Pakistan Study

Microfinance and Branchless Banking

Models, Constraints, and Recommendations

For

The Widening Harmonized Access to Microfinance (WHAM) and Advancing Microfinance for Post-disaster Economic Reconstruction (AMPER) Projects

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Executive Summary

On the whole, Pakistan has many of the features that make agent-led branchless banking possible and even likely. Vibrant competition, growing data connectivity, generally permissive regulatory regime, and large untapped markets all point toward a medium-term (2-3 year) convergence of technologies and business models that could enable a rapid scaling up of more inclusive financial services, including lending, savings, insurance, and payment transfers. This will not happen, however, without some interventions to incubate business models, create demonstration effects, build internal capacities, and insulate some players from the potential for near-term losses arising from the need to innovate and experiment. Technologies aimed at the convergence of mobile telephony and banking are ahead of regulatory regimes, but still lack maturity in some respects. Pilot projects, using a set of technology, are warranted if aimed at providing additional business model data or "proof points".

The upside is that branchless banking models offer the hope of providing a means of rapidly scaling up microfinance in Pakistan and building more inclusive financial services. This report, aimed at an array of audiences, is intended to chart a way forward for various microfinance service providers, technology solution providers, and supportive agencies. Remittances, both domestic and international, also have a strong linkage to microfinance and can be enabled through many of the same channels as envisioned here.

Pakistan has a growing and vibrant microfinance sector, that nonetheless, reaches only about 1 million borrowers. Meanwhile the cellular providers, by contrast, are already reaching at least 20 million unique customers (52 million unique accounts). Financial services in the country are modernizing, with a host of recent foreign investments and acquisitions radically changing the face of the financial sector. At the same time, the Governor of the State Bank of Pakistan has declared that microfinance is a key component of financial services in the country and is pushing organizations to establish themselves as sustainable Microfinance Banks under the 2001 MFI Ordinance. As legislation aimed at legalizing electronic payments moves through Parliament, the mobile carriers are expressing strong interest in providing financial services. In addition, the national ID system reaches more than 70% of the population and is backed by sophisticated technologies and biometric information.

Despite these promising features of the landscape, there are currently no models to offer microfinance services over the cellular infrastructure, and little promise in the ATM networks, as they currently exist. Point-of-sale (POS) devices are found in merchant locations, but are legally restricted in their use for cash-in and cash-out transactions. There is more flexibility with non-regulated microfinance institutions and the specially regulated Microfinance Banks. Experiments in microfinance channels, using POS devices, appear to hold some promise, but are held up by agent issues. Stored value cards, heavily utilized in the payphone infrastructure, are not being used for financial services, and electronic payments remain tightly regulated and limited to utility-payments.

Real shifts in this market are therefore likely to come from a coalescing of entrepreneurs, existing technology providers, and innovative financial institutions. Together these players need to figure out the business and revenue models that will be necessary to achieve value for the end customer and revenue opportunities for all the participants. A value chain of participants that includes customers, technology companies, local service providers, retailers, financial institutions, and government agencies needs to emerge. It is unlikely that the level of scale required for sustainability will be achieved with only a small set of players. A critical element of financial modeling that is required in Pakistan is an understanding of the price sensitivity and value proposition for the customers. The various supportive agencies, providing both technical consulting and funding, should, in the view of the Consultant, work on financing the solution providers that are key members of the value chain. By helping them mitigate some of their risk, they are more likely to begin to build the infrastructural elements that all financial players can leverage. At the same time, it is important to build the business cases and financial models that define the costs, revenue opportunities, and roles of all the participants. And, the microfinance institutions need to understand more fully the technical and operational changes that their businesses will need to undergo in order to be included as these new solutions come to their markets. In Pakistan, the linchpin in the

model is the regulatory framework around the third-party agent. Staying focused on the agent-model, rather than the specifics of the technologies utilized, is a key recommendation of this report.

Project Scope

Sevak Solutions was engaged by Shorebank International Ltd (SBI) to help their USAID-financed WHAM and AMPER project [1] partners in Pakistan to evaluate the feasibility of a point-of-sale (POS) and/or cell phone based financial delivery system for the earthquake-affected regions of Kashmir and elsewhere in the country. SBI, the First Microfinance Bank (FMFB), and the National Rural Support Programme (NRSP) are seeking a technology platform and business model that would enable the institutions to provide loans, savings, insurance, intra-national remittances, and other financial products to their customers more efficiently. In addition, SBI seeks to assist Kashf, an urban-focused microfinance institution, in its attempts to provide electronic banking services to its market.

The four objectives of this assignment were to (1) provide SBI, NRSP, and FMB with an assessment of the feasibility of implementing a technology-based financial services solution in the earthquake-affected regions for Pakistan and Kashmir, (2) provide SBI and Kashf with an assessment of the feasibility of implementing a technology-based financial services solution in its urban markets, (3) recommend the best technology, partners, and other elements required for successful solutions, and (4) describe next steps toward development and implementation.

Team

The team involved in this project included:

- James Dailey performed preliminary interviews, traveled to Pakistan, and performed the local interviews and research. He was also instrumental in developing the recommendations, making presentations to each of the participating microfinance institutions, and preparing the final report.

- Janine Firpo managed the overall project, provided input into the preparation of recommendations, and assisted in writing the final report.

Approach

In August 2006, Sevak Solutions sent one of their consultants to Pakistan to assess the payment systems infrastructure as it related to microfinance. This was a high-level assessment that considered a range of financial institutions, including regulated and non-regulated MFIs, banks, and government agencies. The results of that study served as a basis for the activities undertaken in this assignment, which focused more exclusively on the technology, capacity, and business objectives of three microfinance institutions – FMFB, NRSP, and Kashf. In addition to a detailed analysis of each of these institutions, this study included an assessment of the local market conditions, due diligence on back-office system requirements, review of local service providers, and an analysis of the other requirements for these institutions to successfully integrate into existing payment systems or to advance their own solutions.

Prior to traveling to Pakistan, James conducted interviews with representatives from Shorebank as well as with technology companies that had products that could be relevant in Pakistan. He and Janine worked together to review the outcomes of the earlier assessment.

While in Pakistan, James spent 2 days with FMFB, 2 days with NRSP, and 3 days with Kashf. He also attended the "Branchless Banking Roundtable" meeting at the State Bank of Pakistan on April 30th. A number of

[1] AMPER is a USAID funded initiative for ***Advancing Microfinance for Post-disaster Economic Reconstruction***. SBI's partners in Pakistan are the National Rural Support Programme (NRSP) and the Pakistan Microfinance Network (PMN). WHAM is a USAID funded project which aims to assist microfinance institutions and banks better reach the "missing middle" of enterprises and its partners include First Microfinance Bank and Kashf Foundation.

individuals in attendance at this meeting were interested in knowing about ShoreBank's efforts to create agent-led solutions to the financial deepening challenge. In addition to these meetings, James met with a range of local technology providers. A complete list of the individuals and companies that were interviewed, both in Pakistan and prior to departure, is provided in the Appendix.

Pakistan Microfinance Market

Pakistan's economy has grown at 7-8% annually over the past several years, resulting in a cumulative realized growth of at least 30% over the past four years. This has largely benefited the urban society, where cars, consumer electronics, and other goods are available in well-stocked global and local chains. Those residing in rural areas, where as much as 80% of the poor live, do not seem to be benefiting from this economic growth.

Of the approximately 160 million people in Pakistan, 40 million (25%) live below the official poverty line and 30 million (19%) are underserved by financial institutions. Approximately 70% of the financial transactions carried out in Pakistan are cash-based even though the population wants to have access to checks and other financial instruments, such as credit and debit cards. Market demand for financial services among the poor is estimated to exceed $10 billion USD over the next three to five years.

Pakistan does have a range of banks and services providers that reach from top tier banks, such as Standard Chartered, to mid-range banks, such as CresBank, all the way down to unregulated microfinance institutions. The microfinance sector in Pakistan includes NGOs (led by KASHF), microfinance banks (led by First MicroFinance Bank), rural support programs (led by NRSP), and the largely-government run Kushhaili Bank which was initiated with 30 branches from NRSP.[2]

Table A1.2: Comparative Position of Microfinance Banks

Item	Khushhali Bank	First Microfinance Bank Ltd.	Network Microfinance Bank Ltd.	Rozgar Microfinance Bank Ltd.	Tameer Microfinance Bank Ltd.	Pak Oman Microfinance Bank Ltd.
Year Established	2000	2001	2004	2005	2005	2006*
Licensing Status	Nationwide	Nationwide	District-wide	District-wide	Nationwide	Nationwide
Sponsors	Commercial banks	Agha Khan Fund for Economic Dev.	Network Leasing	Individuals	President and his team	Government of Oman and Pak Oman Investment Co.
Product/Service Being Offered	Loans	loans, deposits remittances, insurance	loans, leasing, deposits	loans, deposits	loans, deposits	loans, deposits
Key Performance Indicators as of 31 Mar 2006						
No. of branches	63	24	1	2	2	0
No. of service centers	124	16	0	5	0	0
Loans outstanding	1,891,178	413,486	29,162	24,677	6779	0
No. of borrowers	227,684	21,542,	1,749	2,560	200	0
No. of female borrowers	45,848	4,555	415	316	0	0
Deposits	0	657,298	10,691	13,235	4,303	0
No. of depositors	0	31,140	3,962	1,472	671	0
Operating Income	400,500	94,881	10,100	6,500	14,941	0
Net Income	12,400	721	(7,800)	(2,800)	(19,602)	0

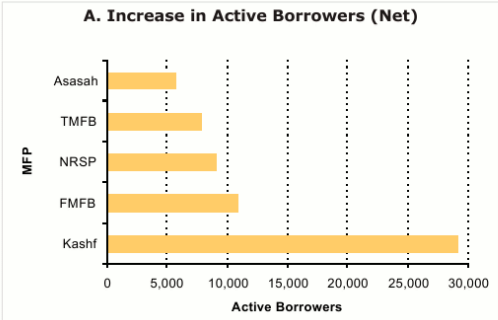
( ) = negative.
* Licensed by State Bank of Pakistan in April 2006.
Source: State Bank of Pakistan.

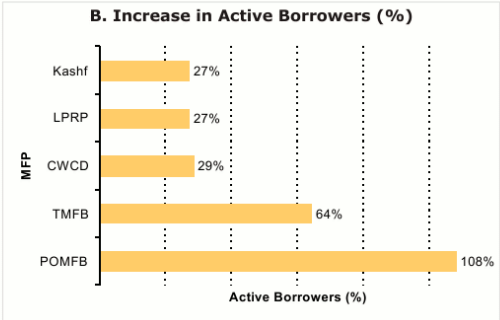
[2] "Proposed Loans and Technical Assistance Grant Islamic Republic of Pakistan: Improving Access to Financial Services (Phase I) Program" Asian Development Bank, November 2006

The MicroWatch Bulletin, put out by the Pakistan Microfinance Network and ShoreBank International, which includes formal banks, MFBs, and NGOs shows how these various players stack up against each other in terms of growth and outreach as of early 2007.

MARKET HIGHLIGHTS (Sept 30 - Dec 31, 2006)

Fastest Growing Microcredit Providers





C. Largest Providers of Microcredit (31-Dec)

S No.	MFP	Active Borrowers (Dec 31)	Market Share (% in terms of Active Borrowers)
1	KB	280,526	28
2	NRSP	236,329	24
3	Kashf	136,012	14
4	FMFB	52,679	5
5	PRSP	48,084	5

D. MFPs with Largest Geographic Spread (31-Dec)

S No.	MFP	Geographic Spread (No. of Districts)
1	NRSP	37
2	PRSP	20
3	FMFB	19
4	BOK	12
5	Kashf	11

Although there is a great deal of diversity within this range, the sector still is not meeting the untapped demand in the market. Together, these organizations are reaching only 1 million customers, approximately 5% of the total potential market. The gap between supply and demand is even greater rural and remote areas where it is much more expensive to do business.

One of the more recent changes in Pakistan microfinance market is the emergence of new microfinance players in the sector, such as BRAC, Tameer Microfinance Bank, and Pak-Oman Microfinance Bank. ASA and Grameen are also investigating opportunities in Pakistan. In addition, a number of the tier 3 banks and other financial companies are beginning to eye the microfinance market because they see future opportunities there. These players are still entering the market slowly, focusing first on individuals that make between $4 to $7 per day. However, the bottom end of their market is already touching the top end of the microfinance market, and it is only a matter of time before those distinctions blur – and disappear. These growing pressures are making sustainability and growth more critical for Pakistan's microfinance institutions and microfinance banks.

Research Findings

In order to maintain the confidentiality, research findings and recommendations for First Microfinance Bank (FMFB), the National Rural Support Programme (NRSP), and Kashf are reported separately.

In addition to the microfinance institutions, the Consultant also interviewed a range of technology companies and service providers, both Pakistan nationals as well as a few key international companies. A complete list of each of these companies, along with a brief description of their businesses, is also contained in the appendix. Attempts were made by ShoreBank International staff to arrange meetings with telecom representatives, most

notably Mobilink, but these were unsuccessful due to lack of availability of Mobilink executives.

The research findings that relate to the technology sector in Pakistan and its relationship to financial services are integrated into the section on branchless banking.

Branchless Banking

As mobile phone usage expands, so may opportunities to bank the unbanked. With m-banking, low income people no longer need to use scarce time and financial resources to travel to distant bank branches. And since m-banking transactions cost far less to process than transactions at an automated teller machine or branch, banks can make a profit handling even small money transfers and payments (BAI 2004 and Booz Allen 2003).

To reach the massive market of potential banking customers, the microfinance sector in Pakistan must find new ways of delivering products, especially to more rural environments. Although the top tier banks have established ATM and POS networks, until recently no microfinance banks or institutions were integrated into these national systems. Within the past year, Tameer Microfinance Bank bought its way into these networks. Now their customers can access most of the ATMs and POS devices in the country. Due to the cost constraints of building the requisite solutions, the microfinance players in Pakistan should consider collaborating on infrastructure and seek to understand what is required to enable them to participate in the already established and emerging solutions.

The analysis that follows is meant to help chart the course for microfinance institutions in Pakistan as they seek move beyond the traditional "brick and mortar" branch model to a lower cost alternative, and as they seek to rapidly grow from their current combined client base of 1 million to reach tens of millions of customers in the next 5 – 10 years. It is **critical to remember** that innovations around technology and business process go hand in hand. One can't be accomplished successfully without the other.

Agent-Led Model

For the microfinance client, a major benefit of a branchless banking approach is the flexibility and proximity of banking services. The opportunity for a financial customer to bank close to home is a key value from the customers perspective. Since critical microfinance services, such as loan payments and savings deposits, involve cash exchange, most branchless banking options for microfinance are going to require cash-in and cash-out points. To achieve a low-cost and pervasive landscape of cash-in/cash-out points, a network of "agents" will be required. This is true regardless of the type of technology solution deployed - ie, point-of-sale (POS), mobile phone, PDA, or other. Agents can either be employed by the financial institution or they can be independent third-parties, such as merchants or gas station attendants. This approach, where "agents" serve the role of a "virtual ATM" or bank is referred as the "agent-led model".

In Pakistan, there are a number of different networks that could serve as agent locations for branchless banking. Some of the options are listed in the table below.

Access Points	*Number of nodes*	*Locations*	*Comments*
Cigarette Shops	More than 625,000 shops	In every neighbourhood	Interesting option, since locations nearly ubiquitous. Potential electricity and connectivity challenges.
Mobile Phone Centers	Approximately 425,000 Mobilink retailers, and about 100,000 retailers for each of the second tier companies (Telenor,	Throughout connected districts, differs depending on cellular provider	Sometimes one retailer is shared by a few cellular providers. Connectivity, cash management, and transaction

Access Points	*Number of nodes*	*Locations*	*Comments*
	Warid, and Paktel)		handling all present.
Small Phone Operators (PCOs)	Approximately 353,000 shops	Throughout the country	Relatively small businesses. Liquidity concerns.
Postal Service Centers	Approximately 12,000 sites	All cities and major towns	Over a century of experience in a particular form of money transfer. Liquidity concerns. Capacity and efficiency concerns.
Pakistan State Oil Stations (PSO)	Estimated 1,200 POS enabled stations out of a total of 3,700 gas and service stations, but number is growing rapidly	On main roads	Connecting to POS networks, familiar with handling cash. Liquidity and corporate transaction tracking, strong points.
POS Network (includes PSO)	Approximately 20,000 split between two primary providers – Orix and Marshall	Larger merchants, urban and peri-urban	Some legal constraints over cash and agent models. Overlap with MF customer base currently limited.

A number of hardware devices and types of applications can be used to deliver branchless banking. A few of the possible use cases using cell phones with SMS messaging and POS terminals are described in the appendix. The technology that should be used is dependent on local infrastructure, cell phone pricing, and other considerations that will be described in more detail below. In a perfect world, all of the solutions – cell phone, ATM, POS, internet, kiosk – should be interconnected and interoperable, providing the greatest range of options for the financial institutions and their customers.

Branchless Banking Value Chain

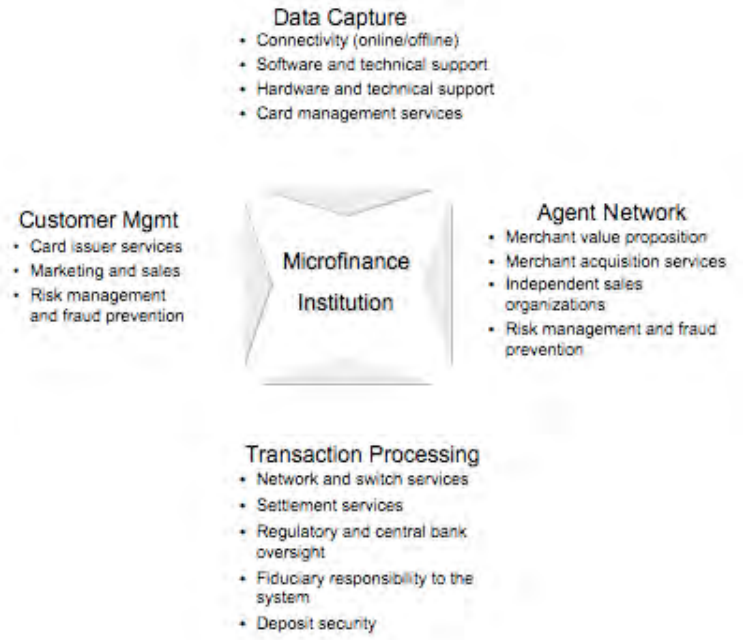
In order to provide branchless banking services there are a number of services that need to be considered. The range of services can be simplified a bit by breaking them down into four key areas, each of which needs to intersect with the microfinance institutions. These four service areas are: data capture, access points, transaction processing, and customer management. These service areas can be described as follows:

- **Data Capture**. This area refers to the hardware, software applications, and other elements that are required to interface with the end customer. Cell phones, POS devices, ATMs, smart cards, debit cards, scratch cards, cellular connectivity, and the application software that runs on these devices connecting them to back-end servers. Some of the services required in this area include hardware procurement and support, software upgrades, maintenance, and support, and card management.
- **Agent Network.** The locations where customers access their financial services are the access points. These could be bank branches, independent agents, kiosks, technology centers, and so on. A number of services are required to establish, manage, and integrate these access points into the overall financial network.
- **Transaction Processing.** When a customer uses an access point to perform a financial transaction and that information is captured electronically, the information must flow to back-end systems were the transaction is captured, recorded, and transmitted to an appropriate financial MIS system where the transaction can be reconciled. This process becomes more sophisticated when multiple financial institutions are using the same access points. When this occurs, clearing and settlement services need to

be added to the mix.

- **Customer Management.** Often overlooked, the relevance of financial services to the financial customer's needs are critically important, particularly when innovative products are introduced. The services delivered through branchless banking need to be considered as new product offerings. As such, there should be initial market research to confirm the appropriateness of products, marketing and advertising of new products to attract customers, and adequate training.

These four areas and the services required in each are further described in the diagram below.



Regardless of the branchless banking option that is chosen by the microfinance institutions, there are a number of requirements that must be in place before an organization can consider integrating these solutions into their business. The following discussion describes these various requirements and their status in Pakistan.

Transaction Infrastructure

Definitions

The transaction infrastructure includes the hardware, application software, service providers, financial institutions, switches, clearinghouses, and all the other elements that are part of the branchless banking or electronic banking value chain described earlier. In order to reliable, the transactions that flow across, and are managed by, this infrastructure needs to be:

- ***Authentic***. The transaction needs to be linked back to a specific person. Authentication can be handled through a simple visual check of a photo id or through a sophisticated combination of PIN number and biometrics (fingerprinting).

- ***Secure***. Security is built into the system at many levels, both from a technical and operational perspective. Encrypted data is a form of secure data.

- ***Non-Repudiated***. Repudiation refers to the concept that transactions must be accepted, if they were properly formed and submitted. This ensures that the agent has to bear only those risks that they can control (e.g. getting proper identification). Non-repudiation means bank can't deny to the customer that transaction occurred and likewise the customer can't deny to the bank that a transaction occurred.

- ***Auditable***. Accuracy and audit-ability go hand in hand, with accurate transaction amounts backed by the ability to know who was involved in creating, handling, and modifying the transaction. To date we have seen that many microfinance customers still want a receipt as an audit trail. It is important to keep this in mind as a requirement for electronic banking. There are even some precedents to suggest that microfinance clients do not like mobile solutions due to the lack of receipt.

- ***Private***. Privacy appears to be not that important in Pakistan law and public perception. Given the move to electronic records, this issue should be addressed.

Another key aspect of a reliable transaction infrastructure is the reliability of the connectivity infrastructure across which it operates. Connectivity is discussed in the next section.

Existing Transaction Infrastructure

While not comprehensive, the transaction infrastructure that exists in Pakistan today has a robust base. Check clearing, ATMs, and POS networks abound in the cities and major towns. In addition, there are new entrants to the market such as mobile phones and kiosks. The elements that exist today are described below

Informal Trading Networks

For the better part of the past thousand years, traders along the great roads of what is now modern day Pakistan have utilized a form of IOU to transfer funds and provide business liquidity via trusted relationships. These are now often associated with criminal elements and aren't part of any microfinance operation. Nonetheless, it is common knowledge that the transporter "union" provides money transfer services, for a hefty fee, and it is likely that many customers of microfinance also use these informal services. Even if such networks could be utilized for microfinance, they would make poor agents for delivering transactional services, except for long-distance funds transfer. Needless to say, they are not compliant with regulations.

Check Clearing

Pakistan has a well-developed check clearing mechanism that currently functions without the use of a real-time-gross settlement (RTGS) system. The banks have corresponding bank relationships and hold overnight liquidity in each other's accounts to ensure that checks clear against each other. To minimize risks, this is a highly regulated process and there are limits to the size of checks that can be drawn. Checks are cleared by the State Bank. In those few cases where microfinance institutions participate in this system, they do so through a connection to another bank that is a member of the check clearing consortium. For example, CresBank provides this service to Tameer Microfinance Bank and Habib Bank to First MicroFinance Bank.

The State Bank is now automating this process through a switch called PRISM. It will cost banks $125,000 to join the switch when this process is completed, potentially later this year. At this price, it will probably remain too expensive for microfinance institutions to participate more fully than they do today.

ATM Networks

There are roughly 2,000 Automated Teller Machines (ATMs) in Pakistan. Unfortunately, these ATMs are quite unreliable and are reputedly unable to dispense cash accurately 30-70% of the time. Those interviewed seem to agree that ATMs on bank premises were most reliable, which those at other sites worked –at best - 30% of the time. According to one source, the main problem relates to cash-currency issues. Pakistan has two forms of the common 1,000 rupee note, both of which many issues related to printing quality. These differences in consistency of the rupee notes cause the machines to fail when they dispense cash. Several people say they were cheated out of thousands of rupees and no longer use ATMs. This reputation does not bode well for microfinance customers' willingness to use similar machines.

There are two ATM networks in Pakistan, MNet and 1-Link. MNet was started by the Muslim Commercial Bank. It currently has about 9 members including Citibank, AMEX, Standard, First Women Bank, MCB. This company is structured as a wholly owned subsidiary of these banks. 1-Link, a public guarantee company, started in 1999 with 2 members and has since grown to 19 members with 75% of the market. It is considered the better of the two switches. More than 1 million transactions per month are processed through 1-Link. The technology network behind 1-Link is provided and managed by TPS, which sells its services and software across the Middle East, North Africa, and South Asia. TPS also has extended relationships with microfinance institutions in the region, most especially BRAC Bank in Bangladesh and, recently, Tameer Microfinance Bank in Pakistan. TPS provides a switch and clearinghouse solution as well as a complete turnkey card-issuance service, known as IRIS.

The 1-LINK price structure is as follows:

- One time membership fee: $25,000
- Software modification to HSM standard: $60,000
- Monthly maintenance fees: $1,500 per branch per month
- If a transaction occurs within the 1-LINK network, then there is a 15 rupee fee to a member bank. If the transaction has to pass through MNET, then there is an additional 15 rupee fee for a withdrawal, 7 rupees for a balance inquiry.

Tameer Microfinance Bank has, via a subsidy, purchased a membership in 1-Link network. As a result, their customers can now use Tameer Microfinance Bank issued cards at any participating ATM in the network. Hurdles still exist for Tameer Microfinance Bank. The bank has offered to provide other microfinance institutions with access to the ATM network through their membership. In such a scenario, another microfinance institution could use the ATM network as a means of disbursing loans to their customers. Tameer Microfinance Bank is also building an ATM network of its own, specially crafted machines. It is possible that these could also be part of a service offered to other institutions.

The State Bank (SBP) has said all banks in Pakistan must connect to one of the shared ATM networks. The two networks are in the process of connecting more reliably. The networks are already connected, but errors can take up to 3 months to correct. There is also discussion within the SBP of granting just one network license, which would likely be 1-Link, given its greater market penetration.

Point-of-Sale (POS) Networks

There are two major POS networks in Pakistan, one of which is managed by a combination of Orix Leasing and the Access Group. This is an independent network that any bank can join. The other network owned by a group of banks and is managed by a company called Marshall. Both network have approximately 10,000 POS

terminals in place for a total of 20,000 terminals. Most of these are located in hotels, gas stations, or with other high-end merchants primarily in urban and peri-urban areas.

Since there are two separate switches, merchants often need to have more than one POS terminal at their establishment. Sometimes merchants even swap out the phone line from one POS to another, depending on which they are using. The central bank has given some target dates for integration of the switches, but it is unclear whether these objectives will be met. TPS predicts that it will be more than two years until all of the various networks (ATM and POS) are integrated.

At present the microfinance institutions are not linked into existing networks. Although the Access Group has expressed interest in working with microfinance institutions, the appropriate financial models have not be articulated to them in enough detail for the company to see the business value in this sector.

Usually debit cards and ATM cards are the same, but in Pakistan a fragmented banking infrastructure had led to multiple switches and Debit Cards – which can be used on specific POS terminals for purchases, but can not be used in ATMs or for cash-out purposes. The volumes of these types of transactions are around 2.5 million transactions per year. The main provider of this solution is the Access Group.

Mobile Banking

Another opportunity that is gaining attention in Pakistan is the concept of mobile banking in which a cell phone becomes the mechanism for financial transactions. CGAP has begun to investigate whether this type of solution would be appropriate in Pakistan for the delivery of financial services to the microfinance community. To date no clear decisions or direction has been identified. The only financial transactions that are being handled through cell phones in Pakistan today are account-to-account transfers. And these services are only available to the top tiers of society.

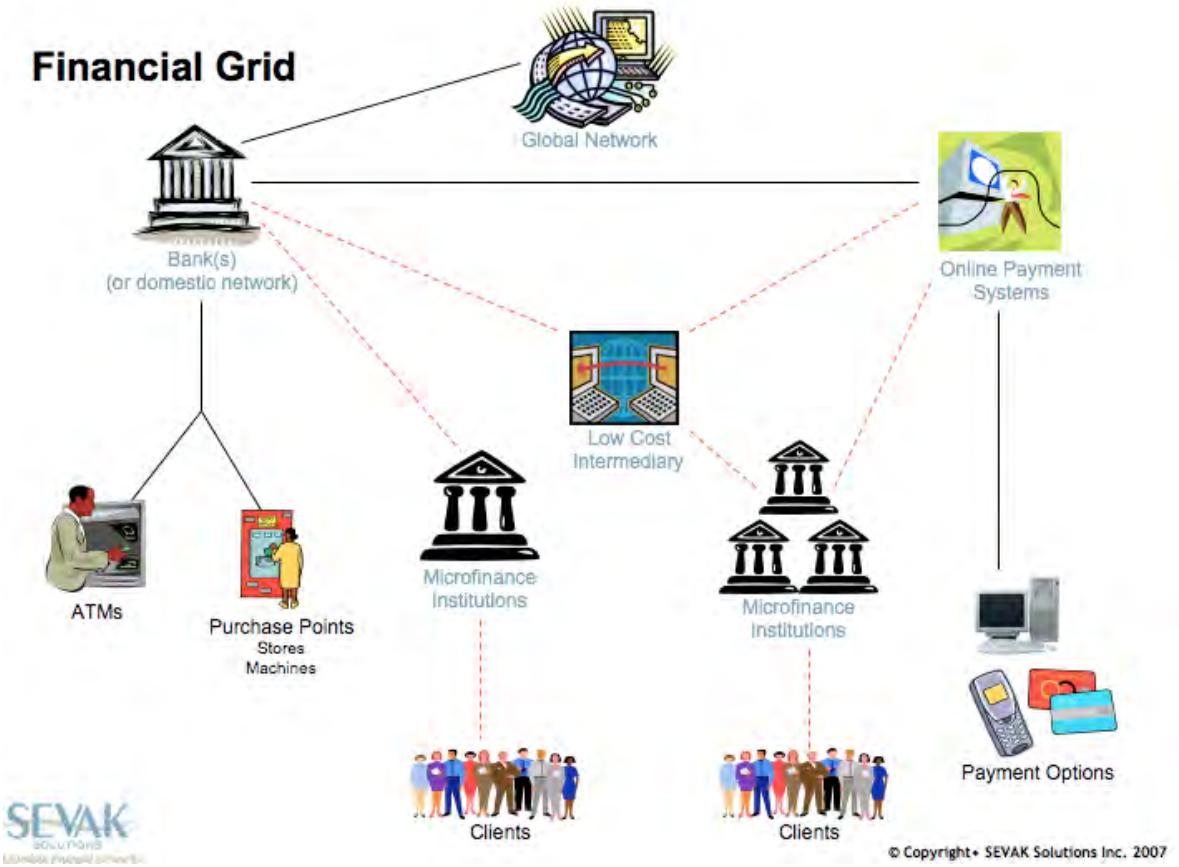
Utility Payment Kiosks and NADRA

A relatively new entrant in the branchless financial services space are kiosks that are being placed by the National Database and Registration Authority (NADRA) to enable citizens to pay their utility bills. The kiosks are found in major cities and towns throughout Pakistan. NADRA is reputed to be the largest and most sophisticated centralized database of information in Asia about a country's citizens. That technical sophistication may pose a high barrier for Microfinance providers to connect to the NADRA infrastructure.

Transaction Infrastructure Gaps

Although there are strong check clearing, ATM, and POS networks in Pakistan, microfinance institutions and microfinance banks are, for the most part, not included. Entrance fees and other requirements for participation are too high for these organizations. Geographic overlap between microfinance customers and existing network often not a match. And the financial models and business case for the local technology and service providers to reach to the microfinance customer has not been made.

The diagram below shows through the dashed red lines, the areas of integration between microfinance institutions and the rest of the financial structure in Pakistan that do not exist yet.



More explicitly the gaps that currently exist, include:

- Electronic access points between microfinance institutions and their clients
- Linkages between microfinance institutions and banks that are part of the ATM and POS networks
- Connections to mobile phone based financial payment systems

A transacting solution for microfinance institutions is likely to contain multiple elements. For instance, a microfinance institution may use a check to issue new loans and a telecom transfer linked to a POS switch to accept payments on that loan. In the latter case, the institution would need to be connected to the existing systems or it would need to create its own network. Since switching is a highly commoditized process, there is no reason for the sector to create their own solution, but there is a reasonable case for having a separate switching implementation (using one of the existing tools) and business model that pools and allocates costs appropriately. If the microfinance institutions collaborated together in this way, then as each institution build out its agent network, that agent could become a provider for clients of other microfinance institutions as well – and visa-versa.

Reliable Connectivity

The telecom sector in Pakistan is liberalized and there are already six mobile phone operators with more planned. The current landscape, which is depicted in the table below[3], is dominated by Mobilink which has 3 times more subscribers than Ufone, its largest competitor. Telenor and Warid are the newest entreants to the

[3] "Proposed Loans and Technical Assistance Grant Islamic Republic of Pakistan: Improving Access to Financial Services (Phase I) Program" Asian Development Bank, November 2006

market, both having less than a 3-year history.

Table A1.4: Mobile Phone Operators in Pakistan
Growth Rate of Mobile Cellular Subscribers FY 2000–2006

Year	Mobilink	Ufone	Paktel	Instaphone	Telenor	Warid	Total	Growth Rate
2000	114,272		80,221	112,000			306,493	15.39
2001	309,272	116,711	96,623	220,000			742,606	142.29
2002	800,000	350,000	218,536	330,000			1,698,536	128.73
2003	1,115,000	550,000	319,400	420,000			2,404,400	41.56
2004	3,215,989	801,160	470,021	535,738			5,022,908	108.90
2005	7,469,085	2,579,103	924,486	454,147	835,727	508,655	12,771,203	154.26
2006	17,205,555	7,487,005	1,040,503	336,696	3,573,660	4,863,138	34,506,557	170.20
Jul–2006	18,321,599	7,884,703	1,121,821	316,000	3,887,774	5,246,565	36,778,462	
Aug–2006	19,181,846	8,356,668	1,458,008	302,000	4,262,599	5,632,685	39,193,806	
Sep–2006	20,315,739	8,860,406	1,507,446	285,000	4,597,008	5,936,603	41,502,202	

Source: Pakistan Telecommunications Authority.

The sector is experiencing rapid growth and is heavily into a “loss-leader” approach to gain market share. Consolidation is likely two to three years away, given the enormous market size and growth potential. Even though value-added services are the new “buzz-words” in the market, the cellular providers are usually referring to commodities such as ring-tones, photo sharing, and email access. Nonetheless, the mobile providers were well represented at the SBP’s forum, which indicates an interest in financial services and potentially, the microfinance sector, as a new business opportunity.

For financial service delivery to be attractive to a cellular provider, the telecom company is going to have to see both a stable volume of initial transactions as well as a high growth potential as this is a volume business. Although many attempts were made the Consultant and some of the microfinance institutions to schedule meetings with Mobilink representatives, no meetings ever materialized. The rapid growth and other high margin opportunities currently available to Mobilink may explain the company’s poor response. Other telecom companies such as Warid and Paktel were approached. Warid expressed great interest in this area, and discussions with them should be pursued.

Reliable connectivity between the customer-facing devices all the way through to the microfinance institutions MIS systems are critically important for a successful branchless banking implementation. This the transport layer for transactional information. Although cellular coverage can appear pervasive, that is not a guarantee of reliability or quality, particularly when it comes to data transmissions. Therefore, it is important that the data transmission quality in Pakistan be tested from a variety of locations prior to making a final decision about appropriate technology. In addition, it is highly recommended that local pricing for a range of different transmission types of compared as well. Experience in Uganda demonstrated that GSM is actually more reliable and less expensive even though the GPRS system is considered technically superior. If it is wide-spread, WiMax can be the least expensive option of all.

Qualitative impressions gathered by the Consultant during this research suggests that:

- All the telecom providers in Pakistan are struggling to keep up with exponential growth and the

opportunity constantly new customers for their existing products and services.

- Dropped calls and/or the inability to get a dial tone does occur about 5% of the time. Others with familiarity in this country claim that cellular reliability can be quite poor.

- However, reliability and predictability of the cellular systems is increasing every year. The current problems are likely to be relatively short-lived.

- SMS is not currently a frequent application type, and extended GPRS was recently introduced and is still unreliable.

- A new company, Wateen, is entering the market later this year to introduce a WiMax product. Wateen is sister company to Warid, the cellular provider. Both are owned by the same parent company.

Core MIS Technology

Products that are designed with a paper-based system in mind may be leaving a lot of value "on the table" because these products are designed to the limitations of the operational environment. If operational constraints are removed during the design of core MIS, then processes can be changed and the products designed along with them. This may strike some organizations as a shift in methodology, which is often held to be sacred in microfinance. The recommendation here is to take a fresh look at how business is done with an eye toward innovation first, and optimization second. For example, a line of credit may be a more appropriate product, allowing a customer to withdraw funds on an as needed basis. Or, a product that allows a farmer to buy the inputs directly from a supplier using that line of credit may be more useful than cash-in-hand.

Management information systems for microfinance should cover the features that are well understood in the industry, such as portfolio management, client management, field officer productivity, and cash management. In addition the MIS should support multiple products, interest rate schemas, permissions driven roles, and integration into accounting. User interfaces should be easy to use, and understand. For deposit taking institutions, there is a need to have the same transaction information as well as clear, auditable systems that track how the deposits and withdrawals are handled. The extent to which the core MIS supports a variety of workflow processes, in a flexible and extensible, manner is also held to be of vital importance.

In business models where the microfinance institution is not handling cash, the MIS may still need to track the position of the portfolio, i.e what payments, disbursements, or withdrawals apply to which loan or savings accounts. Even as the microfinance provider gets out of the business of transacting, handing portions of that task over to agents, the institution will still need to maintain transaction records. This is not to say that the microfinance organization needs to maintain electronic transaction records on-site. Rather, with the advent of application service providers, it is possible – and even recommended – that microfinance institutions outsource this part of their operation.

The Mifos Project, a freely available open source solution initially developed by Grameen Foundation, was designed to operate as a web-enabled application. This allows a separate technology firm to provide the back-end system to a microfinance institution via an online connection and simple web-browser machines – rather than expensive servers at each branch. Emergen, a firm in Pakistan is ready to provide back-end services in Pakistan using the Mifos software. It is a sound recommendation to explore this model, and the Mifos software in particular, irrespective of the agent models contemplated here. Under an open source license, local service providers can compete on service but use the same software, thereby lowering barriers to entry and removing key challenges in MIS development. Open source software should have a lower total cost of ownership than either build-it-yourself or licensed strategies, although the industry experience to date is extremely limited.

If a microfinance institution seeks to link into an ATM, POS, or mobile phone networks, then the organization will have to have a core MIS that is capable of connecting to the technology systems and switching mechanisms that sit behind those networks. If the technology on which the payment systems depend run in a real-time, online mode, then the microfinance institution's central database will need to be available on demand. This is not possible if that server is plagued by power failures, unreliable connectivity, or unsophisticated systems architectures. For many microfinance institutions these requirements are beyond their current capabilities. As a result, the organizations will either have to undergo significant technology overhauls or transformations in order to meet the requirements of network providers. Or the microfinance organizations will need to outsource all, or part, of their MIS management. The requirements become even more challenging for microfinance institutions that use decentralized approaches to their data management, where each branch maintains its own records. In these cases, the payment network provider would either need to work with the microfinance institution to build links to every branch server, or the microfinance institution will need to shift to a centralized approach to data management. All of these technology issues need to be considered as part of a strategy to integrate ATMs, POS terminals, of mobile banking into a microfinance institutions' business. Although some of these challenges can be overcome in the short term through manual MIS updates, as the payments services scale there will be a need to automate the entire process. At that time, the microfinance institution's technology infrastructure and team will need to be ready to meet the demands of the network.

Regulatory Framework

There are several reasons to think that the regulatory regime in Pakistan is friendly toward microfinance, including statements made by both the Prime Minister and the Governor of the State Bank of Pakistan (SBP). Nonetheless, prudent financial management, and the oversight by the SBP of deposit taking institutions are appropriately strong.

The Consultant Group to Assist the Poor (CGAP), a part of the World Bank, recently analyzed the regulatory regime for branchless banking in Pakistan. They concluded that there are a few items that need to be clarified for cash-handling by agents and Know-Your-Customer (KYC) compliance[4]. However, they conclude that in general the law for Microfinance Banks (MFB) is permissive, while noting that actual regulations are not yet written.

Financial & Business Models

Although this is the last point in this list, sound business and financial models for payment systems are actually the most critical element of their success. The challenge is that these models can not be determined in isolation because profitability depends on a range of participants as described earlier in the discussion about the value chain. In addition, the payments space is a volume business. So it is difficult to justify costs unless there is a strong indication that very significant transaction volumes will be flowing through the infrastructure in a short even time that the companies involved in the service delivery can sustain their businesses until they reach a break-even point.

This situation creates almost a Catch-22 because as the market develops there is not enough transaction volume to encourage entrepreneurs to build payments businesses, especially as it relates to the microfinance market, but at the same time transaction volumes cannot grow until some players come into the market. This challenge has been overcome in other markets in a number of ways. When industrialized countries faced this same obstacle in the 1960's when credit cards where first introduced, they realized that the only way to build profitable

[4] The laws require that all customers have the new National Identity Card as first step to drive transparency. It may be possible to lower the KYC requirements for lower amounts of money transfer in "far flung" regions of Pakistan.

opportunities was to coalesce around shared technologies and a form of co-opetition in which financial institutions cooperated around infrastructural and commodity elements, while competing on products and services.

In other areas, the business risk is being underwritten by donors that are developing the market by supporting the technology companies and other service providers that are taking the risk to enter this space. In still other cases, the service providers are seeking to meet the needs of higher value customers, such as wealthy individuals, utility companies, and government agencies, first. Only after – or as - they build their business with these more lucrative customers will these companies look to the microfinance market. The dangers for microfinance institutions in this approach include the length of time it will take for their business needs to be taken seriously, the potential for business and financial models to have solidified before microfinance customers are considered with the resultant possibility that those models will not be attractive to the microfinance institutions or their customers, and the risk that banks or other new players will have entered the microfinance market with more attractive products undermining the business of the institutions that originally catered to the microfinance clients.

Business Drivers

With all the interest and excitement about the potential of branchless banking and mobile payment systems it is easy to overlook the primary reasons for considering this opportunity: the business drivers within the microfinance institution and the value proposition for the microfinance customers. Before a microfinance institution launches a branchless banking initiative, it is critically important that the organization perform the requisite market research to determine how their customers would use the service, whether their customers see value in the service, and what they would be willing to pay. These questions will answer important aspects of the product development and financial modeling processes. Without this core information, it will be very easy for a microfinance institution to get it wrong. Pilot activities, if they are undertaken, should include these elements as part of the plan and as part of the outcomes.

The same holds true for the business drivers. They should be well articulated in advance of any initiatives, and a cost comparison between the current ways of achieving outcomes and the cost of these new solutions should be compared. There are, of course, intangible benefits and business process change that will result for the integration of branchless banking and/or mobile banking that cannot be quantified. But that should not preclude the organization for quantifying and comparing all the components that can be measured.

General Recommendations

The bulk of the recommendations for FMFB, NRSP, and KASHF are contained in separate appendixes for purposes of confidentiality. This section only contains a high-level set of recommendations that are consistent across all the organizations and technology companies included in this research.

1. Focus on agent-led branchless banking models to ensure that there are cash-in and cash-out points for microfinance clients.

2. Assist microfinance partners in engaging in appropriate pilot activities as described in institutional appendixes. Envision these as a starting point.

3. Strongly encourage partners to connect to existing ATM and POS networks through either membership, if possible, or by piggy-backing on another bank. This would parallel the approach KASHF and NRSP have taken with MCB to participate in the check clearing system.

4. Consider a sector-wide solution that allows several microfinance institutions, banks, and/or other financial providers to share the costs of deploying and maintaining the infrastructure. This approach also allows the agent network to grow more rapidly, which increases the value to existing and new

customers.

5. Invest in the development of the financial models that will be required to determine what is the best business model for agent-led branchless banking in Pakistan. Within the financial modeling, compare individual institution approach with a consortium model.

6. Ensure that the technology solution leverages the rapidly growing cellular infrastructure, but do not assume that the reliability of that infrastructure will be high enough for online real-time connections in the shorter term – particularly in rural areas. As a result, build a strategy for today that can enable transition to online, real-time as the connectivity improves.

7. Perform an analysis on the transaction speeds and reliability across a range of telecom options, such as SMS, GMS, and GPRS. Also investigate the pricing structure and volume requirements for each of these options.

8. Focus on the smaller cellular providers because they have more incentive to experiment and to provide a range of services that their competitors are not considering at this time. Work with them to provide appropriate pricing and geographic reach for the agent-led model. Warid demonstrated keen interest in this opportunity and should be pursued.

9. Work with regulatory partners to enable savings deposits, cash withdrawals, and other higher risk financial services through independent agents. In particular, strengthen the participation of the Pakistan Microfinance Network in the MoIT-SBP (Ministry of IT and State Bank of Pakistan) working group by endorsing or sponsoring working groups within the association of interested members.

10. Encourage microfinance partners to improve the connectivity between their branches and heads. Also encourage them to develop MIS strategies that move their institutions toward core banking quality back-end systems that will enable them to interconnect with existing and emerging branchless banking payment systems. Microfinance institutions should also estimate the total cost of ownership between the different MIS options, ie internal development, buy, license, share (open source), or out source.

11. Consider making grant and capital investments in the technology companies and local service providers that are building, or will build, businesses to provide these services to microfinance institutions are a critical – and still relatively unheralded – element for success.

Appendix

Specific individualized reports were prepared for

- First Microfinance Bank,
- Kashf Foundation,
- and the National Rural Support Programme.

These reports provide specific technical reviews on the position of these three organizations to take advantage of potential branchless banking options. These reports have been excluded from this public release of the report to protect the confidential and propriety nature of some of the information for each of these individual institutions.

IT Companies Interview List

Local Technology Providers (Pakistan-Based)

Mohammed Sohail, CEO, TPS – Karachi *(www.tpsonline.com)*
TPS is a software, systems, and consulting firm with offices in Karachi and Dubai, that specializes in e-banking and e-payment products, solutions, and services. The company process 75% of the ATM transactions in Pakistan on behalf of the 1-Link, one of the two primary ATM networks in Pakistan. TBS also offers a complete turnkey solution for card issuance and management – via the IRIS company. Phoenix, their back-end system, can access merchant services (Mastercard, VISA) and can connect into telecom systems and POS networks. TBS focuses on providing the switch and developing partnerships with other the providers that are required to supply ATMs and other elements of the end-to-end value chain.

Imran Qureshi, CEO, Access Group / Orix Leasing – Karachi *(www.access.net.pk)*
The Access Group partnered with Orix Leasing, the largest leasing company of consumer goodsin Pakistan, Orix. Together the companies implement and manage the one of the largest POS networks in Pakistan. They also work together to offer microfinance services across this network, which is primarily urban based. The microfinance work is being supported by a $300,000 UNDP grant. The Access Group provides the backend for banking debit cards in Pakistan, handling roughly 2.5 million transactions per year, which they say compares well to the 3 million handled by the ATM network. Part of this business competes directly with TPS.

Faraz Khan, CEO, Emergen – Karachi *(www.emergen.com)*
Emergen is a systems integrator that is focused on providing outsourced technology services to its clients, thus allowing their customers to focus on their core competencies. Emergen positions itself as a low-cost, but high quality, solution provider utilizing entirely open source software. They provide the backbone to Tameer Bank's IT department and are responsible for everything in the IT setup; ie, hardware, connectivity, security logins, VoIP. Emergen is responsible for all the IT facets of Tameer Bank's business except the core banking system, which is not open source. Emergen is interested in leveraging the Mifos system to provide an open source MIS solution for microfinance institutions in Pakistan.

Warid Telecom – Lahore *(www.waridtel.com)*
Warid is one of six cellular providers in Pakistan. They are the third largest provider with 4.5 million clients as compared to the 16 million subscribers of Mobilink, the market leader. As a lower cost entrant to the telecom space, Warid has been focussed on a strategy of capturing customers that are not by the Mobilink system. For example, they have an extensive pre-paid base, which favors the lower economic market. KASHF already has a relationship with Warid. There might be an opportunity to expand upon that relationship to operationalize a payment solution for Kashf. Warid is launching a person-to-person, "top up" function, which allows value to be transferred from one Warid customer to another as well as from specific authorized Warid resellers (agent-merchants). They are interested in offering this capability as "service" to KASHF that the institution could then provide to its customers.

InfoSpan – Islamabad *(www.no-borders.com)*
Met with Shoaib Malik (VP No Border Technologies), Larry Scudder (Deputy CEO InfoSpan -Pakistan), and Rehan-ul-Haq Khan (Project Manager). InfoSpan has recently extended their United States-based (California) operation to a offshore office in Pakistan and has operations around the world. The company specializes in building call centers and providing IT outsourcing. In Pakistan, the company is working with Askaria Bank to build a POS network across a number of government-run procurement/military stores. The company is

interested in expanding its business and becoming a provider to the microfinance sector. Mohammed Yunus is on the advisory Board. However, our analysis is that they are still relatively new to this space and do not have a strong sense of the market realities, such as appropriate pricing structures and demographics.

Rizwan Shoukut, Independent Consultant
Mr Shoukut, who previously worked in the telecom practice at Bearing Point, is highly knowledgeable in the telcom/financial services industry and launched a company in the 1990's that successfully introduced smart cards to Pakistan in the PCO market (pay telephones). Recently, Mr. Shoukut has reached out to the mobile operators and microfinance providers to explore new business models that would outsource the agent-model to a third-party company.

Wateen (part of the Abu Dhabi Group, same as WARID)
Wateen was mentioned by Emergen, which is tracking the local loop and connectivity space carefully. Wateen, part of the Abu Dhabi Group is a recent entrant in the Pakistan internet service provider market and plans a 100-city WiMax network within the year, dramatically altering the connectivity situation for the "last mile"

International Technology Providers

SMART Telecom – The Philippines *(www.smart.com.ph)*
In town for the "branchless banking roundtable" gathering at the SBP, the representatives from SMART (subsidiary of PLDT) are very interested in how their solution could be applied in Pakistan. They are largely focussed on remittances, particularly financial flows from the GCC to Philippines as well as from Pakistan to the Philippines. Nonetheless, SMART is very interested in the broader financial market in Pakistan and would be willing to collaborate on branchless banking opportunities in microfinance, as they believe that their full-feature solution can accelerate any strategy.

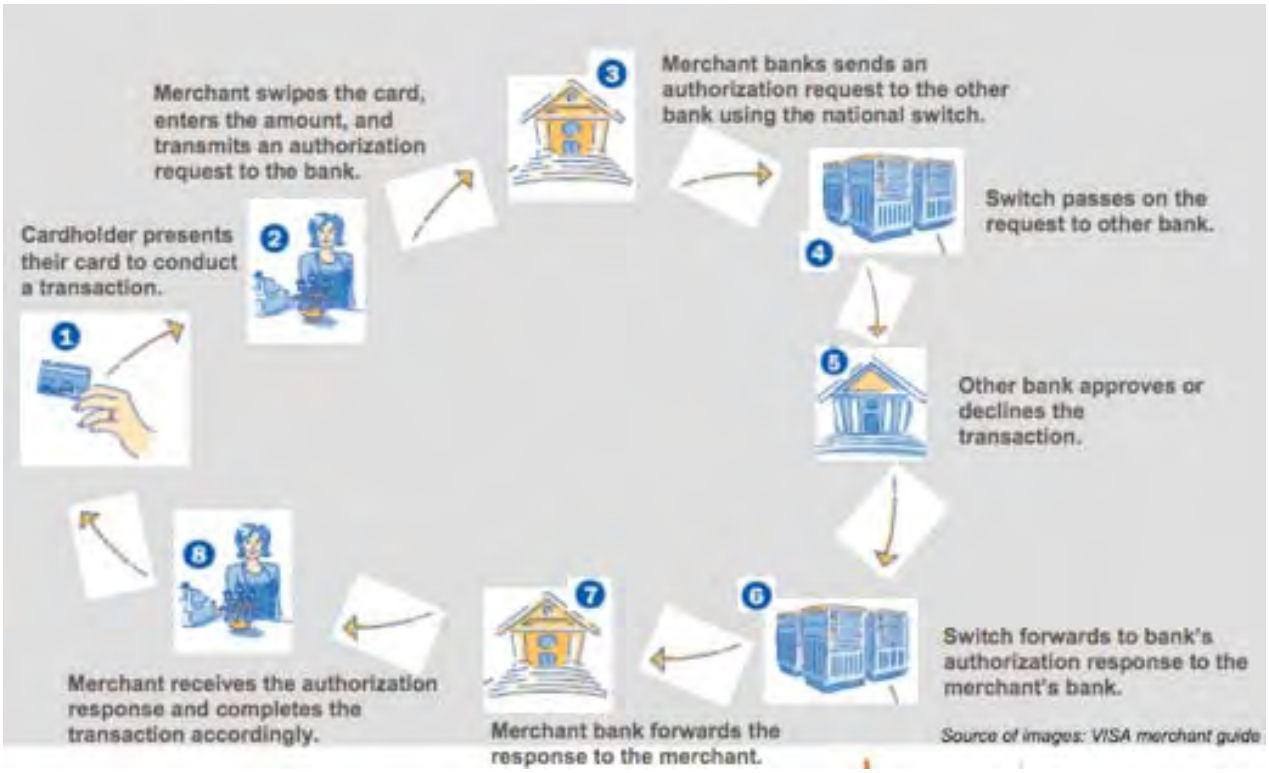
Cyndeo, LLC – United States *(www.cyndeo.com)*
Cyndeo has begun a global offering for agent-led models that operates as a kind of independent payment platform. The ESE platform, which is based on work done in Uganda with microfinance organizations, is now being applied in various other countries and transactional applications. This is a low-cost solution aimed at the bottom of the pyramid (BoP) market, and can plug into POS and telephony devices, with mag stripe or smart cards for authentication or transaction storage. The smart-card value card solution, aimed as it is at microfinance operations, seems well suited to the environment in areas Pakistan where reliable connectivity is a significant problem.

Agent-Led Model Use Cases

In an agent-led model, the agent does the transaction as one of many during the day. The agent may do this financial transaction as a primary business activity or a side-activity as part of an existing business. For example, pay-phone operators in Pakistan are performing dozens of transactions per day, all of them in cash. If such operators became authorized agents of a microfinance institution, the use of technologies such as POS devices or smart-cards helps resolve many of the operational and credit risks associated with the model.

> "What makes branchless banking work are information and communication technologies that customers, retail agents, and banks or non-bank e-money issuers use to record and communicate transaction details quickly, reliably, and cheaply over vast distances." (CGAP, Focus Note 38)

By way of illustration, a Visa card transaction is a type of model that relies on third party agents, shared infrastructure, and arrangements between the participating banking institutions. (see figure below). The cardholder is issued the card from the "issuing bank" but may use it at any place displaying the Visa sign. Such agents have been pre-approved by Visa to follow certain procedures, for example, to check for identification. The merchant sends a request for authorization of a transaction, which is transmitted over a phone line or internet connection to the bank which has issued the merchant the POS device. The merchant's bank sends the request via the switching network to the card issuing bank for approval and then the response comes back by the same path.



To further illustrate, three different models, using different combinations of cards, mobile phones, and POS devices are described below:

1. Credit or debit cards with POS terminals
2. Mobile telephony with SMS transactions

3. Smart cards with POS terminals

Credit or Debit Cards with POS terminals

Disbursement and Withdrawal (cash out)

The customer is approved for a loan via normal underwriting procedures by the microfinance institution. The institution issues the authorization, which updates the merchant network (cache servers). When the customer arrives at an authorized agent location with a POS device, the customer presents proper identification and swipes their mag-stripe card or inserts their smart card and authenticates with a PIN or transaction code. The merchant's POS, part of a network, dials up the network's switch and requests confirmation for a transaction of specific amount. The transaction confirmation code is confirmed to the merchant's POS, and the merchant makes a record of that. The merchant hands over the cash and generates a receipt. The receipt may also need to be signed by the customer as an addition control.

Loan repayment or Savings Deposit (Cash-in)

The customer arrives at the merchant location (agent) with a microfinance institution (MFP) account number and personal identification. The merchant enters the MFP number as part of an account number and the amount to be paid. The customer hands over the cash and the agent-merchant creates a receipt either directly from the POS or manually. The receipt must have the transaction confirmation code to be valid.

Note: This scenario describes an alternative where the customer does not need a card. However, loan repayments and savings deposits can also be performed with mag-stripe or smart cards as described above in the disbursement scenario.

Mobile Telephony with SMS Transactions

Disbursement or Withdrawal (Cash-out)

The customer is approved for a loan by the field officer per the methodologies of the microfinance institution. The field officer communicates this to the branch and the customer account balance is updated in the back-office systems.

- Option A: The field officer sends a message via SMS to the back-office system which is SMS enabled. This approval transaction creates a log entry in the back-office database and updates the approved amount in the customer's account (credit line or debit account).

- Option B: The field officer takes paper forms to office and data is entered directly there.

- Option C: The field officer sends the SMS as in option A, and then follows up with data entry to verify all customer information, and conforms to other controls.

The customer can then use SMS via their mobile phone (or SIM card in an available phone) to transfer the amount to a third party who also has a bank account and sufficient cash on hand to provide the cash. The third party provides the funds at the same time that the customer transfers the amount online. This process may involve additional levels of authorization. For example, the customer may need to provide a special code to the agent who then enters that as part of the message, which becomes part of the record maintained by the telecom

on behalf of the agent.

Loan repayment or Savings Deposit (Cash-in)

The customer purchases "cash-in" tokens from a verified third party agent in some readily available form. These agents will be authorized by the mobile phone carrier on behalf of the microfinance institution to carry specific cash-value scratch-style cards. Alternatively, the agent may merely have the ability to take cash and transmit, on behalf of the mobile telecom, the value to the phone of the client/customer.

- Option: The customer must show evidence of account with the specific microfinance institution and the agent must make a "sales record" of cash-in transaction. This record will also need to be communicated by SMS to the mobile carrier to enable a cash reconciliation and recording for regulatory purposes. In the scenario where the cash is transmitted into the mobile phone account of the customer and thence from the customer to the microfinance institution, there is an additional issue of ensuring that the customer actually carries through with that transaction and has a receipt to show.

The customer then enters the codes on the scratch card and the token amounts (can be done on premises of 3rd party agent) are then physically transferred from the mobile carrier to the customer's account. This account can be either held by the microfinance institution or the telecom provider.

The scratch cards serve as a kind of control - providing traceability of cash payments on loans and deposits – but are not an essential component. Securing scratch cards could actually introduce an entirely new set of issues around tying up capital in issued cards and regulatory concerns over that float.

Smart Cards with Point-of-Sale Terminals

From the client's perspective, a transaction starts with the POS terminal and the smart card that acts as the client's secure passbook. The smart card acts as the ultimate transaction record, with all other records needing to be synchronized with that local data source. A brief description of how this transaction process can occur follows:

- A client arrives at authorized POS terminal with their authorized smart card, additional ID if required, and the cash that will be deposited or applied to a loan
- The agent initiates a transaction through the POS by inserting her smart card into the terminal thus authenticating the terminal and its association with that agent
- The client inserts their smart card into the POS terminal.
- The type of transaction – savings deposit, loan payment – is selected
- The amount of payment is entered into the POS
- A screen appears requiring both the agent and the client to confirm the transaction type, account number, and amount.
- Upon acceptance of the transaction, the POS device prints two receipts – one for the client and another for the agent.
- In an online solution, these activities take place in real-time. In an offline solution, which is required in areas of erratic electricity and connectivity, transaction data is stored on the POS device until it is uploaded at the end of the day.
- At the end of the day, the agent performs a series of processes that include reconciling their cash on hand with a summary report
- The microfinance institution's accounting personnel dial into the transaction server to capture the transactions that occurred during the day so the MIS can be updated. Depending on the sophistication of all the elements of the system, this process can be real-time, automated, or manual.

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