Automated Teller Machines

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Automated Teller Machines (ATMs) conduct many transactions that would otherwise require staff attention: they furnish account information, accept deposits, draw down on pre-approved loans, and transfer funds. The use of ATMs frees loan officers to focus on personalized services, and the machines can potentially deliver a broader range of services. ATMs are most effective for microfinance institutions (MFIs) that accept savings and want to serve customers in multiple locations and/or during non-business hours. But since a single machine can cost as much as US$ 35,000 and requires reliable electric and communications connections, ATM technology may not be the first choice for all MFIs.

Who Should Consider ATMs?

MFIs generally consider ATMs when high transaction volumes put pressure on staff, traditional operating hours do not suit client needs, and regulations permit MFIs to offer a range of financial services. The technology only becomes attractive if an institution accepts savings, since the up-front investment in an ATM network is too high to justify using it only for loan disbursements. Some MFIs may want to consider ATMs or other simple card-reading and balance-reporting networks to reach rural customers or a dispersed population. For these institutions, locating an ATM in a market center may be more cost effective than opening a branch there.

How Do ATMs Work?

Typical ATMs have two input devices (a card reader and keypad) and four output devices (display screen, cash dispenser, receipt printer, and speaker). Not visible to the client is a communications mechanism that links the ATM directly to an ATM host network. The ATM functions much like a PC; it comes with an operating system (usually OS/2) and specific application software for the user interface and communications. Whereas most ATMs use magnetic strip cards and personal identification numbers (PINs) to identify account holders, other systems may use smart cards with fingerprint validation. (See the **Biometrics Technology** and **Smart Card** articles in CGAP's IT Innovation Series for more information.)

The ATM forwards information read from the client's card and the client's request to a host processor, which routes the request to the client's financial institution. If the cardholder is requesting cash, the host processor signals for an electronic funds transfer (EFT) from the customer's bank account to the host processor's account. Once the funds have been transferred, the ATM receives an approval code authorizing it to dispense the cash. This communication, verification, and authorization can be delivered several ways. Leased line, dial-up, or wireless data links may be used to connect to the host system, depending on the cost and reliability of infrastructure. The host systems can reside at the client's institution or be part of an EFT network. The EFT network

may support debit card transactions using PINs, or credit card transactions using a signature. Point-of-sale services that use PINs are also possible. EFTs often have a regional scope, such as A Toda Hora (ATH) in Puerto Rico, which focuses on the Caribbean and Central America.

Requirements for ATMs

- Reliable electrical power and communications infrastructure
- Affordable dial-up or leased line rates for the ATM to send and receive data
- A central database where client data must be stored for balance verification
- Reliable after-sales servicing and support from the vendor or third-party
- Solid operational procedures and resources to distribute cards and control PINs
- Supply of correctly denominated currency
- Systems to securely transfer cash to ATMs
- Adaptations for effective usage, such as building-in verbal instructions to guide illiterate users

Benefits and Costs of ATMs

Benefits

- Flexible account access allows clients to access their accounts at their convenience.
- MFI personnel are not required to be present for transactions and have more time to serve clients.
- Increased hours of operation fit client schedules.
- More clients can be reached beyond the branch network, such as in smaller population centers.
- More low-cost funds are available because ATMs make it easier for clients to deposit savings.

Costs

Costs differ depending on the technology provider and how the ATM network is operated. If an MFI can partner with an existing ATM network and/or network operating company, the MFI's operating expenses will be less.

- Up-front equipment acquisition cost or network participation fee
- Set-up fee to install and network the ATMs
- Usage fee, either per transaction or on a monthly basis
- Monthly or annual service fee for support
- Communications charges for dial-up, leased lines, or wireless data links

Initial costs are high, particularly if the institution is establishing a self-supported network. Individual ATM purchase prices are US$ 20,000–$ 35,000. Magnetic cards cost US$ 0.25 to US$ 0.50 each, and smart cards usually run US$ 6–$ 10 each. ATMs that use smart cards do not require a real-time Internet connection, since the ATM can obtain some client financial data from the microchip on the smart card. The microchip or wireless internet service may be required where communications systems are expensive or unreliable.

Microfinance Implementations

Prodem FFP in Bolivia, Banco Ademi in the Dominican Republic, and MEB Kosovo have each introduced ATMs in different ways to meet the needs of their unique client populations, communications infrastructures, and costs of participating in ATM networks. In-depth impact studies of the benefits of ATM technology are not available, but two major benefits may be identified.

Prodem FFP (Bolivia)

Serving 43,000 clients who live mostly in rural or semi-urban settings, Prodem FFP has installed 20 Smart Automatic Teller Machines (SATMs) inside its branches. These SATMs are unusual in that they incorporate fingerprint readers for client verification rather than use PIN technology. They also use voice instructions in three languages to assist illiterate or semi-literate users. (Details of Prodem FFP's smart card and biometric security implementations are available in the **Smart Cards** and **Biometrics Technology** articles of the CGAP IT Innovation Series.)

One year after deploying smart cards, Prodem FFP offered clients the option of conducting cash transactions through an ATM. Because the smart card's chip contains all essential client financial information, transactions are immediately reflected on the card, and the ATM only updates data to the central processing site twice a day. Prodem FFP has saved about US$ 800,000 per year in Internet access charges by using Smart Cards instead of

cards with magnetic strips, which require real-time connection. Smart Cards also reduce the risk of fraud at Prodem's central office because only the cards carry the client's latest financial data. Prodem FFP used Innova Empresarial, a local firm, to integrate the Smart Card, biometric reader, screen, and cash dispenser, and kept the price for each machine below US$ 20,000. The organization plans to increase its ATM network to 36 machines by the end of 2003 and to install ATMs in all 54 branches by June 2004.

For Prodem FFP, the primary benefit of the ATM network was greater convenience for customers and increased deposit mobilization. Customers used the ATMs for many transactions that previously required staff attention, and were able to conduct business in many locations. In turn, this makes it more convenient for clients to save, which increased the volume of deposit funds available to the institution.

Banco Ademi (Dominican Republic)

Banco Ademi took a different approach by partnering with A Toda Hora (ATH), an EFT service provider that operates a network of 1000 ATMs. Other banks own the ATMs supported by ATH, but cardholders of Banco Ademi's *ADEMI+* debit card can use any ATM in the system. Clients pay a charge of about US$ 0.20 per transaction, which is shared by the ATM owner and ATH.

Participating in a third-party network was attractive to Banco Ademi because the entry fee was reasonable, and the ATM locations closely matched the institution's service area. ATH charged an initial fee of US$ 10,000 and an annual membership fee of US$ 2,400. Implementing ATM technology cost Banco Ademi less than US$ 70,000, and it purchased and installed a single ATM in its largest office to learn more about ATM operations.

ATM technology has enabled Banco Ademi to give its 28,000 clients more convenient service by providing 24-hour access to funds via a wide network of locations. The institution's staff was also free to handle more personalized customer interactions, rather than routine deposit-taking and balance-checking.

MEB Kosovo (Kosovo)

With more than 110,000 customers after only four years of operation, MEB Kosovo turned to ATMs to help its overburdened network of seven branches. With little time to conduct research, it contracted a system integrator, Compass Plus of Russia, to design and implement an ATM network to support its rocketing client demand and provide 24-hour service. Since regional communications infrastructure was unreliable, MEB elected to use wireless connections to its central processing servers. It also installed ATM wall units rather than stand-alone models for greater security. Compass Plus provided the ATM management software to govern and monitor transactions.

Although MEB Kosovo's investment in the first 17 ATMs cost US$ 1.5 million, the technology fit the mission of its parent company, the IMI investment group. IMI's philosophy is to create "greenfield banks" that can furnish complete banking services from inception. It considered ATMs the best approach to managing MEB Kosovo's client growth, and is leveraging the MFI's experience to benefit other subsidiaries. MEB Kosovo is furnishing ATM management services for a sister institution in Albania, FEFAD Bank. It is also broadening its own network by placing point-of-sale terminals in supermarkets and shops.

Lessons for Implementation

Identify a provider committed to your market

Prodem FFP found that the price quoted by global manufacturers of ATM equipment to add biomet-

ric or voice applications was prohibitively high. An substantial order was needed to attract companies that usually serve the commercial banking sector. Locally, Prodem FFP found a system integrator to design a solution for under US$ 20,000 per ATM that used resources best suited to Prodem FFP's clientele. Although a local provider may have more familiarity and commitment to the MFI's market, not all such providers are stable companies or able to provide reliable technical support. In many countries, MFIs may not find the necessary expertise to implement home-grown systems.

Leverage existing resources

Banco Ademi was able to partner with an existing ATM network and operating company to avoid the full capital investment and operating burden of self-supported ATMs.

Test feasibility with a pilot or phased implementation

Acquiring a single machine for its busiest branch helped Banco Ademi's management introduce ATMs gradually. Installing one ATM to test the feasibility of this technology can help an MFI measure management's commitment, ease of client adoption, and adequacy of physical infrastructure.

General guidance

ATMs introduce a further level of complexity for operations staff although it saves staff time overall. Even in areas where infrastructure is reliable, many practical challenges must be addressed as demonstrated by the mainstream banking sector.

- Buildings may have to be modified to accommodate ATMs.
- ATMs need to be protected physically, particularly for 24-hour availability.
- Cards and PINs need secure administrative procedure to protect against internal and external fraud.
- ATMs require maintenance and trouble-shooting services by reliable third-party support companies.
- Cash replenishment requires security, set schedules, and correctly-denominated currency.
- Options to help illiterate clients need to be designed.
- Networking options and costs may include dial-up, leased line, or wireless Internet connections.
- Existing processing and management reporting systems need to interface with each other.
- Hardware, software, and communications require support and ongoing upgrades.

To Learn More

ATM technology providers

Fujitsu, **http://www.fujitsu.com**
NCR, **http://www.ncr.com**
Diebold, **http://www.diebold.com**
Olivetti, **http://www.olivetti.com/**

Systems integrators

Innova Empresarial,
http://www.innovaempresarial.com
Compass Plus, **http://www.compassplus.com/**

Network operators

A Toda Hora, **http://www.ath.com.do/**
GM Group,
http://www.gmgroup.com/index.htm

CGAP has not reviewed their products nor does it endorse them in any way.

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Other resources

World Resources Institute's *Digital Dividend Project,* **www.digitaldividend.org**