such as SMS (“g-cash”) and rural transaction systems
- Integration of biometric identity technology

GFUSA is focused on building the open source infrastructure that will allow participation and contribution from developers around the world. This effort includes building the Mifos development environment, development tools, development and localization guidelines, ‘Central Support’ infrastructure and a governance framework. Initially, GFUSA will

continue to fill the core roles including providing product direction, functional and technical requirements. However the governance framework will be designed to direct a gradual re-allocation of responsibilities to a broader group of Mifos stakeholders.

The Technology Center has assembled a team of staff and volunteers capable of managing the complexity of the Mifos undertaking, leveraging years of experience with leading technology companies in the US. Outsourcing the first release to one of the most well respected outsourcing firms in India, Aditi Technologies, the Technology Center is seeking supportive partnership organizations for the global rollout of the Mifos product in 2006.

## Credit Bureau

Besides assisting MFIs in managing risk and over-indebtedness of clients, Credit Bureaus are a key part of the functioning of an economy. The portability of credit allows for the labor force to be mobile and seek out new entrepreneurial opportunities where they exist. The lack of portable credit histories, on the other hand, is a source of enormous friction in an economy.

From an article by economists Simeon Djankov and Caralee McLiesh,[8]

> *Where access to formal sources of finance is limited or cumbersome, new entrepreneurs face impediments to converting promising ideas into business operations, and existing firms are unable expand their activities. By contrast, countries that facilitate access to credit tend to have a more vibrant private sector that generates greater economic growth.*

Credit registries are known throughout the developed countries and nearly every adult is included, whereas in developing countries, credit registries include only a tiny percentage of the population.

The potential for microfinance in creating credit histories for a huge number of disadvantaged people in poorer countries is a huge benefit to the individuals and to the economy of those countries. While microfinance relies on the group methodology and loan officer contact to manage risk, as noted previously, credit histories offer an additional source of information to mitigate adverse selection. This is especially true for migratory populations in peri-urban settings, of which there is at least 500 million worldwide.

The challenges associated with institutionalized a credit bureau system are unique id, institutional arrangement, and data availability. As J. Isern noted in 2002: [9]

> *One potential bottleneck for credit bureaus in microfinance is the absence of unique client identification schemes, such as those based on national identity cards. Another challenge is the resistance of microfinance providers to sharing information, especially if they fear that competitors may "steal" their clients on the basis of such information. The incapacity of the management information systems of many MFIs to provide information on a regular and reliable basis is yet another challenge to the growth of credit bureaus.*

Relating back to the development of Mifos, the development or implementation of a Credit Bureau system cannot be de-linked from the development of a platform for portfolio and client information.

To explore these issues and gain a better understanding of the challenges of creating a sustainable business model for microfinance organizations, the Technology Center in collaboration with Planet Finance Morocco and the Microfinance sector in Morocco is developing a pilot software package for creating a credit bureau for microfinance borrowers. This innovative program, when fully implemented will allow poor borrowers in Morocco to establish a credit history and potentially move into the financial mainstream. In addition, the

[8] "Well-Functioning Credit Markets Boost Growth" World Bank discussion on credit histories and development. December 2003. http://rru.worldbank.org/Discussions/Topics/Topic25.aspx

[9] J. Isern, "Increasing Client Access: Credit Bureaus and Microfinance", 2003. Microfinance Gateway Article.

initiative will allow Morocco's MFIs to more closely track the loans they extend to borrowers and more effectively manage risk.

The pilot project leverages open source tools to allow the easy adoption of the Credit Bureau management application. Three large Moroccan microfinance institutions (MFIs) are currently testing the first release and have reported positive results. Morocco has a highly evolved microfinance sector, with 11 MFIs reaching more than 450,000 borrowers. After Morocco's business and technology model is tested, it will be offered to other countries seeking a similar credit tracking solution. For more information regarding the credit bureau concept and pilot, please reference: http://www.gfusa.org/technology_center/microfinance_automation/credit_bureau_pilot/

## Conclusions

GFUSA was one of the first in the field to recognize the role for information and communication technology in advancing microfinance, which led to the creation of the Grameen Technology Center in Seattle in 2001. Today, GFUSA is in a unique position to lead an industry wide initiative that will transform the delivery and effectiveness of microfinance. With a mission of leveraging the power of microfinance and technology, the Technology Center has been staffed with a team of experts in the field of software development and microfinance automation.

From its inception, Grameen Foundation USA, through its Technology Center has demonstrated an industry-wide approach and recognized the value of forming partnerships across the microfinance, public and private sectors to achieve a systemic impact. GFUSA played a key role in a Rural Transaction System (RTS) project which was a collaborative effort to experiment with field level automation. Together with partners in Morocco, GFUSA is working on a Credit Bureau system to ensure that the poor have the ability to develop a credit history and to help the MFIs with managing risk. With multiple MFIs, spread across different continents and utilizing different methodologies, GFUSA's work on the Mifos system expects to break new ground on creating a common platform for the industry.

The building blocks of a common platform should be related to the unique manner in which microfinance operates, and should take advantage of the many new technologies around connectivity that are being proposed and implemented. The role of local vendors should be strengthened while enabling a set of data standards that can be used globally.

## About Grameen Foundation USA

**www.gfusa.org**

Grameen Foundation USA (GFUSA) is a global non-profit organization that combines microfinance, technology, and innovation to empower the world's poorest people to escape poverty. Founded in 1997, GFUSA has established a global network of 52 partners in 22 countries that has impacted an estimated 5.5 million lives in Asia, Africa, the Americas, and the Middle East. The Grameen Technology Center, an initiative of the Grameen Foundation USA, was founded in 2001 to leverage the power of information and communication technology in the fight against global poverty.

## About The Author

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THE FOUNDATION FOR
DEVELOPMENT COOPERATION

# Electronic Banking with the Poor

## Conclusions and Recommendations

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Making financial services available to the poorest people is recognized as an important part of poverty reduction strategies. While increasing outreach has been the catch-cry for at least the last five years, the present delivery models are not quite meeting the challenge, especially when it comes to serving communities in remote locations. Technological innovation offers significant hope, although it will result in fundamental changes to microfinance delivery mechanisms as well as to the very role of microfinance providers and their relationships with other players in the finance sector, especially commercial banks.

1) The advent of the digital economy necessitates revisiting our understanding of banking and microfinance, and our perception of delivery mechanisms.

2) Few MFIs have a fully automated Management Information System (MIS); many use a combination of manual and automatic systems, and many others use manual systems only.

3) The potential of a fully automated MIS is that it allows an MFI to manage its loan portfolio better, increase efficiency, and enhance transparency and accountability at all levels. These are all vital and fundamental to the on-going maturation of the microfinance sector.

4) MFIs can easily extend the benefits of a fully automated MIS by implementing relatively simple ICT innovations that do not fundamentally alter their service delivery models (e.g. mobile computing solutions for loan officers).

5) Few MFIs are ready to take advantage of ICT innovations for service delivery, because their back-office MIS is below the standard and functionality required. Unless and until MFIs have a fully automated, functional and robust MIS that adheres to industry standards, it is premature for them to consider other ICT innovations.

6) Many MFIs attempt to develop their own custom MIS software. Cost constraints mean that these packages lack functionality and robustness, and are rarely transferable across different hardware and software platforms. This approach is sub-optimal for the microfinance sector as a whole, as we find that limited systems constrain institutional growth.

7) Necessary steps need to be taken to bring the microfinance community to a common standards-based platform, in terms of functionality and inter-operability of the MIS. This is vital if MFIs are to be integrated into the shared infrastructures that will inevitably emerge as the financial sector implements modern electronic banking platforms.

*We recommend that industry standards for MIS's be developed for the microfinance sector. These should be developed by a representative group of microfinance practitioners, banking systems experts and IT systems analysts. This would be the starting point for technology and software development firms, especially local vendors, to develop affordable, flexible, configurable, functional, and inter-operable MIS's.*

8) Many commercial banks *do* have a high-quality MIS in place and *are* able to take advantage of ICT innovations that will enable them to reach deeper into the "microfinance" layer. For this reason, it is fair to say that ICT innovations to deliver financial services to the poor are probably more significant for commercial banks than for MFIs.

9) Where MFIs have successfully utilised ICT to extend outreach to more remote areas, their service delivery models are often changed from group-based models to more traditional individual-client models. The nature of delivery channels changes from being manpower intensive to technology intensive. As above, this suggests that ICT innovations are more significant for traditional financial service providers than for MFIs.

10) The implication of 8) and 9) above is that, with increasingly functional telecommunications infrastructure, and with the commercial banks' advanced information and communication systems, innovation for service delivery and greater liquidity, they will increasingly "squeeze" the profit-margins of MFIs from above. This will force significant change in the role and business model of MFIs.

11) Banks have access to electronic banking infrastructure but lack the appetite and ability to manage risk and train the target (microfinance) market. MFIs have the relationship and credit technology but little or no access to high-tech infrastructure. There is a clear need and opportunity for strategic partnerships between commercial banks and MFIs.

12) MFIs will need to focus on their comparative advantage – that is, knowledge of, and relationship with, the microfinance client – to provide niche services that assist the poor to enter the broader financial system. For example, they might do this by enabling their clients to establish a credit history, to accumulate savings, and to increase their financial literacy.

13) These niche services that target poorer people are expensive to deliver, and it would leave commercial banks to “skim the cream” of successful microfinance clients at the expense of MFIs. This will place MFIs under significant financial pressure unless they receive budget support from partner banks and/or donor agencies. However, efficient, well-run MFIs ought to be viewed by commercial banks as important partners or subsidiaries, as they can provide a steady stream of new, proven clients from a previously untapped market.

*We recommend awareness-raising of the importance of strategic partnerships between commercial banks and MFIs to ensure that financial sector players are able to focus on their core strengths, compliment and support one another, and reduce overlap of services and activities.*

14) However, even commercial banks will require shared infrastructures and common standards so that costs associated with providing financial services to a dramatically larger client base can be reduced.

15) Shared infrastructures facilitate the flow of information (including financial transactions) within and between financial institutions, and also integrate institutions and their clients into the global financial system and the world-wide digital economy.

16) Integration of financial institutions including MFIs into the global financial system is an important step to harness the development potential of remittance flows from international labour migrants.

*We recommend that donor support be directed into research and development of common infrastructure platforms and associated technology solutions that encourage cooperation and collaboration, rather than customisation, among all financial industry participants including commercial banks and MFIs.*

17) Both financial and ICT policy and regulation need to be reformed so that they enable rather than hinder the development of shared electronic banking infrastructure.

*We recommend that donor support be directed to help regulatory bodies understand and develop appropriate policy and regulatory environments in which electronic banking infrastructure and initiatives can flourish.*