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FS SERIES #9: ENABLING MOBILE MONEY INTERVENTIONS

PRIMER

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ACRONYMS

AML	anti-money laundering
ARIES	Agriculture, Rural Investment and Enterprise Strengthening
ATM	automated teller machine
B2B	business-to-business
BSP	The Philippines's Central Bank
CFT	combating the financing of terrorism
CGAP	Consultative Group to Assist the Poor
DAB	Da Afghanistan Bank
DFID	U.K. Department for International Development
EGAT	Bureau for Economic Growth Agriculture and Trade
FS Share	Financial Sector Knowledge Sharing Project
G2P	government-to-person
GSM	global system for mobile communications
GSMA	Groupe Speciale Mobile Association
GXI	G-Xchange (Globe Telecom)
ICT	information and communications technologies
IFC	International Finance Corporation
IVR	interactive voice response
KYC	Know Your Customer
MABS	Philippines Microenterprise Access to Banking Services
m-banking	mobile phone banking
MFI	microfinance institution
MFS	mobile financial services
m-money	mobile money
MMT	mobile money transfer
MMU	Mobile Money for the Unbanked
MNO	mobile network operator
m-payments	mobile phone payments
MSP	money service provider
MTZL	Mobile Transactions Zambia Limited
m-wallet	mobile wallet
NBC	National Bank of Cambodia
P2B	person-to-business
P2P	person-to-person
POS	point-of-sale
PROFIT	USAID/Zambia Production, Finance, and Technology
RAF	rural and agriculture finance
RBAP	Rural Bankers Association of the Philippines
SIM	subscriber identity module
SMS	short message service
STK	SIM toolkit
telco	telephone company
USSD	Unstructured Supplementary Services Data
WAP	wireless application protocol

FOREWORD

In 2006, mobile financial services worldwide were in an early phase: Pioneers in places such as Zambia, the Philippines, and South Africa had launched, but not yet come to scale. At that time, we first wrote explicitly about how donors could assist the process.

Four years later, much has changed. Successful m-payment services like M-Pesa in Kenya (which was supported by a donor in its early development) are no longer pioneers but have reached great scale, demonstrating the potential for rapid take-up and commercial success. But these success stories are not yet widespread. So, it is timely that Chemonics/FS Share has again assessed the lessons of emerging good practice for donors in this fast-changing area, providing case studies of different types of engagements. This note provides a useful, concise introduction for program officers seeking to promote the spread of mobile financial services, unlocking their potential to expand access to financial services with transformational effect.

David Porteous
Director, Bankable Frontier Associates LLC

INTRODUCTION

In 2008, USAID's Bureau for Economic Growth Agriculture and Trade (EGAT) created the Financial Sector Knowledge Sharing Project (FS Share). This project was designed specifically to collaborate with USAID missions to develop effective and efficient financial-sector programs that increase access to financial services and develop well-functioning markets globally. USAID awarded Chemonics International Inc. the FS Share delivery order under the Financial Sector Blanket Purchase Agreement. FS Share has a three-year period of performance, July 2008-2011.

Through the FS Share task order, USAID EGAT and Chemonics proactively collaborate with missions to identify financial-sector priorities and develop strategies and programs for growing the financial sector. FS Share identifies financial-sector best practices and aggregates them through model scopes of work, primers, diagnostic tools, best-practice case analyses, and other tools. These deliverables are disseminated to USAID missions for use in financial-sector programs. FS Share can also assist with implementation and connect mission staff to external resources on best practices. In response to mission demand, FS Share delivers presentations and other knowledge-sharing endeavors.

Objective of This FS Series

The objective of this FS Series, "Enabling Mobile Money Interventions," is to provide U.S. government program designers with a basic technical understanding of mobile phone banking (m-banking) and mobile money (m-money) transfers (MMT) and how to design approaches to increase access to financial services that promote financial inclusion. The FS Series includes a primer, a diagnostic checklist, and two model scopes of work. The primer introduces, defines, and provides an overview and case examples of m-banking and MMT.

This FS Series was developed by Anna Bantug-Herrera and Shailee Adinolfi of Chemonics International and reviewed by David Porteous of Bankable Frontier Associates and the FS Share project management team.

FS Share Rapid Response Hotline

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EXECUTIVE SUMMARY

The objective of this primer is to provide U.S. government program designers with a basic technical understanding of m-money interventions, specifically m-banking and MMT, and how to design and implement approaches that will increase access to financial services in rural areas.

The convergence of mobile communications and financial services has the potential to significantly increase access to financial services to individuals at the base of the pyramid. M-banking is a potentially powerful platform for delivering financial services if 1) a commercially viable business model and strategic, sustainable partnerships with the private sector can be established, 2) there is an appropriate regulatory environment for such transactions, and 3) there is sufficient market demand in the target market. M-Banking and MMTs have the potential to enhance the impact of a wide range of USAID programs, including microfinance, rural and agricultural finance, trade and competitiveness, social transfers and cash-for-work programs, and other economic growth programming.

Based on the cases analyzed for this FS Series, a number of core elements can be considered "good practice" programming for supporting m-banking activities. As with any new financial product, it is important to conduct market research as a first step to identify opportunities and better understand the potential clients and market. Identifying and developing relationships with private-sector partners, specifically mobile network operators (MNOs) and financial institutions, can help to leverage existing funding and is a significant step toward long-term sustainability. Engaging with regulators to clarify the enabling environment for m-money is critical and should be initiated as early in the product development process as possible.

M-money interventions may focus on one actor or engage several stakeholders, including MNOs, financial institutions, regulators, and clients. There is a need for capacity-building of regulators, and in some cases, the providers themselves. Because m-money is a relatively new product in most countries, financial education and targeted marketing may be helpful. In order to enhance prospects for sustainability, scalability, and possible replicability of these approaches, initiatives need to promote holistic ecosystem[1] development and plan for the eventual interoperability of systems to allow usage by multiple banks and multiple MNOs. A detailed summary of key considerations for program designers and implementers can be found in Section D.

[1] As defined by the IFC, m-money ecosystems are the networks of organizations and individuals (e.g., banks, MNOs, and agents) that must be in place for m-money services to take root, proliferate, and scale up.

PRIMER

This primer's objective is to provide USG program designers with a basic technical understanding of m-money, specifically m-banking and MMTs, and how to design approaches to increase access to financial services utilzing these innovative tools. This primer defines m-money and mobile financial services (MFS), and describes how access to finanical services via mobile phones can increase financial inclusiveness. It is based on field visits and an extensive review and analysis of existing literature and resources, lessons learned, trends, and approaches, including approaches used to implement USAID and non-USAID programs.

Section A provides an overview of m-banking and MMT, including how they work, definitions of MFS, and descriptions of the prevalent business models and products and services. It also discusses intersections among programming in microfinance, rural and agricultural finance, trade and competitiveness, and cash-for-work programs and social transfers. Finally, it summarizes USAID's and other donors' programming, including grants and contracts, that includes interventions to develop m-money solutions for the unbanked.

Section B summarizes successful approaches and remaining challenges in key areas in m-banking and MMT: enabling environment; agent, networks and channel management; developing partnerships and ecosystems; products and services; targeting specific markets; and information and communication technologies (ICT) requirements and technology options. This is not an exhaustive list, but does describe some of today's most critical issues in m-money interventions.

Section C highlights case analyses of recent donor-supported m-money interventions that provide useful lessons for program designers. These case analyses include programs and models supported by USAID and other donors in Asia (Afghanistan, the Philippines, Cambodia) and Africa (Zambia, Tanzania); they focus on interventions designed and undertaken to increase access to financial services and results programmers can evaluate and from which they can learn. Annex C is a glossary of related terminology.

The diagnostic checklist in Annex A is designed to assist U.S. government programmers with evaluating the preconditions and options to consider when introducing m-money interventions as a mechanism to increase access to finance. Additionally, the two model scopes of work in Annex B provide sample language for program designers and implementers who are considering short-term or longer-term technical assistance. Both are practical tools for integrating lessons learned and best practices in MFS into effective programming.

A. Overview of M-Banking and MMT

M-banking could be a powerful platform for delivering financial services if 1) a commercially viable business model and strategic, sustainable partnerships with the private sector can be established, 2) there is an appropriate regulatory environment for such transactions, and 3) there is sufficient market demand in the target market. M-banking and MMT have the potential to enhance the impact of a wide range of USAID programs, including microfinance, rural and agricultural finance, trade and competitiveness, social transfers and cash-for-work programs, and

other economic growth programming (see Box 1). These services are some of the most rapidly growing initiatives in developing countries, enabled by: 1) the rapid growth of mobile network coverage and mobile phone ownership and 2) the fact that cheaper mobile devices, which enable remote transactions may have more effective outreach than physical bank branches (Bankable Frontier Associates, 2008). Although this innovative use of mobile technology is exciting, m-banking is just one channel to extend the reach of financial services to the poor.

Box 1. Why Consider M-Banking?

M-banking and MMT have the potential for large scale, sustainable development impact, particularly if programming objectives include:

- increasing financial inclusion
- targeting rural or unbanked populations
- leveraging private-sector partnerships
- increasing financial sector efficiency

In 2009, the global system for mobile communications (GSM) Association (GSMA) reported more than 4 billion mobile phone subscriptions globally, with 80 percent of new connections in emerging markets and mostly by lower income consumers. By contrast, only 2.2 billion of the world's population has a bank account (or access to financial services) (Financial Access Initiative, 2009). M-banking and MMTs have emerged as promising new approaches to accelerate financial inclusion and increase access to financial services. Although most m-banking applications provide a new delivery channel to existing bank clients, transformative models can integrate unbanked populations into the formal financial sector. According to the GSMA, as of March 2010, there were approximately 60 live m-money deployments and more than 87 planned deployments (Mobile Money for the Unbanked Deployment tracker, 2010).

However, harnessing the full potential of this mobile technology to "bank the unbanked" has proven to be challenging. Donors and m-money providers (e.g., banks, MNOs) are still trying to develop viable, sustainable business models that are replicable. This is particularly tricky given countries' varying conditions and requirements to offer the service successfully, including infrastructure requirements, enabling environment, scalable agent networks, and literate or tech-savvy populations. Program officers and implementers also need to consider the timing of their m-banking and MMT interventions. Several recommendations and considerations for program design are presented at the conclusion of this primer.

A1. Definition of M-Banking and MMT

The Consultative Group to Assist the Poor (CGAP), an independent microfinance center based at the World Bank, defines branchless banking as the delivery of financial services outside conventional bank branches using information and communications technologies and nonbank retail agents (e.g., using card-based networks or mobile phones) (CGAP, 2006). Thus, m-banking and MMT comprise one form of branchless banking and will be the primary focus for this primer[2].

Both of these services are part of a broader range of MFS. According to the World Bank, MFS refers to a range of financial services that can be offered across the mobile phone. (WB Private Sector Development Blog, 2009). M-banking and mobile payments (m-payments), including MMT, are a subset of MFS.

[2] For more information on branchless banking, please see the upcoming FS Share Series on this topic.

M-banking. M-banking is defined as the connection between a mobile phone and a personal or business bank account (WB Private Sector Development Blog, 2009). M-banking allows customers to use their mobile phones as another channel for their banking services, such as deposits, withdrawals, account transfers, bill payments, and balance inquiry (see Box 2). Although most m-banking applications in developed countries utilize the Internet, the majority of m-banking applications in developing countries utilize short message service (SMS) or text messaging to conduct the financial transaction via mobile phone. Most m-banking applications are **additive** in that they provide a new delivery channel to existing bank customers. **Transformative** models integrate unbanked populations into the formal financial sector.

Box 2. How M-Banking Works

Although it may differ slightly depending on the country, MNO, or financial institution, m-banking generally functions as follows:

1. A firm operates a system of electronic accounts subscribers can access with their mobile phones, usually using a subscriber identity module (SIM) application.
2. Clients' conversion of cash and electronic value ("cash in/cash out") is performed at network of retail stores or agents.
3. Electronic money can be stored on a phone (a.k.a., mobile wallet) or at a financial institution.
4. Transactions are recorded in real time using secure SMS and may be capped by central bank regulations (Mas and Ng'weno, 2009).

M-payments. M-payments encompass MMT (also called **person-to-person payments**, or **P2P**), **person-to-business** (**P2B**) payments, **business-to-business** (**B2B**) payments, or **government-to-person** (**G2P**) payments made with a mobile phone. **MMT** is a service whereby customers use their mobile devices to send and receive monetary value. Put another way, MMT is the electronic transfer of money from one person to another using a mobile phone. Both domestic transfers as well as international, or cross-border, remittances are money transfer services. (WB Private Sector Development Blog, 2009). **Mobile remote payments** involve using the phone as a mechanism to purchase mobile-related services, such as ring tones, or as a payment channel for goods sold online. Because **mobile bill payments**, such as payments to utility companies, tend to require interconnection with the receiving business' bank account, they are considered part of m-banking.

A2. M-Banking Intersections with Traditional USAID Approaches

Though there are promising applications for mobile technologies across all development sectors, this primer focuses on the increasing momentum behind the use of mobile phones as a tool to promote economic growth and, specifically, financial inclusion. In fact, it has been estimated that the convergence of mobile communications and financial services will see more than 1.4 billion people worldwide benefiting from mobile financial services by 2015.[3] This primer examines how the development and strengthening of MMT and m-banking can be integrated in broader development programs that focus on increasing access to finance for micro, small, and medium enterprises; rural and agricultural finance; trade and competitiveness; cash-for-work programs and social transfers programs; and other economic growth programming. In general, mobile applications and technology can be leveraged for development in many ways.

[3] Research by Edgar Dunn, a mobile banking and payments consultancy firm, in partnership with the GSMA, the global trade association for the mobile industry.

Incorporating m-banking or MMT into USAID programming does not mean replacing traditional approaches to microfinance or rural and agriculture finance, but rather offering alternative channels and solutions that may help in reaching target markets efficiently and effectively.

A2a. Microfinance

M-payments intersect with microfinance because the technology can be used to increase outreach to clients, particularly in rural areas, and deepen financial inclusion. With the increasingly large number of mobile phones being used in developing countries — including by microfinance clients — m-payments and, eventually, m-banking, are excellent options in microfinance's arsenal. Ideally, m-banking could be used as another "channel" or method to provide microfinance services to clients, including loans, deposits and insurance.

However, implementing m-payment and m-banking for microfinance has, in most cases, proven challenging and should be studied carefully before being integrated into a microfinance activity. Some of the issues that arose in past initiatives were: lack of IT infrastructure and human resources capacity within microfinance institutions (MFIs) and vague regulatory environments governing microfinance, electronic money, and payment systems (see Section B, p. 10).

A2b. Rural and Agricultural Finance (RAF)

MMT and RAF intersect in similar ways as in microfinance. It is often challenging to profitably provide RAF products and services due to long distances and high transaction costs. M-payments can bring down the cost of offering financial services to agricultural enterprises, farmers, and traders.

There are also related mobile applications that can be used for RAF, such as the electronic vouchers. Electronic vouchers are now being piloted in several African countries to allow poor farmers to obtain necessary materials at supply stores, without having to wait for and carry a piece of paper. The electronic voucher can either be sent directly to the farmer (if he has a mobile phone) or to the supply store, which can receive the voucher on the farmer's behalf.

A2c. Trade and Competitiveness

MMT can, in select cases, be integrated into programming to enhance trade and competitiveness. Specifically, m-money is an attractive payments solution to facilitate trade and exports, because it provides a safe, secure, and convenient way of transferring money and making payments. Regional traders and remittance senders may benefit from MMT to increase the efficiency and security of their transactions and reduce costs. For example, many traders in West Africa still do business via cash transactions and encounter challenges receiving payments on time and in full.

A critical prerequisite for MMT to facilitate cross-border trade is operational domestic m-money systems. Without them — and an enabling environment — it is difficult to develop more complex, sophisticated, cross-border systems because of regional enabling environment constraints and the lack of regional technological infrastructure (see Box 3, next page).

Box 3. West Africa Trade Hub Project's Mobile Money Transfer Initiative

West Africa is a highly interconnected region with about $10 billion in cash crossing borders annually. The goal of this USAID-funded initiative was to facilitate cross-border, multi-currency transactions over mobile phones, starting with Ghana, Nigeria, and Senegal, by targeting intraregional traders and remittance senders. There were a number of enabling environment challenges (regional bank settlements , regional forex convertibility and foreign exchange controls) and regional payment technological issues such as (switch, interconnectivity and regional roaming) encountered. There were significant constraints with the level of funding allocated and the contract vehicle used (see Section D). One of the lessons learned was the importance of not only appropriate resources and time but flexibility needed to adjust to the changing conditions on the ground (Carana, 2010).

A2d. Cash-for-Work Programs and Social Transfers

MMT offers another channel for the provision and safe transport of payments for cash-for-work programs and government-sponsored social transfers, including social safety net payments, conditional cash transfers, and pension payments (CGAP's Banking the Poor via G2P, 2009). Cash-for-work projects in conflict- and disaster-affected countries such as Afghanistan, Haiti, and Indonesia can demand payments to tens of thousands of individuals for a short period. Utilizing MMT provides a safe, secure way of making these payments without necessitating the transport of large sums of cash in the countryside.

Similarly, according to CGAP's Banking the Poor via G2P Payments Focus Note, because governments make regular payments to about 170 million poor people worldwide, MMT would be much cheaper than traditional arrangements, such as bank tellers. These types of G2P payments also have the potential to be transformational and reach unbanked people, such as lower income public-sector employees.

A3. Donor Support of M-Banking and MMT

Box 4. How Donors Can Help Support Mobile Money Initiatives

- Support pilot tests of m-money transactions for low-income or unbanked populations
- Conduct market research on viable business models and m-money products and services
- Provide technical assistance on policy and enabling environment
- Facilitate partnerships between banks, MNOs and third party providers
- Promote dialogue between regulators and m-money actors
- Promote financial education to target clients on m-money products
- Train banks and MFIs on the use of m-banking
- Providing revolving line of credit for "agent aggregators" to facilitate cash-out (see Tanzania case)
- Fund development of a technology platform

Donors have been exploring different approaches to using m-money to bring access to finance to people at the bottom of the pyramid for the past six years (see Box 4). In 2006, the U.K. Department for International Development (DFID) and the World Bank published "Mobile Banking: Knowledge Map and Possible Donor Support Strategies," which outlined what had been done and how donors could get involved. It stated that to move the m-banking industry forward, the following areas required attention: 1) more successful **transformational business models** that have reached financial sustainability to create a suitable demonstration effect; 2) systematic **information collection and knowledge dissemination** to guide potential entrants and policymakers; and 3) an **enabling policy and regulatory environment** that has sufficient openness and certainty to allow new models to start up and grow (Porteous and Wishart, 2006). Since then, donors have provided funding to support all three

areas, although additional assistance is still needed as the industry continues to evolve. In some countries, particularly in Latin America, donors have not been very active in supporting m-banking (instead they have been supporting branchless banking models) so it has been a mainly private sector driven initiative.

Some of the pioneering donors supporting m-banking have been DFID, USAID, and World Bank, including the International Finance Corporation (IFC) and CGAP. In 2003, DFID, through its Financial Deepening Challenge Fund, provided a challenge grant to Vodafone that helped create M-PESA ("mobile money" in Swahili) in Kenya and launched one of the most successful business models in this area. Since 2004, USAID has provided technical assistance on product development, enabling environment issues, and knowledge-sharing on best practices through its Philippines Microenterprise Access to Banking Services (MABS) program. In recent years, CGAP has become the leading organization in collecting and disseminating information on branchless banking, m-banking, and MMT for the poor.

Some of the most active organizations in m-money, including CGAP, the Bill and Melinda Gates Foundation (see Box 5), and the GSMA, have initiated grant programs. As of January 2010, the Gates Foundation's Financial Services for the Poor program had committed $470 million to public and private partners to make financial services widely accessible to the poor and help break the cycle of poverty (Gates Foundation, 2010). The GSMA Development Fund has initiated the Mobile Money for the Unbanked (MMU) programme to accelerate the availability of m-money services to the unbanked and those living on less than $2 per day. This includes a $5-million fund that awards innovation grants to support commercially viable and sustainable MNO-led projects that accelerate the deployment of m-money services for the mass market in developing countries. The fund seeks to accelerate the development of m-money services in terms of speed (i.e., the number of m-money deployments), scale (i.e., the number of subscribers), and sophistication (e.g., from individual platforms that enable cash transfers to interoperable platforms that enable savings, credit, and insurance).

Box 5. Gates Foundation's Grants Develop M-Banking Sector

Through its Financial Services for the Poor program, the Gates Foundation has provided a number of grants focusing on distribution channels (specifically agent networks), m-money, and savings banks/MFIs. In general, the foundation uses challenge exploration grants as a quick and simple tool, which requires applicants to submit short (two-page) applications online (Gates Foundation 2010). Winning grants are chosen approximately four months from the submission deadline.

Two of its most important m-banking grants have been a $23.8-million grant to CGAP over four years to find and promote new technologies, including agents, that will allow the microfinance industry to reach new clients and efficiently deliver services; and a $12.4-million grant to GSMA over three years to help develop sustainable mobile money solutions and support the MMU fund. These large grants have significantly assisted in developing m-money initiatives for the unbanked.

The U.S. government, through USAID and the Department of Defense, has supported branchless and m-banking initiatives. USAID, through its Philippines MABS project, supported the roll-out of a full suite of m-banking products using technical assistance, training, grants, subcontracts and public-private partnerships. USAID's Accelerated Microenterprise Advancement Project Knowledge Generation (AMAP-KG) project has funded feasibility assessments in Ethiopia, El Salvador, Nigeria, and Mexico to assess the viability of introducing or supporting m-banking. USAID has also directly implemented m-banking efforts in Afghanistan (see Section C, p. 17),

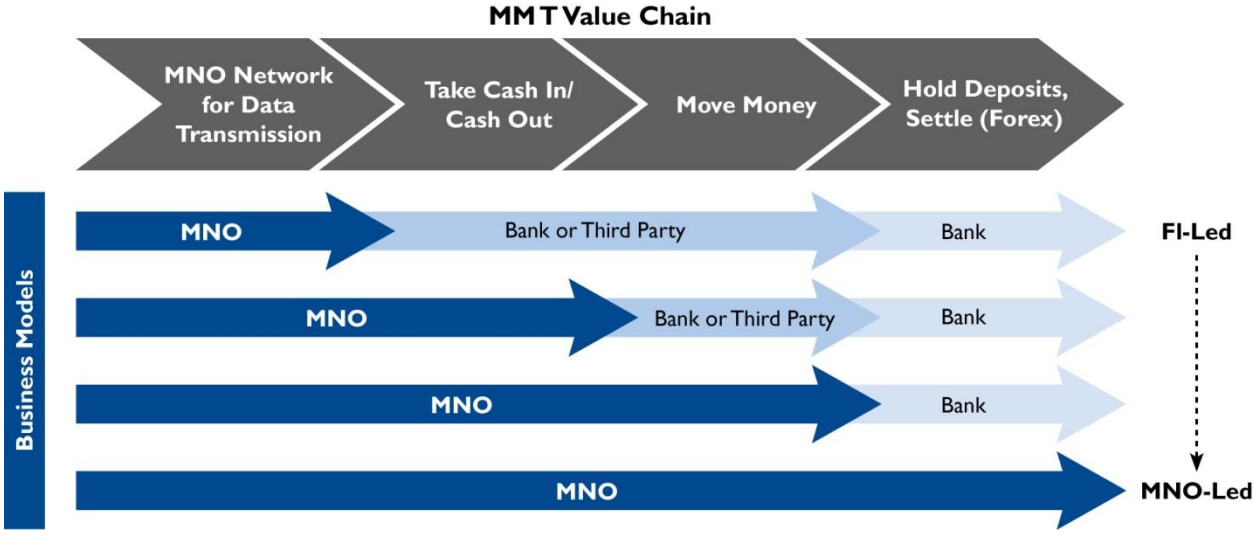
Colombia, and West Africa. Through the West Africa Trade Hub project, USAID pioneered the first initiative to facilitate cross border, multi-currency transactions over the mobile phone. Recently, USAID has explored m-money initiatives elsewhere, including Haiti and Malawi. The Department of Defense provided technical assistance to establish a shared m-banking platform in Iraq that is interoperable with multiple banks and telecommunications operators (telcos) (see B6., p. 15); it is exploring providing similar assistance in Afghanistan.

A4. Private-Sector Involvement and Prevalent Business Models

There are usually three or four main actors involved in m-banking: financial institutions, MNOs, third-party providers, and different types of retail agents. The business models for these initiatives can be categorized in four groups (see Exhibit 1 below) that generally describe which actor is in control of the revenue from m-money transactions: 1) bank-led, 2) telco or MNO-led, 3) joint venture/partnership and 4) third party-led. These business models depend on the following critical factors: volume (capturing a large number of relatively small transactions); speed (generating momentum among users and merchants); and coverage (being able to use it anytime to send money to anyone, anywhere) (Heyer and Mas, 2009).

It is also important to distinguish between bank-based and nonbank-based models from a regulatory perspective. In bank-based models, clients have a direct contractual relationship with a regulated financial institution; in nonbank-based models, instead of a relationship with a supervised financial institution, the client deals with a nonbank, such as a telco. (CGAP FN#43).

Exhibit 1. Business Models



Source: mPay Connect Consulting, MMT APAC presentation, 2009

A4a. Bank-Led Approach

In this model (FI-led approach in Exhibit 1), a bank offers financial services to its clients using a mobile phone as the platform. This is the model seen most often in developed countries, though it has been used in some developing countries. It tends to be additive (i.e., not transformative), because clients reached in this model are usually existing bank customers (Porteous, 2009).

There are a number of incentives for banks considering m-banking: reducing costs by using technology, increasing the client base, improving client retention (through greater customer satisfaction), and remaining competitive with other banks that offer m-banking. Additionally, an advantage for banks is that since it is already under the supervision of the regulator, it is familiar with key regulatory requirements such as Know Your Customer (KYC) and anti-money laundering (AML/CFT). However, the bank-led model is based on the assumption that clients have bank accounts. This is its major constraint to expansion in developing countries.

A4b. Telco-Led Approach

The telco-led model (see MNO-led approach in Exhibit 1) is widely known and has significant potential for transformational impact because using mobile phones as a channel for financial services allows outreach to the millions of clients who have access to phones but not bank accounts. In this case, the MNO may act as a de facto "bank" by providing MFS, usually MMT, to its clients. Probably the riskiest option — yet potentially the most profitable — this model places the most regulatory responsibility on the MNO. Some of the challenges of the telco-led model arise in navigating the regulatory environment and developing a viable agent network (see Section B, p. 10).

The incentives for MNOs to offer m-payment services directly are based on four main advantages:

1. reduced customer turnover or churn
2. better brand positioning based on service creation and innovation
3. distribution cost reduction
4. additional revenues from mobile transactions (cgap.org)

MNOs have also already established large distribution networks to sell air time to their low-income and rural clients, and they can leverage this to offer additional services (GSMA Annual Report 2009). Most important, the business model of mobile operators is to make profits from a high number of transactions with low margins, which is the same model needed for successful m-money initiatives.

A4c. Joint Venture/Partnership Approach

Increasingly, large MNOs offering m-money platforms are also investing in or developing joint venture agreements with banks to more rapidly increase the range of services and uptake of MFS. This model is attractive to financial institutions because they can reach out to large numbers of mobile subscribers who are not necessarily bank clients. (Microsave note #68). Examples include Telenor and Tameer Bank (Pakistan), Orange and BNP Paribas, and Orascom and Ora Bank.

This model may be beneficial because it permits cost-sharing between the MNO and bank. It also allows both parties to leverage each other's strengths (e.g., an MNO's brand recognition and a bank's knowledge of regulations). However, the pure joint venture model also faces challenges, such as who owns the customers and other governance issues.

A4d. Third-Party Provider Approach

This model entails outsourcing some of the bank's or MNO's functions to a third-party service provider. An interesting feature of this model, particularly for donors, is that it is MNO and bank "agnostic," and therefore could be established as an interoperable, m-banking system. Examples include PayPal or Obopay.

The main drivers for a third-party service provider are profitability and potential revenue. However, these firms face constraints, including high costs for technology infrastructure and platforms, low or no brand recognition, and (sometimes) vague regulatory environments. Furthermore, questions have been raised about the long-term sustainability of third-party providers and this model.

A5. Products and Services Offered via MMT and M-Banking

As mentioned earlier, MFS encompass m-banking and m-payments, including MMT. These typically offer the following:

MMT products and services. MMT enables electronic currency to be sent via mobile phone (P2P and B2P). **Domestic remittances** are a very popular way to use MMT. For example, Kenya's M-PESA (see Box 6) is a mobile-phone-based wallet (m-wallet) that enables users to send and receive money transfers from, for example, urban to rural areas. Governments can also use MMT to make payments to citizens, such as **social safety net payments** or pension payments. Such G2P services are being piloted in several countries. Similarly, companies can use MMT to pay employees' salaries (B2P). For example, organizations in the Philippines and Afghanistan are using mobile **salary payments** to pay their workforces in a timely, reliable manner.

Box 6. M-PESA's Astounding Success

M-PESA, a mobile phone based electronic payments system in Kenya that started in 2007, is one of the most successful examples of MMT globally. By late 2009, it had registered about 8.5 million accounts, which suggests that roughly 38 percent of the adult population has gained access to M-PESA in about three years (Jack and Suri, 2009). M-PESA has a network of more than 14,800 agents — nearly half of whom are in rural areas — who process about $320 million per month in P2P transfers (Mas and Ng-weno, 2009). Today, more than 200 companies, including utilities, use M-PESA to collect customer payments.

M-banking products and services. M-banking services are financial services that one would typically receive from a financial institution, (e.g., deposits, withdrawals, bill payments, balance inquiries, or loans). USAID's Philippines MABS project developed applications that enable microfinance clients to use SMS technology to conduct financial transactions via mobile phone (see Box 7, next page). **Loan payments** allow clients to cash in at local retail agents and send regular payments to banks using their mobile phones. **Withdrawals** allow clients to SMS an amount to their account at the bank and then cash it out at a nearby agent. For **deposits**, clients exchange their cash for electronic money at a retail agent, then SMS their e-money to their bank for deposit into their account. **Bill payments** enable clients to SMS a payment to a company that accepts electronic money, a utility, for example.

B. Analysis of Approaches Used and Lessons Learned

Below, we discuss successful approaches, and challenges and issues that still must be addressed.

B1. Enabling Environment

Regulating m-banking and MMT is widely recognized as one of the main issues and constraints facing the sector today. Much has been written about the topic, and CGAP has developed a diagnostic tool to help understand regulatory environments for branchless banking (see CGAP, Branchless Banking Diagnostic Template, February 2008).

Box 7. MABS's Suite of M-Banking Services

USAID's Philippines MABS project, in partnership with the Rural Bankers Association of the Philippines (RBAP) and G Xchange, a subsidiary of Globe Telecom, developed a robust suite of m-banking services for microentrepreneurs. The central bank has approved all of them:

- Text-A-Payment (loan payment)
- Text-A-Remittance
- Text-A-Deposit
- Text-A-Withdrawal
- Text-A-Billpay (bill payment)
- Text-A-Sweldo (salary payment)
- Text-A-Credit (loan)

B1a. Successful Approaches

Engage regulators early and continuously. In most successful m-banking initiatives — such as in Kenya and the Philippines — regulators were engaged early in the process of developing m-money products. This approach served to start a dialogue with regulators from the outset, whether or not m-money regulations even existed. By building this relationship and dialogue with regulators, firms have been able to open up discussions about vague or unregulated areas (e.g., agent networks, and KYC and AML procedures).

Identifying, anticipating, and managing risks. Because m-banking is relatively new, there are several types of policy risks associated with it, including risks to consumers, merchants, providers, and regulators. Proactively addressing and managing these risks is a good strategy for any m-money provider. For more details on risks related to MFS, see the Basel Committee on Bank Supervision's *Risk Management for Electronic Banking* and USAID's *Mobile Financial Services Policy Matrix.*

Encourage incrementality and proportionality. According to CGAP (Focus Note #43, 2008), a core recommendation for policymakers and regulators is to use proportionality as a guiding principle. In other words, regulatory responses should be proportional to the risks. Given that m-money is still in its emerging phases, there is consensus that regulations must be implemented gradually and designed to evolve as the industry expands and matures — an approach that seeks to respond to risks in the m-money space as they emerge (IFC, 2009). This will allow for oversight of this new and fast-growing industry without stifling innovation.

Streamlining KYC procedures. One of the stumbling blocks facing m-banking today is the efficient and rapid registration of new accounts and clients. In some countries, this KYC process, which usually includes verifying identification, can be outsourced to agents that are usually conveniently located in rural areas. In other environments, cumbersome KYC regulations require clients to travel to specific locations and/or tote numerous forms of identification, often discouraging account registration (Heyer and Mas, 2009). To encourage client registration, attempts should be made to simplify and streamline these processes as much as possible.

B1b. Remaining Challenges

Some regulators remain cautious and conservative about nonbank-issued electronic money; others are more open. Outstanding regulatory concerns include the regulation of nonbank agents, AML/CFT regulations[4], effective consumer protection, and rules governing competition among providers (CGAP Focus Note #43, 2008). There are also challenges to supervising mobile payment providers, which are only starting in most places (unlike the regulatory framework, which is increasingly in place). CGAP and Bankable Frontiers have done much research on regulating branchless and m-banking, and offer excellent resources. For examples of leading regulations, please refer to the UK's Financial Services Authority document on "The Regulation of Electronic Money Issuers" (2001) and the Central Bank of the Philippines' Electronic Money Issuer Circular (642/2009).

B2. Agents, Networks, and Channel Management

Another challenge for many parties interested in m-banking is developing agent networks. Effective distribution networks are essential to reaching critical mass in the m-money industry. Therefore, it is critical for m-money providers to maintain capable and stable networks of agents — typically the owners, operators, or employees of small retailers, or postal outlets that provide services (e.g., registration and cash in/out services) directly to consumers (IFC, 2009).

B2a. Successful Approaches

Building agent networks from existing airtime resellers. Small stores reselling airtime are ubiquitous in many developing countries, so this is a potentially strong channel, partly because they are already receptive to mobile technologies. Generally, working with these small firms is better than partnering with post office branches, which may be corrupt or mismanaged, and larger retail franchises, which may provide a good platform, but generally lack outreach in poorer villages in Africa and Asia (Heyer and Mas, 2009).

Creating attractive incentives for agents. Potential agents, including airtime resellers, need to be enticed with appropriate commissions and other bonuses to provide cash in/out services for MMT and m-banking. If the airtime reseller commission is too low, stores will not be interested in working with the MNO. Conversely, if the airtime commission is too high, resellers will not be drawn by the lower commissions of the cash in/out business (Heyer and Mas, 2009). In Kenya, Safaricom gave agents new-customer registration bonuses — 50 percent at sign-up and 50 percent after a client made his/her first deposit. This not only incentivized growth but also provided agents good cash flow in the early days, when transaction volumes were low (Mas and Ng'weno, 2009).

Channel management and use of agent aggregators. Safaricom built a channel based on the key requirements of profitability (incentives for agents), scalability (achieve rapid growth), and control (over brand and customer experience). Safaricom retained control over customers' experience with agents by hiring a subcontractor to be responsible for quality management. It also delegated some agent support activities, such as liquidity management and distributing agent

[4] Please see CGAP (www.cgap.org) for a more in-depth treatment on achieving compliance with AML/CFT.

commissions, to agent "head offices" or aggregators (see Box 8). Agents have consistent branding, received substantial on-the-job training, and were frequently visited and supervised (Mas and Ng'weno, 2009).

Box 8. M-PESA's Successful Channel Management Strategy

In 2009, Safaricom changed its channel management strategy to focus on scalability and efficiency. It has started to create "agent aggregators." These manage between 2000-4000 agents and are responsible for selecting, training, and supervising agents, managing agent liquidity, and distributing commissions. This structure decreases the number of agents M-PESA has to directly supervise and lowers the cost of agent management (Mas and Ng'weno, 2009).

B2b. Remaining Challenges

Many challenges remain in effective channel management and agent network development. These include creating appropriate commissions schemes, developing agent capacity (including liquidity management, or ensuring agents have sufficient funds available for "cash-out" clients' mobile transactions), building a "critical mass" of agents (e.g., enough to serve the market efficiently and thoroughly), and developing an ecosystem to support m-money and reach scale. To create appropriate incentives requires better understanding of agents, including their business model and drivers (IFC, 2009). Agent capacity — financial and human resources — can also be an issue as more clients use cash in/out services and agents take on additional responsibilities, such as KYC procedures.

B3. Developing Partnerships and Building Ecosystems

As noted in the Executive Summary, m-money ecosystems are the networks of organizations and individuals (e.g., banks, MNOs, and agents) that must be in place for m-money services to take root, proliferate, and scale up (IFC, 2009). They are characterized by interdependence and coordination among their actors, such as MNOs, banks, airtime sales agents, retailers, utility companies, employers, regulators, and donors. One of the early lessons learned in development of m-banking and MMT is the importance of productive, market-driven partnerships and alliances among these disparate actors.

B3a. Successful Approaches

Develop win-win solutions for both MNOs and banks. There are several successful examples of productive alliances between financial institutions and MNOs (see Box 9). These partnerships have demonstrated that MNOs and banks can work together and that each can leverage its core competence for the benefit of the partnership.

Acquisition of bank by an MNO. Over the last year, MNOs have purchased stakes in banks or looked to acquire their own banking licenses (CGAP, 2010). These include Telenor, which owns a 51-percent share in Tameer Bank; Orange and BNP Paribas; and Orascom and Ora Bank. This

Box 9. RBAP-MABS and Globe's Successful Alliance

Globe Telecom's G-Xchange Inc. (GXI) realized the importance of strategic alliances and partnerships when it was approached by the Rural Bankers Association of the Philippines (RBAP)-MABS program, which planned to help banks offer services that could be facilitated via the GCASH platform. This strategic partnership allowed both parties to build on their core competence and develop a full range of MFS, especially m-banking services, suited to meet the needs of low-income clients and customers of multiple member rural banks. On its own, each rural bank was too small to provide a sufficient value proposition for the MNO to work with them. As a group through RBAP, however, the banks shared a mobile banking platform and could provide a significant business proposition for the MNO (Microsave, 2009).

type of arrangement allows clear governance and management structures while building on the core competencies of both the MNO and the bank.

Ecosystem development through regular dialogue and engagement. Communication and collaboration are key to developing the ecosystem. It is important to sustain and diversify the opportunities for MNOs, banks, and third-party providers to share experiences and learn about business and technology innovations in m-money (IFC, 2008). At the same time, it is important to establish and support similar forums for regulators to exchange policy innovations across countries, such as the Windsor Global Leadership seminar, at which high-level policymakers and regulators discuss the best way to regulate innovative modes of financial service delivery to reach the poor.

B3b. Remaining Challenges

As the sector continues to evolve, one remaining challenge is to find a way to accelerate the development of the m-money ecosystem so it reaches critical mass (IFC, 2009). Scalability and sustainable ecosystem development are significant issues facing the sector now; they will continue to be issues in the future. Another challenge is promoting interoperability, which will allow multiple banks and multiple MNOs to participate in the m-money ecosystem.

B4. Products and Services

It has been noted that m-money products and services, particularly MMT, have a very clear value proposition: the ability to send money easily, cheaply and securely. Although these services are highly valued by clients, it is still important to spend sufficient time and resources at each stage of the product development life cycle, namely understanding customer needs, designing products (including branding and pricing), and piloting, launching, and commercializing products. It is also critical not only to focus on m-money adoption, but also the actual usage of these services.

B4a. Successful Approaches

Sequencing products and building on client familiarity. Some of the m-money services available today began as airtime top-up services. Introducing and familiarizing clients with this service first allowed MNOs to make clients comfortable with the concept of sending “airtime” or electronic value using their mobile phones. Once clients are comfortable with that, it is a fairly easy step to the concept of sending electronic money via mobile phone, which, as we have seen, is applicable to money transfers, bill payments, deposits, and other common transactions. Another logical step is to introduce the provision of MFS, preferably by partnering with a financial institution.

Importance of market research. Conducting thorough market studies to determine demand has been a critical success factor for many of the m-banking initiatives. To launch successful products and services, it is essential to understand consumer behavior and the market environment. For WING Cambodia, a payment service wholly owned by ANZ Bank, the IFC invested in market studies nine months before product launch, focusing on business model development, including a robust marketing strategy for technology uptake and m-banking, customer management strategy, and developing merchant and agent networks.

Develop appropriate pricing. It is important to price the products and services appropriately to encourage client uptake, particularly if they are being introduced in a country for the first time. Safaricom's pricing for M-PESA was designed to encourage customers to experiment: free and quick registration, free deposits, and the ability to send money to any mobile phone subscriber. Safaricom's profit margin is loaded on P2P and, increasingly, P2B transfer fees, not cash-in/cash-out free, reflecting that customer willingness to pay is higher for remote payments where alternatives are weakest (Mas and Ng'weno, 2009).

Building a strong brand. Strong brand development has been a critical success factor in several recent m-banking initiatives. Building a recognizable brand — by linking to an existing MNO or bank brand, or launching a new brand — has distinct advantages, such as creating awareness and building trust (Mas and Ng'weno, 2009). Key aspects of brand-building include communicating a simple message and developing an appropriate marketing mix.

B4b. Remaining Challenges

There are several issues surrounding introducing MFS and products. One of the bigger challenges has been to identify the differences between product adoption and actual usage. In some countries where m-money has been adopted relatively fast, actual use of the services has lagged. As noted above, there are challenges with effective pricing and cost structure. Additionally, because there are significant costs associated with marketing and building a brand, the source of funding must be identified.

B5. Targeting Specific Market Segments

Though much has been written about m-banking's potential to bank the unbanked, actually doing so has proven much more difficult. Reaching specific target markets, whether rural clients, illiterate populations, or the unbanked, has been challenging. Box 10 highlights one of the more effective strategies.

Box 10. South Africa WIZZIT's WIZZ KIDS

WIZZIT was founded in 2004 as a division of South African Bank of Athens and provides MFS, targeting South Africa's 16 million unbanked. WIZZITT does not have bank branches — it has a dedicated mobile sales force called WIZZ KIDS. WIZZ KIDS are young high school graduates from low-income communities who are hired to promote the product and help new users open their accounts.Because they are from the community, they can go directly to unbanked potential customers and sign them up for mobile banking . These WIZZ KIDS also provide ongoing support to customers, a strategy that underlies WIZZIT's success (GSMA MMU, 2009).

B5a. Successful Approaches

Developing customized solutions for specific groups. Several m-banking initiatives have included innovative ways of reaching specific groups. In Afghanistan, Roshan, the country's leading telecom operator, introduced M-Paisa, an m-banking service that includes an interactive voice response (IVR) system to address low levels of education and literacy. The IVR offers instructions in Dari, Pashto, and English, and clients can select which language they use.

Enabling accessibility through technology. Another way of reaching target groups is to increase and improve accessibility, which can be achieved in different ways. WING Cambodia, for

example, was intentionally developed utilizing a platform that would allow customers from any MNO to use the service. With nine MNOs currently operating in Cambodia, this is an important feature of WING. Also, because it was prohibitively expensive to offer m-banking services in Khmer-language characters, WING uses Romanized Khmer for its transactions. Baseline research conducted in 2009 showed that 56 percent of all WING customers were previously unbanked, a figure that is as high as 81 percent in rural areas (WING Social Report 2009).

B5b. Remaining Issues and Challenges

The biggest challenge is determining how to target and bank the unbanked using m-money. To date, it has been difficult to reach the unbanked, even when they have been specifically targeted. For example, 70 percent of respondents in a 2008 survey of M-PESA customers were already bank clients when they signed up for the service. More financial education may be necessary to increase some target groups' trust in the system and make them comfortable with m-money.

B6. ICT Requirements and Technology Options

There are four main technology components in effective mobile banking platforms:

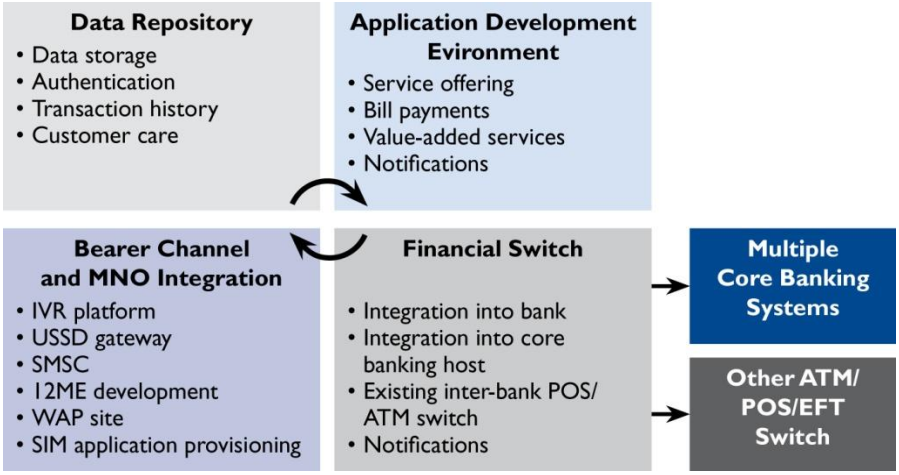
1. the data repository, where customer information is stored
2. the application development environment, which facilitates the development of services offered
3. the bearer channel, which is how users accesses the services from their mobile phones using applications such as SSMS, wireless application protocol (WAP), unstructured supplementary services data 2 (**USSD**2)
4. the financial switch, which integrates with the bank and inter-bank switch (see Exhibit 2, next page)

B6a. Successful Approaches

Bearer channel and client-side technologies should be user-friendly and affordable. Market research should be conducted to determine the most appropriate client-side technology for a given market. For example, in Kenya, M-PESA uses the SMS channel with **SIM Toolkit** (**STK**) technology on the phone; in Tanzania, M-PESA uses USSD. Both technologies work on every mobile phone in their markets, but the client interfaces differ. STK-based applications have a set of commands stored on the user's SIM card and the menu is embedded in the normal phone user interface, offering a high level of security. **USSD** does not require a SIM card, creating the potential for **interoperability** across all MNOs.

Balancing appropriate security technology and client convenience. Many concerns have been raised regarding the security of m-banking transactions and client data, especially regarding bearer channel security (see Exhibit 2, next page). Most of these concerns are related to consumer protection, and KYC and AML regulations. When selecting m-banking platforms, it is critical to ensure appropriate security and compliance with regulations while maintaining client usability and convenience. Though these systems need to be secure, they must also be accessible to client and easy to use.

Exhibit 2. Components of a Mobile Banking Platform



Source: FinMark Trust, 2007

Sharing technology platforms can reduce costs. When selecting the technology platform and bearer channels, consider the relatively large investment for maintenance and scalability of the services, and the potential for interoperability. Point-of-sale (POS), automated teller machine (ATM) networks, and payment switches can be shared (see Box 11), which costs less than negotiating exclusive arrangements between the network provider and a company or financial institution. Because most payment networks are priced based on the number of transactions, costs are lower for everyone when more institutions are involved on the network and the volume of transactions increases (Adinolfi, Payne and Petalcorin, 2007).

Box 11. Iraq's Multi-bank and Multi-Telco Model

As part of its efforts to improve business and stability in Iraq, the U.S. Department of Defense funded an innovative $2-million, two-year initiative to help develop a reliable banking sector to sustain economic development. It partnered with select private banks, assisting them in jointly investing in a **shared multi-channel electronic funds transfer switch** that would enable m-banking, and MasterCard/Visa POS and ATM services. The banks used their own funds to establish a retail payment consortium called AMWAL. The Department of Defense's contributed technical expertise in legal issues, information technology, and regulations. It also facilitated dialogue with regulators and third-party processors from the initiative's outset. M-banking features include a USSD user interface with P2P transfers, airtime top-up, and balance inquiry services. As of 2010, five banks and one MNO were participating in the system. More firms are expected to join shortly (Kris Haag, Department of Defense, 2010).

B6b. Remaining Challenges

How to develop interoperable systems. One of the issues that this sector has been struggling with is interoperability. Other than AMWAL in Iraq, there are very few initiatives that allow multiple banks and multiple telcos to participate in the system. This is a challenge for the future; when interoperability spreads, access to and usability of m-banking will increase.

Infrastructure still lacking in some countries. Some developing countries still lack the robust telecommunication or banking infrastructure needed to conduct m-banking transactions. For example, some countries do not have an interbank switch, a high-performance credit/debit

processing facility for all transaction processing needs. An interbank switch connects touch points (e.g., ATMs, POS, and mobile phones) to different end points, including banks, MNOs, and utilities. This allows electronic transfers of transactions among different financial institutions (including branches and service points), not just within a single institution. Having a switch is not mandatory for m-banking, but it is preferable because it helps extend the reach and usability of financial services.

MFIs may not have a core banking system nor sufficient human resources capacity. To reach out to rural and lower income groups, it is necessary to collaborate with the microfinance sector. However, some MFIs may not have a core banking system, which houses the customers' account and related transaction history information. This makes it difficult to process electronic transactions. A related constraint is the shortage of local vendors who can provide the necessary hardware and software and support systems.

Ensuring adequate data security. A breach in data security, especially over a fixed communication line, is possible if m-banking transactions are delivered through partially unencrypted communications protocols. Most protocols, including USSD, have encryption for part of the end-to-end transaction delivery process. The GSM network may be more secure than certain fixed-line communications (Krugel, p. 28, 2007). Information and statistics on the security of the technology options should be considered.

C. Case Analyses of M-Money Interventions

The cases for this primer (see Table 1, next page) represent m-banking and MMT interventions that were tested in the field and have demonstrated results. They were selected to illustrate recent donor interventions and approaches in the m-money sector. Three of the five programs were supported by USAID; all were assisted by different implementing partners. The cases represent regional diversity between Africa and Asia, an example in a conflict environment, and include best practices and lessons learned for programmers to consider.

Each case includes a synopsis of the country's background, m-money initiatives, and regulatory environment, and a description of the donor objectives and approach. Analysis of the results includes key findings and lessons learned, and a discussion of the possible sustainability and potential for replication.

C1. Roshan's M-Money Initiative in Afghanistan

C1a. Background and Environment

Afghanistan has a multi-ethnic population of about 30 million, about 75 percent of whom live in rural areas. Most industry is small scale and these businesses are of little interest to most commercial banks, leaving MFIs and numerous informal lenders as the only financial resources available to most Afghans. In fact, less than 3 percent of the population has a bank account. However, the microfinance sector has steadily grown over the last few years to 15 providers serving about 435,000 borrowers or savers through 307 branches in 26 provinces (MISFA update, 2010). There are four MNOs in the country and about 8 million individual active mobile

Table 1. Analyses on M-Banking/MMT and Donor Support

Intervention	Donor Involvement
Roshan M-Money Initiative in Afghanistan	USAID assisted in the development of m-money by engaging regulators on enabling environment; promoting m-banking knowledge-sharing and best practices; and attempting to pilot mobile payments for microfinance.
USAID/Zambia Production, Finance, and Technology (PROFIT) Project	USAID supported development of a third-party provider as a mobile payments system for rural farmers.
WING Cambodia supported by IFC	IFC supported WING's business model development prior to product launch and partnered with a large bank (ANZ) to launch an m-payments provider that works with multiple MNOs.
USAID/Philippines MABS project	USAID launched and developed a suite of m-banking applications for rural banks in partnership with the second largest MNO (Globe). It is focusing on capacity development of rural banks and providing guidance on enabling environment.
Vodacom's M-PESA in Tanzania	GSMA's MMU program, with funding from the Gates Foundation, is helping agents manage liquidity within M-PESA's agent network.

phone subscribers, for a penetration rate of about 24 percent (Roshan interview, March 2010). Roshan is the largest MNO; as of March 2010, it had more than 3.5 million subscribers and a market share of around 44 percent.

In February 2008, Roshan launched its mobile banking service, M-Paisa. Developed in partnership with Vodafone, the service enables registered customers to transfer funds using their mobile phones in a quick, easy, safe, and cost-effective manner for P2P transfer, repayment of microfinance loans, salary disbursement, and the airtime purchase of airtime. In October 2008, Roshan introduced IVR, which provides a voice-activated menu functional in English, Dari, and Pashto (USAID, 2008).

M-money transactions are regulated by the central bank (Da Afghanistan Bank, DAB) and its money service provider (MSP) regulations, which were revised in December 2009. Roshan worked with DAB early on to "leapfrog" some of the regulatory hurdles that legacy frameworks represent (IFC, 2008). M-Paisa is regulated and approved by DAB (USAID, 2008).

C1b. Donor Objectives

USAID/Afghanistan became actively involved in supporting the expansion of m-money through its $100-million Agriculture, Rural Investment and Enterprise Strengthening (ARIES) program. ARIES, implemented from September 2006 through December 2009, focused on expanding access to finance, particularly in rural areas, through development of the small- and medium-sized enterprise and microfinance sectors. ARIES identified m-money as an opportunity to help extend financial services in rural areas and partnered with Roshan to expand its m-payment services through MFIs in the ARIES network.

C1c. Approach

USAID/Afghanistan had been working with Roshan since 2007 to support the development of m-money in Afghanistan. USAID invested approximately $200,000 during the ARIES program, primarily on technical assistance to support the development of an enabling environment for m-money, promote knowledge-sharing, and fund pilots utilizing m-payments for microfinance (S.Charitonenko, ARIES COP, 2010).

Supporting an enabling environment by engaging regulators. Though DAB was initially supportive of m-money, in early 2009, several of Roshan's market trials were postponed to consider regulatory issues more carefully, in large part due to concerns voiced by the commercial banking sector. In May 2009, ARIES began working with the DAB Governor's Office to educate it about the sector, both from a market and a regulatory perspective. In July 2009, ARIES facilitated a meeting with the DAB governor, Roshan, and USAID; this helped reiterate the U.S. government's support for the sector and resulted in a significant improvement in the governor's opinion of Roshan and its planned roll-out of M-Paisa.

Promoting knowledge-sharing and best practices. In August 2009, USAID/Afghanistan sponsored an m-banking workshop, organized by ARIES, to discuss the central bank's general approach to regulating the sector and its proposed amendment to the MSP regulations to accommodate the expansion of m-money transactions. Participants included the DAB and other government representatives, donors, financial institution,s and MNOs.

Piloting mobile payments for microfinance. ARIES selected several MFIs with which to collaborate on piloting the use of M-Paisa for remote loan payments. ARIES staff spent about six months working with Roshan to develop training materials to support the roll-out of M-Paisa at BRAC Afghanistan and Oxus. Unfortunately, due to management and capacity issues at the MFIs, the pilots were delayed beyond the end of the ARIES project.

C1d. Results

Roshan's M-Paisa now offers a full suite of m-money services (see Box 12), including microloan payments for MFIs and P2P money transfers. As of March 2010, Roshan had 130,000 customers in Afghanistan using its M-Paisa system, and is adding between 500-800 new M-Paisa customers daily.

Box 12. M-Paisa's Products and Services

- Deposit cash into an M-Paisa account
- Withdraw cash from an M-Paisa account
- Send and receive money (transfers)
- Buy airtime
- Receive and repay loans (currently only with First Microfinance Bank)
- Receive salaries (currently used by all 150 Roshan employees and on a limited basis for Afghan National Police)

As a result of discussions with DAB and the workshop organized by ARIES, in November 2009, DAB adopted a revised version of the proposed amendment for MSP regulations. The workshop helped solidify DAB's support of the sector and its willingness to work with the U.S. government in the prudent expansion of m-money. DAB is likely to issue circulars to further refine the amended MSP regulation, particularly related to agent regulations and low transaction limits, but no substantial changes are expected.

C1e. Key Findings and Lessons Learned

C1e(1). M-Money System Design and Implementation

Importance of high-quality, expansive agent networks. Of the more than 3,500 Roshan agents across the country, only about 700 are trained on M-Paisa; of those, only about 300 are active M-Paisa agents. Sparse agent coverage has become a major constraint for M-Paisa's growth: If an agent trained on M-Paisa is not available, customers cannot complete a transaction. Another challenge is agent liquidity: If an agent does not have sufficient cash on hand, a client cannot cash out a transaction. It is not surprsing, then, that customer satisfaction with the M-Paisa agents is inconsistent.

Customize m-money products for local markets. Given the low level of education and literacy in Afghanistan, M-Paisa introduced an IVR system to their customer service that offers instructions in English, Dari, and Pashto. Customers can choose which language to they want to use. Farmers in the remote region of Badakshan, many of whom cannot read or write, are able to use the IVR to receive money (USAID, 2008).

Creatively address security concerns. Security continues to be a major operating challenge for Roshan, which invests significantly in third-party security services. Recognizing the importance of community support for countering insurgent attacks, Roshan instituted a community model in which villages participate in the construction of communication towers and are paid to guard them (USAID, 2008). There are now more than 100 sites under this model, with more sites being added each month.

C1e(2). Donor Support

Regular donor and partner coordination is critical, especially in conflict environments. Coordination with other donors, relevant government ministries, and private-sector partners is essential to ensure efforts are additive, not duplicative. This is especially crucial in conflict-affected countries such as Afghanistan, where donor programs tend to be large, implemented quickly, and have high staff turnover due to short-term rotations. A systematic communication process with a focal point of contact at the USAID mission is helpful to ensure coordination across all programming that may be complementary. USAID involvement is also helpful to entice private-sector participation, including cost-sharing, in interventions.

Building the knowledge and capacity of the regulators, financial institutions, and other potential market entrants to support m-money. It is helpful to share international experiences on the development of regulation and business models through workshops or conferences to ensure all stakeholders are aware of global m-money best practices. Similarly, focus on building the capacity of potential implementing partners, particularly MFIs, to ensure they have sufficient capacity (e.g., support from senior management and management information systems) to pilot the use of m-money. For example, insufficient internal capacity hampered ARIES' efforts to pilot M-Paisa by two MFIs in its final year.

Know your comparative advantage and develop programs accordingly. Multilateral development banks are usually best suited to providing loans for large-scale infrastructure investments (i.e.,

tens of millions of dollars or more). USAID, on the other hand, has a comparative advantage in providing matching grants, creating challenge-type funds, promoting private-public alliances, and funding specialized technical assistance and training. For example, since 2004, the Asian Development Bank (ADB) has provided about $170 million in loans to Roshan to expand its network reach, enhance network redundancy, and assist in providing additional value-added functionality (such as m-money services) (**www.adb.org**). Similar to ADB's phased approach, any funding or technical assistance support from USAID should be designed to be released on an iterative basis, depending on the recipient meeting time-bound and quantifiable benchmarks.

C1f. Sustainability and Potential for Replicability

Building the ecoysystem through salary payments. Roshan is expected to continue to self-fund pilots of expanded use of M-Paisa, especially with regard to rolling out its use for salary payments (see Box 13). Providing payroll services is a fast, efficient way to encourage the use of M-Paisa and build ecosystems.

Working with the microfinance sector. Roshan is working with First Microfinance Bank to provide microloan disbursement and payment services. Through March 2010, almost 7,000 clients were using M-Paisa out of about 40,000 total active borrowers. Of the bank's 21 full-service branches, 17 have M-Paisa-trained agents. First Microfinance Bank is pleased with the M-Paisa system and wants to expand its use among its clients. Because the system is already working with First Microfinance Bank, Roshan should definitely consider offering it to other MFIs.

Box 13. Roshan's Salary Disbursement Service

In late 2009, Roshan piloted use of M-Paisa to pay the salaries of around 50 members of the National Police in Wardak province. The trial was a success, despite having to overcome challenges such as a police commander who wanted the service shut down because he was no longer receiving his usual cut of the salaries. The police officers were surprised at how large the payments were when they received their full salary, which was a third higher than what they were used to receiving.

Roshan is now expanding its trialing of National Police salary payments via M-Paisa, from 50 to 200 officers in four districts of Khost and Wardak provinces. These payments are expected to be expanded from July 2010 to reach 13,000 officers by year's end. Roshan plans to continue to scale up salary disbursements to the National Police (which employs about 120,000 officers) and offer the same service to Afghan National Army soldiers in 2011.

Increasing competition. There may also be opportunities for donors to support other MNOs to enter the marketplace and create some competitive pressure that should accelerate market penetration and the use of m-money. For example, MTN announced in March 2009 that it intends to launch its revamped MTN Money product across "21 countries in sub-Saharan Africa and the Middle East," although it has not yet made any specific announcement regarding m-payments in Afghanistan. Etisalat Afghanistan does not offer m-payment services; however, Etisalat's corporate owner is also the parent company of Zantel in Tanzania, which recently launched the Z-Pesa m-payments product, so it is possible that it may eventually want to launch the same service in Afghanistan. Additionally, some Hawalas that offer small money transfers may provide competition for Roshan and others.

C2. Zambia PROFIT

C2a. Background and Environment

Zambia is a landlocked country with a population of 11.9 million, of which approximately 14.6 percent are banked by formal financial institutions. As of June 2008, there were 14 commercial banks and 71 non-bank financial institutions (Bank of Zambia, 2008). In contrast, there is a mobile penetration rate of 33 percent and a mobile phone subscription growth rate of 71percent (ITU Africa 2009 report).

Box 14. Zambia Demographics

- Labor force: 85 percent in agricultural sector
- Unemployment rate: 50 percent
- Literacy rates (percent): total population: 80.6; male: 86.8; female: 74.8 (2003 est.)
- Mobile penetration: 33 percent
- MNOs: Zain 74 percent; MTN 21 percent; Cell-Z 5 percent

(ITU Africa 2009 report; CIA World Fact Book; GSMA annual report, p. 2 of Zambia case study; Zain Zambia Preliminary Results to 30 June 2009; Finscope 2007)

In Zambia, there are two third-party providers offering m-money: Celpay and Mobile Transactions Zambia Limited (MTZL). Celpay is focused on providing money transfer services to businesses; their major services are B2B and P2B money transfers. MTZL is focused on providing MFS to the unbanked (MTZL Web site, 2010).

The Bank of Zambia is mindful of the potential for branchless banking in providing Zambians access to financial services, and they have been supportive of the innovations in this sector to date. It has approved MTZL as a designated payment system.

C2b. Donor Objectives

USAID/Zambia's PROFIT project is a six-year agricultural development program that focuses on integrating small rural businesses into commercial input and output markets as the means to achieve the broader objective of increased sector competitiveness in agriculture and natural resources. The project has a four-pronged strategy to strengthen the overall financial services sector and expand and improve the program's target subsectors' access to key financial services. (Rob Munro, Cardno Emerging Markets, 2010). PROFIT was interested in using mobile technologies to facilitate payments to farmers in rural areas to reduce the cost of transactions and decrease the time needed to complete the payments.

C2c. Approach

In 2007, PROFIT identified high transaction costs and a time lag associated with large buyers paying smallholder contract farmers. Around this time, MTZL approached PROFIT with an idea to provide m-payment services, which had the potential to greatly lower the transaction costs of buyers paying farmers.

Supporting market research. PROFIT provided technical assistance and funded market studies to evaluate opportunities for m-money in the cotton and dairy value chains.

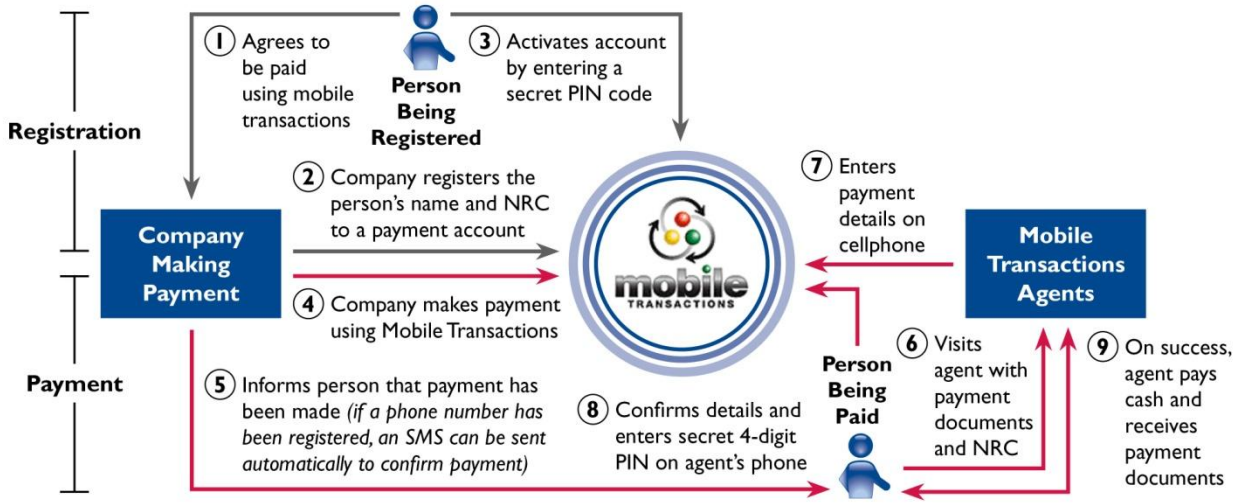
Facilitating private sector linkages. The PROFIT project introduced MTZL to Dunavant Zambia Limited, a large cotton ginning company that finances and buys cotton from smallholder farmers

in largely rural areas. Dunavant's challenge was the time it took to make cash payments to these farmers — often two weeks or more. With the support of USAID, MTZL designed and piloted an m-payments system for Dunavant to pay some of these farmers.

Investing in an m-money platform. PROFIT provided MTZL several tranches of funding totaling about $280,000 over several years to design the m-money system (see Exhibit 3) and pilot the m-payments service. MTZL agreed to share the costs of development.

Targeted technical assistance on regulatory framework. PROFIT provided limited, short-term technical assistance to assess the current regulatory framework for MMT and m-banking in Zambia and to recommend improvements to MTZL's compliance through policies and procedures.

Exhibit 3. MTZL's M-Payments System



Payment System Graphic (Source: MTZL Website)

C2d. Results

MTZL is now offering P2P and B2P services, targeting customers at the base of the pyramid. It also accommodates low-value transfers, with four price tiers for money transfers. The fees are paid for in advance by the sender; the receiver does not pay any fees. The three main products are

1. payment systems targeted at companies making mass payments to the rural unbanked who currently receive cash
2. "1 Account," an m-wallet, with no monthly payments or minimum balance, needing only a mobile phone and SIM card to operate
3. town transfers, in which customers use the MTZL agent network to send and receive funds cheaply, securely, and easily

In February 2010, there were 30,000 transactions using the m-payment platform, and the number of m-money transactions was growing more 40 percent every month. There are more than 100 active agents, many in rural areas, providing cash-in and cash-out services. MTZL has begun to

approach larger retail chains, such as grocery stores, to expand its agent network. Dunavant, MTZL, and PROFIT are continuing to collaborate to support a comprehensive pilot m-payment program in Eastern Province for cotton farmers for the 2010 harvest.

C2e. Key Findings and Lessons Learned

Donor funding supported market research and development of m-money platform. When PROFIT first met MTZL, it was a small start-up firm interested in using mobile technologies to serve rural populations. However, it did not have the resources to fulfill this mission until it started working with USAID and other donors. Donor assistance helped MTZL create the mobile transactions technology platform, conduct the initial market research targeting the unbanked population, and pilot test the technology and user interface with farmers in the rural areas.

Keep the regulators aware to ensure some flexibility. The regulators have provided a "controlled, but nonrestrictive" environment for m-banking to develop. Sharing information on innovations and getting their buy-in on products, services, and KYC procedures have been important (MTZL, 2010). For example, under the current regulatory framework (i.e., the AML directives of 2004), the KYC procedures are flexible and allow for the use of alternative verification methods when identifying a potential bank customer. Today, to open an account, the law requires a national registration card, driver's license, or passport, and proof of name and address. However, there is some flexibility: Once a customer receives his/her identity document, another bank customer, the potential customer's employer, or a village chief can verify his/her identity.

Supporting a third-party provider offers potential for interoperability. MTZL's m-payments service could, potentially, be a tool that all of the banks and MNOs in Zambia can use. In Zambia, the decision to work with a private-sector start-up firm such as MTZL was simple because, at the time, it was the only mobile transactions company that was specifically targeting the low-income population, which was in the interest of the donors. In other countries, if more competition exists in the industry, then donors would have to pay be careful not to distort the market by favoring one actor over another. In other words, there would have to be a competition process for the grant.

C2f. Sustainability and Potential for Replicability

Attracting additional private-sector investment. After the completion of the pilot to deliver m-money payments to Dunavant farmers, the Dunavant Corporation decided to invest in the MTZL business, and now owns a 25-percent stake in the fast-growing company. MTZL also received a convertible loan over five years from the Grassroots Business Fund. These investments should help it to grow and provide MFS in a sustainable way.

Financial literacy and targeting rural clients. Farmers' distrust of electronic money was one of the biggest challenges during the PROFIT-funded pilot. In order to sustainably introduce m-money in Zambia, there needs to be a focus on increasing financial literacy and awareness of the benefits of m-money, particularly in rural areas. A better understanding of the technology will help clients develop trust in the system and make them more comfortable with sending and receiving funds via their mobile phones.

C3. WING Cambodia Supported by IFC

C3a. Background and Environment

In Cambodia, a country of 14.5 million, the number of banked customers is extremely small, at about 5 percent. According to joint research conducted by IFC and ANZ Bank, as of March 2007, the number of mobile phone subscribers had increased substantially, to more than 1.6 million, and about 1 million cell phone users were unbanked. In addition, 80 percent of the population had access to a mobile phone and penetration is growing at 50 percent per year (IFC Financial Literacy Terms of Reference, 2009).

The financial sector in Cambodia has experienced rapid growth over the last few years. The number of commercial banks has significantly increased over the last four years, from 15 in 2004 to 26 today (not counting six other specialized banks). The number of MFIs has also increased considerably. However, the use of financial services and products, including WINGS' newly introduced mobile phone remittance services, remains very limited, at about 8 percent of the total population (IFC Financial Sector Diagnostic, 2008).

WING is a payment platform wholly owned by ANZ Banking Group, which partners with ANZ Royal to hold client deposits. It launched an m-banking, USSD solution with SMS receipting in January 2009 that is capable of working with any MNO. WING currently offers airtime top-ups, bill payments, and money transfers, and has partnered with five telcos in Cambodia. Customers are acquired via commission-based sales agents in the field. Cash-in at merchants (including MFI partners) or via payroll disbursement and Cash-out occurs at merchants or ATMs .

M-money regulations are being developed by the National Bank of Cambodia (NBC), which has been quite open to WING's entry into the country/market.

C3b. Donor Objectives

The IFC's Access to Finance program works with financial institutions and regulators to strengthen the financial sector, and deepen financial intermediation and outreach. Its objective is to increase the private sector's access to finance.

With a view to successfully introduce branchless banking services to unbanked, low-income customers in Cambodia, IFC supported WING in its start-up phase and entered into a cooperation agreement under which it provided technical assistance on a 50-50 cost-sharing basis. IFC's contribution to the total cost was about $120,000 over about nine months (Margarete Biallas, IFC, March 2010).

C3c. Approach

IFC partnered with ANZ in 2007 to conduct research on the market for m-payments and banking for the unbanked. ANZ set up a subsidiary, WING, in March 2008, to acquire and provide a technological platform for m-payment solutions in the country. With advisory services from IFC, WING has developed a customer care center, a merchant network, and a strategy for technology uptake. IFC and WING are also jointly conducting a financial literacy campaign on m-banking

and facilitated a dialogue with NBC to ensure its confidence amid insufficient governing laws and regulations.

Initial market research and business model development. IFC spent significant resources developing the business model before WING was launched. This included specific technical assistance on issues such as change management/strategic marketing for technology uptake, customer management strategy, development of a merchant and agent strategy, and financial literacy concept development.

Facilitating dialogue with regulators. IFC has been facilitating a dialogue with NBC to make sure its is comfortable with the official introduction of the solution. IFC is continuing to work with NBC on an improved regulatory environment.

WING addressed two components to address accessibility: technology and usability (WING Social Report, 2009). A significant design challenge has been the inability to offer the m-banking service in the Khmer language. Khmer Unicode is installed only in a limited number of high-end mobile phones in Cambodia, and the use of USSD and SMS technology is still largely through English. So WING has utilized the Romanized Khmer language for transaction names (see graphic from WING Social Impact Report 2009, to right). For example, a transaction originally called "Send Money WING" is now called "WING Banh Luy," which translates as "Send Money with WING." WING has also produced simple, laminated transaction cards to assist non-English-speaking clients with the most common transactions.

C3d. Results

M-banking services were launched in late January 2009. WING provides cash-in/cash-out, P2P payments with now more than 598 cash express points. Using a 10-digit passcode, users can send money to non-WING customers. After 15 months of operations, WING serves more than 100,000 clients, 56 percent of whom were previously unbanked (Margarete Biallas, IFC, 2010). Of these, 67 percent are women and 20 percent live in households where income is less than $2 per day.WING has also partnered with five telcos and three MFIs. The MFIs serve as outlets for WING express points for cash-in /cash-out and are working on similar arrangements with MFIs in 20 of Cambodia's 24 provinces. WING has 31 Master WING Cash X-Press outlets — 15 in Phnom Penh and 16 in the provinces — and 488 Cash X-Press outlets in every province (WING Social Report 2009).

Money transfer transactions have increased dramatically since WING started. Growth has averaged 85 percent per month for WING-to-WING transactions and WING Wei Luy transactions, which allow clients to send up to $50 to any recipient) The value of transactions

increased from $16,000 in January 2009 to over $550,000 by December 2009. Furthermore, as of December 2009, a total of $2.3 million had been transferred through the WING system.

C3e. Key Findings and Lessons Learned

It is critical to develop business model up front. With assistance from the IFC and ANZ, WING's business model was developed about nine months before product launch. This was crucial for laying out the product marketing strategy and the development of the agent network, which are probably two of the most challenging issues currently facing providers.

Identify large, private-sector partner(s) from the beginning. Identifying ANZ as WING's main private-sector partner was another key to success. Working with a reputable and well-funded financial institution such as ANZ ensures that WING will have the financial and institutional support it needs as it grows.

Continue to dialogue with regulators to keep ahead of any new electronic money regulations. WING has engaged the NBC from the inception of its product. Because electronic money legislation is still being developed, the NBC issued a letter of no objection under which WING operates (Brad Jones, WING, 2010). However, WING expects regulations that cover third-party processing to be passed into legislation in the coming months. It is keeping in close contact with the NBC about this.

Be flexible in developing an agent network. In 2009, Master WING Cash X-Press merchants were launched. They are responsible for some small WING outlets, providing them with document-return services, electronic liquidity when they need to top up, and WING starter kits (WING Social Report 2009). Moving from its initial "flat" agent network with multiple categories to a two-tier model in which master agents are responsible for smaller retail agents has helped improve quality and transaction volume in the agent network, including reinforcing minimum liquidity standards (WING Social Impact Report 2009).

C3f. Sustainability and Potential for Replicability

Is the bank-led model more sustainable? Because WING is wholly owned by ANZ, it has access to financial and human resources that an MNO or third-party provider might not. These resources may help WING to break even and eventually become profitable in just a few years. Additionally, if WING succeeds, ANZ could replicate it in other countries.

Regulatory issues may be a constraint in the medium to long term. WING now provides limited payroll services because, unfortunately, the NBC is restricting it to Khmer Riel accounts. Without approval to transact in U.S. dollars, WING cannot be involved in payroll services for the country's large garment industry, which is dollar-based (M. Biallas, IFC, 2010).

Interoperability and working with MNOs. WING is working with five of the eight telcos operating in Cambodia. WING is not available with Mobitel, the country's mobile leader in terms of market share, or Metfone, which is understood to cover the largest area of any mobile service in the country. It is believed that Mobitel is developing its own MMT network. By

partnering with multiple MNOs, WING should be more sustainable and convenient than other services in the market.

C4. USAID/Philippines' MABS M-Banking Applications

C4a. Background and Environment

The Philippines has a population of about 97,976,603 (CIA World Fact Book). As of December 2009, the country had 785 banks with 8,620 head offices and branches, including 674 rural banks with 2,767 head offices and branches. The banking penetration is around 35 percent, which leaves an estimated 21 million potential clients with mobile subscriptions without bank accounts (Torres, 2010). The mobile penetration rate in the Philippines is one of the highest in the developing world, with more than 76 million subscriptions. This is partially due to relatively higher costs, difficulty getting fixed-lines, and connecting to the Internet (ITU 2009).

Box 15. Philippines at a Glance

- Population: 97,976,603 (July 2009); 65 percent urban
- Labor force: 31 percent agriculture, 15 percent industry, 51 percent services
- Mobile phone penetration: 75 percent in 2008
- Population below poverty line: 32.9 percent (2006 estimate)
- Major MNOs : Smart 55.8 percent, Globe 36.3 percent, Sun Cellular 11.7 percent

(CIA World Fact Book, World Bank

There are currently two MNOs that have been involved in MMT platforms used by banks and others to provide MFS. Smart Money is issued by Banco de Oro and managed in partnership with Smart Communications and GCASH, which is offered by financial service provider GXI, a regulated electronic money issuer owned by Globe Telecom. These two MMT platforms use STK technology. Both MMT platforms provide basic remittance and payment services and both are now being used by banks to provide access to m-banking services.

The Philippines's Central Bank (BSP) has been open to the development of MMT platforms and m-banking services. The regulations have provided flexibility "without sacrificing proper governance, sound banking practices, and regulations under the international anti-money laundering environment" (Torres, 2010). During a regional MMT conference in Manila in 2009, the BSP Deputy Governor stated that proportionate regulation is necessary to avoid stifling innovation and to allow market to grow (Torres, 2010).

C4b. Donor Objectives

The USAID-funded MABS-4 program is a four-year, $9.7-million program designed to accelerate national economic transformation by encouraging the Philippines rural banking industry to expand access to microfinance services, in collaboration with the Rural Bankers Association of the Philippines (RBAP). To do so, the program assists partner rural banks to increase the financial services they provide to microenterprises, small farmers, and low-income households by providing microfinance technical assistance and training (RBAP-MABS, 2010).

In 2004, Globe Telecom, through its electronic money subsidiary GXI, began offering its GCASH MMT services. The RBAP-MABS program recognized that these m-money services could improve the efficiency and reduce the costs of collecting and administering loans for clients at rural banks, which were receiving technical assistance from the program. Through a

2004 survey of several hundred rural banks' microfinance clients, the program found that 67 percent owned mobile phones and a further 25 percent had at least one household member who owned a mobile phone. In 2009, a national survey found that approximately 94 percent of the rural banks' clients either owned a mobile phone or had access to a mobile phone at their households (RBAP-MABS, 2010). With this information, USAID and the RBAP-MABS program initiated a pilot of the m-money service through several banks.

C4c. Approach

In 2004, the RBAP-MABS program approached Globe Telecom to facilitate the use of m-banking services through the rural banks to lower-income clients. GXI, a wholly owned subsidiary of Globe Telecom, partnered with MABS for the initial pilot test of the Text-A-Payment service for repayment of microloans. Building on the success of the pilot, rural banks can now offer mobile phone-based financial services. These services include Text-A-Payment for loan payment; Text-A-Remittance to transfer money locally and abroad; Text-A-Deposit for remote deposit mobilization; Text-A-Withdrawal, with which clients can withdraw electronic money directly from their savings account to their m-wallet; Text-A-Sweldo for payroll services using GCASH; and Text-A-Bill Payment for bill payments at local utility companies.

Engaging the regulators. From the inception of the idea to bring m-money services to the rural bank clients in 2004, RBAP, with the support from its MABS program, has engaged with the BSP to explain the product and potential results, and request its approval of the services. The RBAP-MABS team continues to dialogue and engage regularly with the BSP on issues related to m-banking.

Building the capacity of the rural banks. To increase the knowledge and trust within the rural banks of the new m-banking product, the RBAP-MABS program, with the support of GXI, facilitated numerous workshops on m-banking. The workshops explained exactly how the applications worked, how to implement the products through existing bank systems, and how to roll out to clients. RBAP-MABS also helped to develop the bank policies and procedures related to m-banking transactions, which included training on AML, CFT, risk management, and other relevant issues required by BSP regulations. The banks and their clients are finding that m-banking offers significant benefits, including reduced costs, security and convenience in accessing financial services, and expanding business opportunities.

Leveraging public-private partnerships. Since the initial pilots in 2005 to February 2010, USAID has contributed approximately $701,533, mainly through technical assistance directly to m-banking efforts in the Philippines through the larger MABS program. The technical assistance comprised approximately 3,000 days of level of effort over five years, including the chief of party and deputy chief of party (10 percent of their time), two full-time m-banking specialists, one full-time senior-level information technology specialist, and other long-term staff. It is also important to note that the RBAP-MABS program had been working with rural banks, the BSP, and other private partners to expand banking services to the microenterprise sector for almost seven years before embarking on m-banking services, which was important key to its success. Furthermore, through partnerships with Globe Telecom, rural banks, Nokia, and others, the RBAP-MABS program raised an additional $797,640 in private sector counterpart contributions specifically for m-banking development aimed at the base of the pyramid.

C4d. Results

As of December 2009, there were 122, 959 rural bank clients registered for m-banking services, and 886 rural bank branches offering m-banking services. The cumulative value of m-banking transactions was approximately $108 million. Clients can now access six types of MFS: receiving loans; making payments and deposits; withdrawing funds from deposit accounts; remitting and receiving money from relatives and friends; receiving salaries; and even buying and selling goods using electronic cash. MABS has also assisted in working with the regulators to obtain approval for m-banking services (see Box 16).

Box 16. Roadmap of Regulatory Approvals and Application Development 2005-2009

2005: Text-A-Payment approved by BSP and rolled out through banks.
2006: Text-A-Deposit approved by BSP and rolled out through banks. BSP approves cash-in and cash-out service for rural banks (Text-A-Remittance).
2007: Text-A-Withdrawal, Text-A-Bill Payment and Text-A-Sweldo (salary) approved by BSP, and rolled out through banks.
2008: RBAP-MABS' m-banking specialist program generated 60,000 new users and 3,400 new local merchants. RBAP developed partnerships with Nokia and Smart Communications.
2009: BSP approved Smart Money pilot; 55 accredited rural banks with 830 branches offering m-banking.

- BSP approved activation of a 15,000-agent sub-distributor network to provide cash-in and cash-out services.

For rural banks, m-banking has reduced operating costs, increased transparency of financial transactions, improved fraud control, and reduced errors associated with manual cash transactions. Nationwide, more than 3,000 agents now provide cash-in/cash-out services; due to recent regulatory approval, that is due to rapidly expand to 15,000.

C4e. Key Findings and Lessons Learned

Existing long-standing partnerships. One of the critical success factors for RBAP-MABS' m-banking applications was the effective partnerships the program established with the rural bankers, BSP, and other industry stakeholders when the program began in late 1997. The RBAP-MABS team was able to build on these relationships to launch and develop applications in a relatively short timeframe.

Significant public and private investment. The program was essential in facilitating a partnership between GXI and the rural banks to bring m-banking services to low income clients. Globe's GXI made significant contributions by developing systems they opened up to the program and rural banks at their own expense. Because of its significant subscriber base, Smart Communications is expected to provide a similar level of support and work closely with the rural banks over the coming years.

Expanding and improving the agent network. The commission that agents receive for GCASH transactions is generally 1-2 percent, versus the 13-14 percent small retailers receive for airtime top-ups. Airtime sub-distributors usually earn margins of about 2 percent, so the decision to now focus on them rather than retail airtime retailers will eliminate the disincentive smaller vendors faced. Additionally, BSP issued regulatory approval to work with the 15,000-strong airtime sub-distributor network as agents.

Differences between Kenya and the Philippines. Given the Philippines' deep mobile phone penetration and high literacy rate, the uptake of m-banking services has not been as quick as

Kenya's M-PESA. There are several reasons for this. First, prior to the launch of GCASH, the Philippines had more ATMs, and affordable and reliable money transfer services; prior to M-PESA, there were fewer affordable and reliable domestic money transfer services available in Kenya (see Table 2). Also, some GCASH agents are also agents for other remittance providers (e.g., Western Union, Money Gram, and Uniteller), so there is greater competition for remittance products and services — often in the same shop. Furthermore, Safaricom was able to set up agent networks quickly, with little or no restrictions from regulators; in the Philippines, GCASH and Smart Money were restricted by the agent remittance regulatory requirementsthat made it hard to set up agent networks quickly and efficiently. Last, Globe Telecom and Smart Money have market shares of 33 percent and is 55 percent, respectively; Safaricom's market share in Kenya is more than 80 percent.

Table 2. The M-Banking Environment in the Philippines and Kenya

	Philippines	Kenya
Market share of major m-banking provider	55% Smart, 33% Globe	Safaricom 80%
ATMS in country prior to MMT service	7,155 (as of Dec. 2007)	1,078 (as of Dec. 2007)
Mobile Subscriptions (2008)	75%	42%
Population (2008)	90.35 million	38.53 million
Agent Network in 2009	3,000+	10,000+

Source: Central Bank of Kenya, Central Bank of Philippines, CIA World Fact Book, World Development Indicators

C4f. Sustainability and Potential for Replicability

Recent regulatory approval on expanding agent network. Globe recently received regulatory approval to activate a 15,000 agent sub-distributor network to provide cash-in and cash-out services. In addition, GXI launched a new product, GCASH Remit, that does not require clients to have a Globe subscription and the sender pays the sending fee up front. With the addition of these agents, the combined network will be more than 18,000, which is more than four times larger than any other domestic or international remittance company and 50 percent larger than all other remittance companies combined. This will presumably increase Globe's market presence in the Philippines.

Building a broad m-money ecosystem. RBAP-MABS is advocating a multi-use approach that focuses on a broader m-money ecosystem that includes banking, payment, and trading activities. This approach may enable the program to reach the volume of transactions achieved by M-PESA in Kenya. Multiple stakeholders will have to adopt the approach, and it must go beyond basic MMT. It is believed that a more established m-payment ecosystem will, in the near future, enable more unbanked to gain access to banking services via m-money platforms than in recent years.

Potential for interoperability. After waiting several years, RBAP recently received approval from the BSP to work with Smart Money. RBAP-MABS plans to work with Smart Money to first support domestic MMTs and then expand to m-banking services for rural banks over the long run.

C5. Vodacom's MPESA in Tanzania

C5a. Background and Environment

Tanzania has a population of approximately 42.5 million, 72 percent of which lives in rural areas. There are 28 commercial banks; about 12.4 percent of the population is banked by formal financial institutions (Finscope survey, 2009). Mobile phone subscriptions grew from 9 percent in 2005 to approximately 35 percent in 2009 (World Development Indicators and CIA Factbook).

Box 17. Tanzania at a Glance

- Population: 42.48 million
- Labor force: 69 percent in agricultural sector
- Population below poverty line: 36 percent
- Internet users: 1.3 percent
- Literacy rates: male: 77.5 percent; female: 62.2 percent; total population: 69.4 percent
- Mobile penetration: 35.5 percent
- MNOs: Vodacom 41 percent, Zain 29 percent, and Zantel 8 percent

(ITU Africa 2009 Report, World Development Indicators, CGAP Technology Program)

There are m-money offerings in Tanzania — by Zain, Vodacom, and Zantel, for example — but the leading MMT provider is Vodacom Tanzania, which offers an M-PESA product similar to the one in Kenya. Launched in Tanzania in April 2008, M-PESA is an m-payment solution that allows users to hold money in a virtual "stored value" account maintained in a server by the MNO and operated by users through their mobile phones. Users can deposit or withdraw cash with a local M-PESA agent (Heyer and Mas, 2009). As of October 2009, MPESA had more than a million customers transferring $12.8 million per month at about 2,000 agent locations (CGAP, 2009). Vodacom partnered with Tujijenge Tanzania, a large MFI, in 2009 to provide micro entrepreneurs the opportunity to make loan repayments through local Vodacom agents.

The Bank of Tanzania has provided a supportive enabling environment for m-banking and m-payments , providing standards and guidelines and performing an oversight function to ensure compliance to the standards (Bank of Tanzania, 2009).

C5b. Donor Objectives

The Bill and Melinda Gates Foundation created the Financial Services for the Poor initiative, which seeks new ways to deliver financial services at lower cost and greater convenience to poor households. It does this by working with savings banks and credit unions to double the number of accounts for poor clients through technical assistance, access to technology, and teaming with mobile phone companies, banks and MFIs, and exploring agent banking systems based in post offices and retail outlets to extend financial services into neighborhoods (Gates Foundation, 2010).

This program has provided a $12.4 million grant to the GSMA, which supports the MMU program. The MMU program has launched a $5-million fund that awards innovation grants to support commercially viable and sustainable MNO-led projects in developing counties that contribute to meeting the MMU goal of reaching 20 million previously unbanked people with MFS by 2012. The fund focuses on: 1) supporting commercially viable projects; 2) providing quick responses and straightforward grant processes; 3) ensuring mobile services are targeted at base-of-the-pyramid customers; and 4) knowledge-sharing (GSMA, 2010).

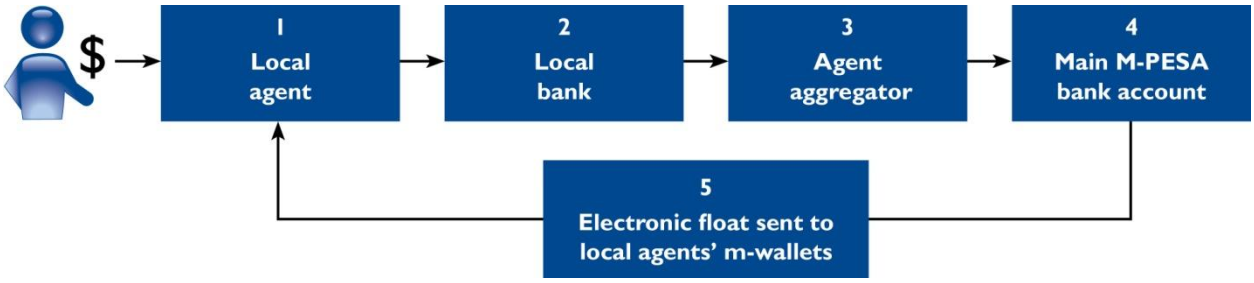
In November 2009, MMU provided a grant of $250,000 to Vodacom Tanzania with the objective of providing a geographically wider line of electronic money (revolving) credit to increase the total electronic float holding value within the M-PESA agent network. (The electronic float is the difference between bank deposits and withdrawals.) This additional investment will improve customer access and usage as entrepreneurs are empowered to invest in the M-PESA business opportunity and grow the agent network (MMU Web site, 2010).

C5c. Approach

Vodacom Tanzania has an established and growing M-PESA customer base with 2,000 active agents, although approximately 4,000 agents were registered as of March 2010. One constraint agents have faced is having disposable cash on hand to cash out transactions for M-PESA customers. The ability to extend cash-in, cash-out, and money transfer services to more clients may lead to an increase in transaction volumes, but agents must be willing to hold a higher electronic float on their phones to be able to provide these services. It is important to ensure that agents have a cash balance large enough to service their customers, but not so much that it becomes a liability for them.

*Supporting aggregator agents and managing liquidity.*Vodacom received GSMA's MMU grant to support M-PESA aggregator agents to overcome liquidity issues faced by lower-tier agents. It can take several days for agents to receive electronic money on their phones, because the electronic money moves from the local bank, through the agent aggregators, to the MPESA bank account before it appears in the agent's m-wallet. (See Exhibit 4 for a diagram of the system.) This grant allows Vodacom to provide credit to aggregators, who can then supply the lower-tier agents with electronic money without requiring advance payment prior to providing the electronic float. Each aggregator agent is responsible for selecting, training, and supervising lower-tier agents, and managing agent liquidity and distributing commissions (Mas and Ng'weno, 2009). The hypothesis is that increasing agent's electronic float will increase client satisfaction and transaction volume, which, in turn, will cover the cost of credit to the agents.

Exhibit 4. Tanzania M-PESA Electronic Float Steps



C5d. Preliminary Results and Lessons Learned

Positive preliminary results. Even though the grant was disbursed in November 2009 — a relatively short time ago — preliminary results show turn-around time for obtaining electronic money has decreased as a result of the credit line, and that aggregators are pleased with the new

model (Coffey International, 2010). A large number of customers registered in the previous quarter, although this is not directly attributable to the introduction of the credit line.
Lesson learned. Supporting agent aggregators and ensuring sufficient electronic money in the system may increase client satisfaction, build confidence in the use of M-PESA, and lead to increased uptake of m-money services.

Expanding the agent network can support outreach to MFI clients. In July 2009, Vodacom started a pilot activity with Tujijenge MFI to test loan repayments through local M-PESA agents for approximately 100 clients. By March 2010, clients reported that several local agents were not holding a large enough electronic float on their mobile phones to be able to accept cash and allow customers to make loan payments using their m-wallets. This was inconvenient for the clients because they sometimes had to visit five to 10 agents before finding one with a large enough electronic float. For some clients, the search for a local agent with sufficient float was causing a delay in making their loan payments. Tujijenge indicated it does not want to roll out this service to the rest of its clients until these float problems are resolved.

Lesson learned. The electronic float issue may be a constraint in expanding the use of M-PESA. If Vodacom is able to solve its agent liquidity issue, it may be able to offer loan payment services to other MFIs in Tanzania. Tujijenge has also expressed interest in using M-PESA for loan disbursements.

Similar location, but different countries. There has been much debate about M-PESA's success in Kenya and the much slower uptake in neighboring Tanzania. Fourteen months after the launch of M-PESA in Kenya, there were 2.7 million users and almost 3,000 agents. After the same amount of time in Tanzania, there were 280,000 users and only 1,000 agents (Camner, Sjoblom, Pulver, 2009). The geographic, demographic and mobile penetration differences between the two countries portray many of the likely reasons for the difference in uptake (see Table 3). For an analysis of M-PESA, refer to the GSMA MMU article: "What makes a Successful Mobile Money Implementation? Learnings from M-PESA in Kenya and Tanzania."

Table 3. Tanzania and Kenya Comparison Chart

	Tanzania	Kenya
GDP per capita	$520	$890
Size ($km^{2)}$	945,090	582,646
Population	41.5 million	38.6 million
Population/km^2	43.9	66.2
Exclusion from financial services	56%	33%
Proportion of domestic money transfers in country prior to M-PESA	13%	17%
Subscriber market share	45% Vodacom	79% Safaricom
Owned mobile phone prior to launch of M-PESA	15% of adult population	27% of adult population

Lesson learned. Even though two countries have similar geographies or share other characteristics, it is important to consider differences in mobile penetration, access to financial services, and numbers of domestic money transfers when developing m-money services.

D. Concluding Remarks

Based on the successful approaches used to implement m-money interventions and the findings of the case analyses, program designers and implementers interested in promoting MFS can draw a number of conclusions. These key considerations for programming should be supplemented with the annex, including the diagnostic checklist and the model scopes of work, and existing resources as described in Section D2.

D1. Key Considerations for Program Design

Below are chief considerations for designing and implementing m-money interventions including best practices regarding USAID's role; suggestions for engaging regulators, MNOs, and financial institutions, and considerations for promoting m-money ecosystem development.

D1a. USAID's Role

- Programs should serve as a facilitator of relationships between/among actors (e.g., MNO and bank regulator) and perhaps also as a "demonstrator" that m-money interventions can work. Once m-banking is successfully piloted and launched, there is a business case for the private sector to remain engaged to ensure sustainability.

Box 18. Tips for Program Designers

- Carefully consider the contract mechanism (e.g., grant, contract) to allow flexibility to achieve objectives.
- Match project objectives with available resources and realistic time line.
- If m-money is part of a broader project or intervention, develop specific indicators/targets for m-money activities.
- Refer to the diagnostic checklist (Annex A) and model scopes of work

- USAID can play a critical role as an "honest broker" in approaching and facilitating dialogue with regulators. In some countries, it may be challenging for a financial institution or MNO to approach the regulator if they don't have an existing working relationship. USAID may be seen as an objective third party, making it easier for them to engage the regulator — which should be done as early as possible.

- Ensure sufficient resources are allocated to market research and business model development up front (i.e., before product launch) to address the viability and sustainability of m-money interventions. Because some of these m-money products and services are new to the market, it is crucial to conduct market studies first to obtain more information on potential demand, market conditions, and client preferences and behavior.

- Program designers should ensure project objectives match available resources (e.g., funding and technical expertise) and the time frame to reach targets. Some of the m-money interventions analyzed were either under-funded or did not have a sufficient time frame to achieve their goals (or both).

- USAID should continue to promote knowledge-sharing of international best practices for m-money interventions, not only for regulators, but for MNOs, agents, and banks. This

can be achieved by supporting participation in international forums such as the "Windsor Global Leadership Seminar on Regulating Branchless Banking" sponsored by CGAP, Alliance for Financial Inclusion, and DFID, and by organizing study tours to see successful initiatives in Kenya and the Philippines. This may lead to possible replication of successful approaches, although to date, trying to replicate successful initiatives has been very challenging, due in part to differing country, market, and regulatory environments.

- Coordination with other donors and stakeholders is always important; it is particularly crucial in a fast-moving sector with high-profile donor involvement such as m-banking.

D1b. Working with MNOs, Financial Institutions, and Regulators

- M-banking interventions lend themselves very well to developing private-sector partnerships, so cost-sharing agreements with MNOs and banks should be pursued to leverage USAID funding.

- Facilitate a dialogue with regulators as early as possible regarding the regulatory environment for m-money.

- Focus on capacity-building, especially for financial institutions and regulators. The sector may be completely new to these organizations, so USAID can help to train and build capacity. MNOs may also need assistance in channel management and expanding their agent networks.

- Consider technology and solutions that allow for eventual interoperability so multiple telcos and banks can participate in the m-money system. The Department of Defense's initiative in Iraq is an excellent example of laying the foundation (by creating a shared technology platform) for a multi-bank/multi-telco system.

D1c. Products and Services

- Consider including financial literacy initiatives and/or marketing support, particularly when introducing new m-money products or targeting a population that is unfamiliar with m-money (e.g., rural and unbanked). USAID can work with stakeholders (e.g., regulators, MNOs, and banks) to help support financial education.

- Promote products and services that will contribute to holistic ecosystem development and increase the use of m-money, such as payroll services and G2P payments. This is one strategy that may contribute to long-term sustainability and scalability of m-money interventions.

D2. Available Tools and Resources

USAID's and other donors' work in the area of m-money has yielded tools and resources that program designers and implementers considering these types of interventions can use. As part of

this FS Series, a diagnostic checklist (see Annex A) can assist programmers in determining whether or not an m-money intervention is appropriate for their development objectives. The diagnostic checklist is accompanied by model scopes of work (see Annex B) that provide sample language on the objectives, key tasks, and activities, and expected deliverables for m-money programs or interventions.

This primer cites the most current literature on m-money. Resources are also available online, at CGAP (**www.cgap.org**), The Gates Foundation (**www.gatesfoundation.org**), and GSMA (**www.gsma.org**). Another good resource is the USAID/MABS m-banking Web site (www.mobilephonebanking.rbap.org).

ANNEX A. GLOSSARY

Branchless banking: The delivery of financial services outside conventional bank branches using information and communications technologies and non-bank retail agents (e.g., over card-based networks or with mobile phones).[5]

Bearer channel: A method by which mobile phone users access data and voice services. It is a digital channel within the Integrated Services Digital Network, which is an international standard for switched, digital dial-up telephone service for voice and data. Examples are USSD and SMS.

Churn: The loss of clients or customers. The mobile network industry has some of the highest average customer churn in the private sector.

Code division multiple access (CDMA): A channel access method used by radio communication technologies. A basic concept in data communication is allowing several transmitters to send information simultaneously over a single communication channel. This allows several users to share a bandwidth of frequencies, a concept called multiplexing. CDMA employs spread-spectrum technology and a special coding scheme (in which each transmitter is assigned a code) to allow more than one users to be multiplexed over the same physical channel.

Core banking system: A financial institution's internal management or "back office" system. It is the software used to manage clients' accounts, a bank's or institution's general finances, and prepare basic or sophisticated financial reports for internal or external use.

Data repository: A data repository stores enough customer information to facilitate the processing of financial transactions. The data repository would also house sufficient information to authenticate the customer in each transaction. Housing transactional and consumer data also facilitates customer care and the reconciliation of certain financial transactions that use the application development environment to fulfill services. For example, selling airtime would require reconciliation between processed transactions and the airtime loaded by the network operator.[6]

Electronic money (m-money): The electronic alternative to cash. It is monetary value stored electronically on receipt of funds and accepted by payees other than the issuer.

Fiber-optic communication: A method of transmitting information by sending light through an optical fiber. The light forms an electromagnetic carrier wave modulated to carry information. Because of its advantages over electrical transmission, optical fiber has largely replaced copper wire communications in core networks in the developed world.

Financial switch: The interface to a bank's core banking system. Instructions collected by the application development environment through the MNO interface using data from the data repository are translated through the financial switch into a transaction format that the bank can use.

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[5] Retrieved from World Bank's CGAP: www.cgap.org/p/site/c/template.rc/1.11.1029/
[6] w ww.mobilemoneyexchange.org/mBanking/MobileBankingPlatformHighLevelArchitecture.aspx

General packet radio service (GPRS): A mobile data service available to users of GSM mobile phones. GPRSs can be used for services such as WAP access, SMS, multimedia messaging services, and Internet communication services(e.g., e-mail and access to the Web). GPRS data transfer is typically charged per megabyte of traffic transferred. On the other hand, data communication via traditional circuit switching is billed per minute of connection time, independent of whether the user is actually using the capacity or is idle.

Global system for mobile communications (GSM): The most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82 percent of the global mobile market uses the standard. (It is used by more than 3 billion people in more than 212 countries and territories.) Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital.

Interoperability: The ability of a computer system to run applications from different vendors and to interact with other computers across local or wide-area networks, regardless of their physical architecture and operating systems. Interoperability is made possible by hardware and software components that conform to open standards, such as those used for the Internet.

Mobile financial services (MFS): A range of financial services offered by mobile phone. M-payments and m-banking are forms of MFS.

Mobile money transfer (MMT): A subset of m-payment. Customers use their mobile devices to send and receive monetary value (i.e., to transfer money electronically from one person to another using a mobile phone). Domestic transfers and international (i.e., cross-border) remittances are money transfer services.

Mobile payments (m-payments): MMT and person-to-business payments that are made with a mobile phone. Mobile proximity payments involve a mobile phone being used to make payments at a POS terminal. In these cases, the mobile phone may communicate with the POS through wireless technologies, such as Near Field Communication.

Mobile banking (m-banking): The connection between a mobile phone and a personal or business bank account. Mobile banking allows customers to use their mobile phones as another channel for banking services, such as deposits, withdrawals, account transfers, bill payments, and balance inquiries. Most mobile banking applications are additive — they provide a new delivery channel to bank customers. Transformative models integrate unbanked populations into the formal financial sector.

Mobile wallet (m-wallet): An electronic wallet that is accessed only or mainly with a mobile phone. GSMA provides the following more specific definition: M-wallet "is a data repository that houses consumer data sufficient to facilitate a financial transaction from a mobile handset, and the applicable intelligence to translate an instruction from a consumer through a mobile handset/bearer/application into a message that a financial institution can use to debit or credit bank accounts or payment instruments."

Non-bank agents: Retail, lottery, and postal outlets that work on behalf of a financial institution and let clients deposit, withdraw, and transfer funds, pay their bills or an insurance plan, submit balance inquiries, or receive government benefits or a direct deposit from their employer. Transactions are processed with a mobile phone, POS card readers, barcode scanners, and sometimes personal computers that connect with the bank's server via a dial-up or other data connection. A clerk at the outlet — not a bank teller — collects and disburses cash. In some cases, depending on local regulation , a clerk can open bank accounts for new clients and fill in credit applications.[7]

Open systems interconnection (OSI) basic reference model (OSI model): An abstract description for layered communications and computer network protocol design. It was developed as part of the OSI initiative. In its most basic form, it divides network architecture into seven layers. (A layer is a collection of conceptually similar functions that provides services to the layer above it and receives service from the layer below it.) From top to bottom, the layers are the application; presentation; session; transport; network; data-link; and physical layers). Therefore, the OSI model is often called the OSI Seven-Layer Model.

Personal digital assistant (PDA): A handheld computer also known as a small or palmtop computer. Some PDAs have audio capabilities, enabling them to be used as mobile phones, (smart phones), Web browsers, or portable media players. PDAs can access the Internet, intranets, or extranets via Wi-Fi, or wireless wide-area networks. Many PDAs use touch-screen technology.

Point-of-sale (POS) device: An electronic retail payment device (e.g., a mobile phone or other handheld device) that reads a customer's bank name and account number when a bank or credit card is swiped or a number is entered. It contacts the bank and, if funds are available in the customer's account, facilitates the transfer of the customer-approved amount to the seller's account. It can also print a receipt.

Subscriber identity module (SIM): Part of a removable smart card integrated circuit card, or SIM card, for mobile telephony devices, including mobile phones and computers. SIM cards securely store the service-subscriber key used to identify a subscriber. Users can change phones by simply removing the SIM card from one mobile phone and inserting it into another mobile phone or broadband telephony device.

SIM application toolkit (STK): A standard of the GSM system that enables the SIM to initiate actions that can be used for value-added services. STK comprises a set of commands programmed into the SIM card that define how the SIM should interact directly with the outside world and initiates commands independently of the handset and the network. This enables the SIM to build up an interactive exchange between a network application and the user, and access or control access to the network. The SIM also gives commands to the handset, such as a display menu, and asks for user input. STK has been used by many mobile operators worldwide for many applications, often where a menu-based approach is required, such as m-banking.

SMS: A communication service component of GSM that standardized communications protocols to allow the exchange of short text messages between mobile phone devices. SMS text

[7] Retrieved from World Bank's CGAP: www.cgap.org/p/site/c/template.rc/1.11.1029/

messaging is the most widely used data application in the world; it is commonly used as a synonym for all types of short text messaging and the user activity itself.

Third generation (3G): The third generation of mobile phone standards and technology, superseding 2G, and preceding 4G. It is based on the International Telecommunication Union family of standards under the International Mobile Telecommunications program, IMT-2000. 3G technologies enable network operators to offer a wider range of more advanced services while achieving greater network capacity through improved spectral efficiency. Services include wide-area wireless voice telephony, video calls, and broadband wireless data, all in a mobile environment.

Voice-over-Internet protocol (VoIP, IPA): A protocol optimized for the transmission of voice through the Internet or other packet-switched networks. VoIP is often used abstractly to refer to the actual transmission of voice, rather than the protocol implementing it. This latter concept is also called IP telephony, Internet telephony, voice over broadband, broadband telephony, and broadband phone.

USSD: A standard for transmitting information over GSM signaling channels. It is generally associated with real-time or instant messaging-type phone services. It is mostly used as a method to query the available balance and other similar information in pre-paid GSM services. The function triggered when sending USSD is network-dependent and depends on the specific services the operator is offering.

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