



The Case for Bank-Led Mobile Adoption Strategies in Haiti

And the Importance of Interoperability

A Financial Institution's Guide to Understanding Mobile Money Adoption Strategies and
Interoperability Cost Assessments

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Acronyms

ACME	<i>Association pour la Cooperation avec la Micro Entreprise</i>
ANACAPH	<i>Association Nationale des Caisses Populaires Haitiennes</i>
ATM	automated teller machine
BRH	Banque de la République d’Haïti
FATF	Financial Action Task Force on Money Laundering
GSMA	<i>Groupe Speciale Mobile Association</i>
HMMI	Haiti Mobile Money Initiative
ICT	information and communications technology
IT	information technology
MFI	microfinance institution
MNO	mobile network operator
p2p	person-to-person
WOCCU	World Council of Credit Unions

Report Methodology and Purpose

As part of the Haiti Mobile Money Initiative (HMMI) project, World Council of Credit Unions (WOCCU) desired further research into how to develop mobile financial service solutions from the supply side perspective. WOCCU contracted Blaze & Ballast to prepare this independent report analyzing the investment viability for Haitian financial institutions to consider integrating their core banking software with a mobile money platform for the purpose of offering branchless banking services. A second objective was to create a business-planning tool (included as Annex A “Interoperability Cost-Analysis Tool User Guide” and Annex B “Interoperability Cost Analysis Tool”) that would allow financial institutions to conduct a cost-analysis for integrating their systems with a mobile money platform under a variety of potential technical integration methods. The report and the tool are first attempts at quantifying what it would take to achieve systems interoperability between the financial sector and mobile money providers from a business and technical perspective.

It is important to note that the report, with few exceptions, does not address the specific business context under which a particular Haitian financial institution would achieve interoperability. Nevertheless, this would significantly impact the probability of success. For example, a non-exhaustive list of crucial factors not considered in this report would include:

- a) the mobile money providers’ interest and technical capacity to achieve interoperability,
- b) the agent network’s liquidity capacity and geographic proximity to the service area to provide mobile banking services, and
- c) the specific data communication and technology infrastructure available to each financial institution and/or the service area.

All of these factors are important to take into consideration when examining interoperability.

With that in mind, the report and tool were built using the following approach:

1. Research the key event that drove mobile money development: the 2010 HMMI grant and competition.
2. Research the technology related to achieving interoperability and relevant to the Haitian context; specifically, core banking solutions, card processors, and transactional payment switching.
3. Outline the core technical requirements and costs associated with these models as it could apply to Haiti.
4. Establish a baseline investment comparison within the cost analysis tool: outline the cost of building a bank branch outside of Port au Prince.
5. Interview multiple banks, credit unions, and microfinance institutions (MFIs) by phone and in person to determine current perceptions of mobile money, thoughts on information and communications technology (ICT) support and integrations, and gather actual costs and project plans for opening new branches outside of Port au Prince.
6. Aggregate the data to establish national averages across financial institutions to build a flexible tool to be adaptable to any financial institution large or small.
7. Build cost analysis comparisons for mobile services and determine return on investment across all solutions.

8. Present draft of the model to several financial institutions to gather feedback on accuracy of cost, convenience of the tool, and interest in interoperability based on the theoretical solutions proposed.
9. Incorporate findings into a final paper targeted at financial institutions outlining how to provide branchless mobile banking services (primarily savings and loans) through mobile accounts via Haiti's mobile money network.

Executive Summary

The Haiti Mobile Money Initiative (HMMI), a partnership of the Bill & Melinda Gates Foundation and the United States Agency for International Development (USAID), began in June 2010 and was designed to spur the launch of mobile money services in Haiti following the 2010 earthquake. Managed by the USAID-funded Haiti Integrated Finance for Value Chains and Enterprises (HIFIVE) program,¹ HMMI launched a competition to provide incentives to organizations that developed mobile money services and provided grants to address obstacles in the implementation of payment systems and improve access to financial services through mobile money.

Based largely on the success of Kenya's M-PESA product, the HMMI competition was designed to encourage mobile network operators to quickly roll out mobile-based financial services via their existing air-time resellers. The objective was to create a broad base of users and a strong agent network that would eventually provide the "rails" upon which financial services could be delivered to the poor. Five years later, the Haitian mobile money system remains under-utilized; the once-bright hopes for a Haitian version of M-PESA have dimmed while globally air-time top-up, person-to-person (p2p) transfers, and payment services continue to dominate the volume and value of mobile money transactions.

The purpose of this report is to bring a fresh perspective to the original challenge: improving access to financial services for the Haitian poor via mobile money. Instead of assuming mobile network operator (MNO)-led payment use-cases would spur mobile adoption, this report focuses on what the Haitian mobile money system might look like if new income derived from the delivery of mobile banking services could justify the high build-out costs associated with mobile money expansion.

Based on interviews across the Haitian mobile money industry as well as a cost-analysis of the relevant technical requirements and some market conditions, this report finds that a bank-led mobile strategy is a plausible, even probable, method to spur greater acceptance, adoption, and usage of mobile money in Haiti. Further adoption would benefit both the financial sector as well as the mobile money providers.

From the provider perspective, greater participation by financial institutions would: a) add much-needed branch coverage and liquidity to the agent network, and b) improve the mobile money value-proposition to customers. From the financial sector perspective, the delivery of

¹ HIFIVE is a USAID-funded program implemented by FHI 360 and World Council of Credit Unions that expands financial inclusion through improved access to financial products and encourages the use of technology to expand outreach.

remote-based saving and loan products through mobile money networks would allow financial institutions to expand access in areas that today remain without banking services due to the high costs associated with building new brick and mortar branches.

While interviews with actors in the Haitian mobile money industry reveal that financial institutions conceptually understand the opportunity offered by mobile money, it is also clear that previous attempts at greater service integration have failed due to the lack of local technical resources and know-how. Greater technical capability will be necessary to improve planning and execution of the system and for business process integrations or “interoperability” between the provider and financial institution.

Because of the high reliability and security requirements associated with processing electronic financial transactions, this report assumes that “interoperability” is a necessary pre-condition to effectively scaling mobile banking use in Haiti. Consequently, this report incorporates the cost of achieving interoperability under several different technical models and concludes from the Interoperability Cost-Analysis Tool (Annex A and B) that: a) interoperability is a viable investment for financial institutions to consider, and b) the preferred method to achieve interoperability would be through the establishment of a national payment switch.²

A national payment switch would help distribute the high start-up costs among multiple actors while also encouraging knowledge-sharing and the further development of local technical resources to support greater utilization of mobile money in Haiti. Furthermore, if the public sector was involved, the expansion of a national payment switch could allow for greater public-private dialogue over how to effectively improve mobile money oversight and regulation while also encouraging strategic cooperation across the industry to serve not only the financial institutions but the merchant and enterprise businesses throughout Haiti.³

I. Background: Exporting the Mobile Money Concept from Kenya to Haiti

In 2007, in what has now become an oft-repeated story, the Kenyan company Safaricom, with assistance from key investor and mobile network operator Vodafone, re-launched a struggling product called M-PESA that allowed Kenyan customers to transfer money to family members anywhere in Kenya through their phone. The product was easy to use, distributed through Vodafone’s air-time resellers, did not require a bank account, and scaled quickly. Within 8 months more than 1.1 million Kenyans had registered and US\$87 million had been transferred through the system.⁴

As a product, M-PESA was originally designed to enable microfinance borrowers to receive and pay loans. After struggling to gain traction, however, Safaricom switched the strategic focus to take advantage of the large number of (mostly male) workers in Nairobi who frequently sent

² Several interviewees mentioned that the Central Bank of Haiti (BRH) currently possesses a payment switch. It is beyond the scope of this report to endorse a specific switch or to make a recommendation on who should manage it.

³ Public-sector involvement is important to ensure an adequate regulatory framework exists which level-sets industry standards on data and network security in order to instill public confidence in digital money as a safe and viable alternative to cash.

⁴ Isaac Mbiti and David N. Weil, “Mobile Banking: The Impact of M-Pesa in Kenya,” National Bureau of Economic Research May 2011: 1, <http://www.nber.org/chapters/c13367.pdf>.

money home to rural Kenya through inefficient, expensive, and unreliable alternatives. It was after this strategic shift that M-PESA experienced its meteoric rise.

Because of M-PESA's rapid service adoption, many in the international development community wanted to export the model to other countries to address a significant global challenge: lack of access to financial services for the poor. The development community hoped a new model could be gleaned from M-PESA and applied to other countries. Payments (not savings or loans) delivered first through mobile phones not financial institutions would eventually expand access to financial services by making it profitable to serve the poor:

In short, M-PESA provides compelling evidence that efficient payments can provide the building blocks of financial services – deposits, loans, and insurance contracts are no more than an agreed sequence of payments over time. This is prompting a rethink on the optimal sequencing of financial inclusion strategies. Where most financial inclusion models have employed “credit-led” or “savings-led” approaches, mobile money proposes a third approach – focus first on building the payment “rails” on which a broader set of financial services can ride.⁵

Today, eight years after the start of M-PESA, mobile money transactions globally still consist almost exclusively of p2p transfers, air-time top-up and, to a lesser degree, payments while the markets for mobile savings, credit and insurance remain nascent.⁶ Possibly in recognition of these facts, “mobile money” has now been replaced by a focus on “digital finance” which encompasses a broader range of actors, business models, and use-cases offered through mobile systems to support increased financial inclusion.

In 2010, building on the M-PESA model, shortly after a devastating earthquake, HMMI launched a transaction-based award competition to foment private sector adoption of mobile money.⁷ Award qualification was based on the number of “qualified transactions” occurring at “qualified agents.” To encourage scaling of these services outside of existing points of service, the competition rules excluded high-volume remittance locations (most of which were bank branches) as well as financial institution branches themselves from counting as “qualified agents.” Two telecoms, Digicel and Voila, led the charge and would later go on to win the HMMI awards. The competition aside, however, mobile money still had to comply with Haitian law and the Central Bank believed mobile money should be “bank-led,” or, to be more precise, “bank-sponsored.”

While the Central Bank perspective put it at odds with the competition's goal of an MNO-led model, it was hardly unfounded. Haiti is a country with serious money-laundering, fraud, and counterfeiting problems as evidenced by its abysmally-low Financial Action Task Force on

⁵ Ignacio Mas and Dan Radcliffe, “Scaling Mobile Money,” September 2010, <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2010/02/Scaling-mobile-money.pdf>

⁶ GSMA, “2014: State of the Industry: Mobile Financial Services for the Unbanked,” http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/03/SOTIR_2014.pdf

⁷ Bill & Melinda Gates Foundation, “Haiti Mobile Money: A Point-In-Time Case Study,” <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/05/Haiti-Mobile-Money.pdf>

Money Laundering (FATF) ratings, the global standard-setting body for Combating Money Laundering and the Financing of Terrorism & Proliferation.⁸

As the HMMI competition's momentum grew, the Central Bank became concerned over the operators' decision to allow individuals to possess mobile money accounts and make limited low-value transfers (e.g. the "mini wallet") without identifying themselves. From the Central Bank's perspective, allowing the creation of anonymous accounts operating under a new technological and business paradigm could have further weakened the already-fragile market conditions. On September 17, 2010, the Central Bank issued *Circulaire 99* which mandated that any mobile money service operate under a regulated financial institution's banking license.⁹

The resulting compromise between the HMMI competition operators and the authorities meant that operators still controlled the service offering and network but had to operate under the supervision of a regulated financial institution. During the HMMI competition Digicel partnered with the Bank of Nova Scotia to form Digicel TchoTcho while Voila partnered with Unibank to form T-cash. When Digicel subsequently acquired Voila in the spring of 2012, the T-cash mobile wallet was terminated, and TchoTcho Mobile remained as Haiti's only mobile money service until 2013. In that year, Boom Financial launched its mobile banking service in partnership with the Le Levier Federation, a credit union network, and Haiti Pay, launched its LajanCash service in partnership with Banque Nacional de Credit (BNC). This bank-sponsored but provider-run market paradigm persists today.

II. Current Market Perceptions of Mobile Money

Currently all three of Haiti's mobile money products (Boom, LajanCash and TchoTcho) remain "bank-led" from a compliance perspective while functionally operating as non-integrated transfer and payment solutions managed by the financial institution. While a bank-led approach to mobile money remains unproven, there is strong evidence to suggest that Haiti would benefit from such a strategy.

From the provider perspective, greater participation by financial institution could:

- Add much-needed liquidity and branch coverage to existing agent networks, and
- Enhance mobile money's value proposition by offering integrated financial products or service (such as savings or loan products) issued by a financial institution.

From the financial sector perspective, the vast potential offered by mobile money is best demonstrated in terms of geography. Close to half of Haiti's population lives in rural areas. However, of the 175 bank branches nationwide, 67% of all branches and 75% of all automated teller machines (ATMs) are located in Port-au-Prince, with the remaining bank branches located in Haiti's larger second and third tier urban cities. Additionally, while banks hold 90% of total system assets, they typically serve only the formal sector, making them a less viable solution for the many informal merchants and underserved rural communities. In contrast, there are nearly 400 credit

⁸ Financial Action Task Force on Money Laundering, "Follow-up Reports to the Mutual Evaluation of Haiti," <http://www.fatf-gafi.org/countries/d-i/haiti/>

⁹ Lignes Directrices relatives à la Banque à Distance, September 17, 2010

unions and MFIs combined which hold 10% of total assets. Approximately 20% are located in Port-au-Prince while the remaining 80% cover the rural areas of Haiti where close to half of the population lives.¹⁰ Mobile money has the potential to dramatically change financial service access for the rural population and those working in the informal sector.

In recognition of these opportunities, several financial institutions have already attempted greater service integration with the MNOs but have found limited success due to technical and financial roadblocks. The following describes the financial sector's perception and history with mobile money in Haiti. Under Haitian law, regulated financial institutions may offer mobile banking services directly to their clients while unregulated financial institutions may do so only in partnership with a regulated institution. Consequently, market perceptions differed for each group.

A. Perception of Regulated Financial Institutions

Regulated financial institutions see the potential value of mobile money but are waiting for an expanded solution that is: a) better for their clients, b) allows them to efficiently acquire more clients, or c) minimizes reliance on branches, which are typically congested with long lines of people waiting for services.

Two banks interviewed, for example, saw mobile money as a means to reduce both the number of clients visiting their branches and their needs for high cash liquidity at said branches to serve those customers. They see an extensive merchant network as key so that once funds are in a mobile account customers have the ability to use those funds electronically. In addition, they see a benefit to savings and loans, but the large banks will not see mobile money as a core solution for financial services until the Central Bank changes regulations to allow them to recognize electronic signatures and electronic payments as valid authorization mechanisms, both long-standing issues.

Today, regulated financial institutions are frequently constrained from expanding services to rural areas where projected income cannot justify the high cost of brick and mortar expansion. Several executives estimated the cost of opening a new branch to be in excess of \$500,000 per branch with a return on investment typically requiring 4-5 years. On a related point, many noted the high cost of cash management at these locations, with an armored car pick-up costing \$1,500 per trip. If mobile money solutions were to facilitate expanded access to financial services and/or improve operational efficiencies associated with offering savings and loans, the lifeblood of financial institutions, Haitian banking executives maintain they would look more closely at mobile options.

B. Perception of Unregulated Financial Institutions

Unregulated financial institutions such as microfinance institutions (MFIs) face a different challenge. While every MFI interviewed immediately understood the value of mobile money, because they are not prudentially-regulated, they are not authorized to sponsor a mobile money solution themselves. Consequently, the assumption for the present is that MFIs would need to

¹⁰ Banque de la République d'Haïti, "Projet de Stratégie Nationale d'Inclusion Financière," October 2014.

partner with a regulated financial institution and the mobile money provider to enable their clients to receive loan dispersals or make loan payments using their mobile phones.

Like regulated financial institutions, MFIs saw the need for a stronger merchant acceptance network but were also eager to partner with regulated financial institution so they could take their business to a mostly branchless model in rural in Haiti, using mobiles to facilitate access to loan disbursement and manage repayments. Today many rural MFI customers must visit a bank and wait in line every month to make the payments on their loans. The customer has the risk of carrying cash to a branch, the inconvenience of losing valuable time away from their business while commuting to and from the bank, the cost of transportation to the branch, and the loss of time as they wait in line, etc. The ideal mobile solution for MFIs would allow consumers to use the agent network to perform many of these loans operations instead of depending upon the limited number of bank branches throughout the country.

C. Shared Perceptions

A common theme echoed by both unregulated and regulated financial institutions was that they did not have a strong incentive to invest in mobile money both because the commissions they received as cash-in/out agents was not competitive and the service wasn't any better than other available alternatives.

Today, for example, some financial institutions do offer cash-in/out services on behalf of a mobile money operator; however the commissions they earn are significantly lower than what they receive offering similar cash remittance products. This creates a chicken-egg scenario where a limited agent network prevents the provider from increasing its product's value-proposition to compete with the existing alternatives, such as cash-to-cash remittances, but the financial institutions, which could strengthen the network, face no incentive to participate because the service is neither better for their clients nor do they receive equal or greater commissions for participation. Consequently, financial institutions struggle to justify the upfront investment in mobile if the resulting product is not an improvement upon the existing business models or processes. The current options do not present a convincing case for a long term strategic approach focusing on mobile transactions.

Despite the previous challenges, the Haitian financial institutions interviewed did see the business potential of offering mobile banking as a viable investment alternative. Several, in fact, made previous attempts to offer such products but which ultimately failed for technical reasons discussed below. Notably, however, none attempted to directly integrate their core banking system with the mobile money provider's platform. Achieving this type of systems integration or "interoperability" is crucial to offering mobile banking services.

III. Understanding the Importance of Interoperability

"Interoperability" is a generic term referring to the ability of different information technology (IT) systems to communicate, exchange data, and use the information exchanged. The *Groupe Speciale Mobile Association* (GSMA), the global alliance for standardization within the industry,

for example, used the term interoperability to refer to a systems integration between mobile network operators in order to share mobile money customers and agent networks.¹¹

Here “interoperability” means the ability for banking software to communicate with the mobile money provider’s software for the purpose of conducting financial transactions (such as loan disbursements and loan repayments, as well as deposits and withdrawals from savings accounts). In this scenario, a customer is able to access their bank account through their mobile device as well as receive cash-in/out services at mobile money agents. Additionally, from a practical standpoint, achieving this type of interoperability is also necessarily a business decision—financial institutions must have a reasonable profit expectation to justify the high upfront costs associated with achieving interoperability, an issue addressed later on in the report in the Interoperability Cost-Analysis Tool.

Interoperability is crucial to scaling mobile money and offering mobile banking services because it enables better visibility for the financial institutions over the programs they are managing, reduces the manual workload and risk of human error relating to settlement and, most importantly, allows customers to access their accounts through mobile money agent networks without the need to visit a branch.¹²

A. Interoperability’s Technical Requirements

To date, no Haitian financial institution has achieved interoperability largely because of the technical deficiencies within the local IT sector. From a high-level technical perspective, achieving interoperability between a financial institution and a mobile money provider must satisfy the following minimum criteria:

- **Core interface:** The financial institution and the mobile money provider’s software each must provide an interface to allow data communication between the respective databases where client accounts are located (e.g. the “core” of their software) and the outside world. These interfaces are frequently offered by the software provider as an optional service module available for purchase when the system is installed and generally can also be custom-developed later.
- **Integration:** The software maintained by the bank and provider must be able to transmit data between each other in order to conduct financial transactions between the two systems. There are several variations of how to accomplish this integration.
- **Infrastructure:** Because “interoperability” in this context refers to individual financial transactions performed by customers between two separate software systems, high security and system reliability are paramount concerns. Reaching these standards is costly to achieve and maintain. At a minimum, the bank and provider must ensure end-to-end: data encryption, physical and virtual security, and a reliable data connection. This infrastructure must generally exist at and between each branch and bank data center (if one exists) as well as at the mobile money provider’s data center.

¹¹ Dick Clark and Gunnar Camner, “A2A Interoperability: Making Mobile Money Schemes Interoperate,” February 2014, <https://gsmaintelligence.com/research/?file=f2c9c41e3855abad581b93813e15094b&download>

¹² For more information on the benefits of interoperability visit: <https://gsmaintelligence.com/research/?file=f2c9c41e3855abad581b93813e15094b&download>

Software developers with adequate skill and technical expertise to build a core interface or undertake an integration generally are not available in Haiti. To this point, of the financial institutions interviewed for this report:

- Four procured their core banking software license and support via parent companies located outside of Haiti.
- Two procured their core banking software license via a local sales representative but support was offered by remote teams outside of Haiti; and
- One institution's executive was unsure of whether a local sales representative was available or how his software was procured.

The problem is not limited to the financial sector. The mobile money providers face the same challenge. On the provider side:

- Digicel's mobile money system is designed and supported by the Singapore-based company Utiba, with support in the U.S.
- LajanCash's mobile money system is designed and supported by the French-based company Taggitude and supported locally by HaitiPay.
- Boom Financial's mobile money system is designed and supported internally, with technical support in the United States and Haiti.

The limited local technical capacity means that providers and financial institutions must pay exorbitantly high custom software development costs to build interfaces and/or to integrate with other systems. This is due to both the lack of local competition as well as the lack of know-how to manage such projects. In addition, in the global market today, there are few software vendors that offer services in French, limiting the options for the Haitian market. For those that do, getting timely and quality technical assistance in French can still be a challenge.

Software development, however, is only part of the interoperability puzzle. The financial institution's banking software must also be integrated with the mobile money provider's software using secure and reliable infrastructure.

B. Lack of Payments Sector Know-How and Infrastructure

Because of the high security and reliability requirements expected of payment systems, an entire software industry spun off from the financial sector in developed markets to meet payment industry needs. Generally referred to as "processors," these companies first connected financial institutions to card networks in the United States and Europe, for example, but have now branched out to connect financial institutions to a variety of electronic payment networks.

Similarly, banks in some less developed markets formed national payment switching companies to route card transactions between bank accounts, ATMs, and point of sale (POS) devices. These national payment companies are frequently managed like public utilities where profits are reinvested to reduce costs and/or expand access to all investors (which generally include all of the major national banks).

Currently, Haiti has neither a private sector processor nor a national utility type payment switch. While the Central Bank does provide funds-clearing or settlement services (e.g. the actual

transfer of funds) all transactional switching (e.g. real-time electronic funds authorization) used by the financial sector and most of the associated infrastructure is managed remotely by foreign companies generally based in the U.S. To this point, even Haiti's two largest banks (Unibank and Sogebank) rely on international processors to support their card products.

C. Impact on Mobile Money

The technical challenges associated with interoperability require financial institutions to become informed consumers, researching the feasibility of each integration with a mobile money provider before they are undertaken. However, due to the limited technical knowledge within the Haiti financial sector, thorough and complete research has not been completed thus causing many financial institutions to have negative experiences with mobile money.

- One financial institution exploring interoperability with a provider discovered that its core banking software vendor would not build a custom interface to enable mobile transactions because the software version it held a license for was built on top of the Windows XP operating system which was no longer supported by either the vendor or Microsoft.
- Another financial institution stopped a failed loan payment pilot with a mobile money provider after facing operational difficulties attributable to the products not being fully integrated with its system. The piloted product created an unsustainable manual work load and non-transparent customer experience.
- Another financial institution remains unsatisfied because their mobile platform required staff to conduct transactions in two separate applications, creating a heavy workload for their personnel.
- A final financial institution prefers to keep its core banking software separate from mobile money systems but has no plans to develop additional mobile products given the current state of the industry.
- Several financial institutions reported they had initially considered integrating their core banking system with a mobile money provider but found it to be cost-prohibitive due, in part, to the fact that the provider in question was expecting to pass on its software development costs to the financial institution.

Faced with these challenges, it is difficult to imagine Haitian financial institutions achieving interoperability. Fortunately, there are a number of technical integration solutions which could be introduced in Haiti that would both reduce cost as well as improve outcomes. These models are outlined below from a technical perspective and analyzed in the Interoperability Cost-Analysis Tool template from a financial perspective.

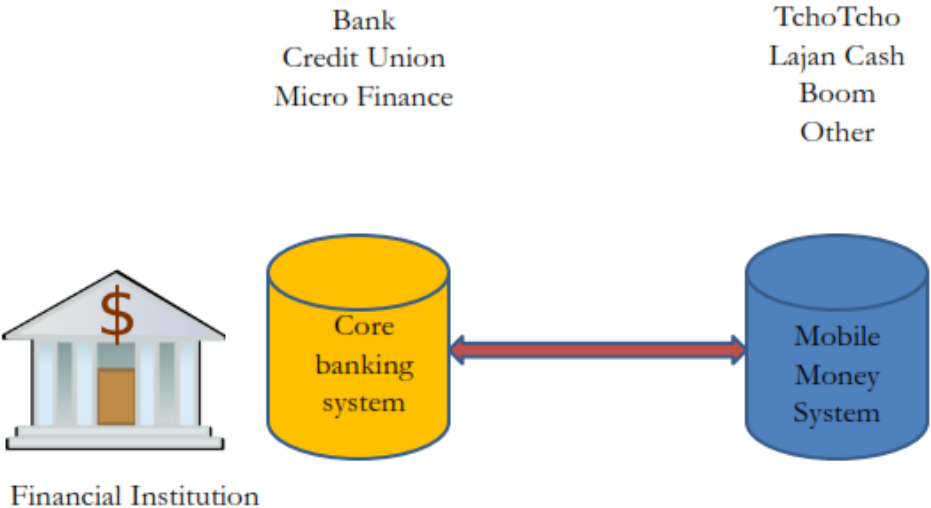
IV. Technical Models to Achieve Interoperability

All models presented below represent technical options for connecting core banking software to the mobile money operator software platforms either directly or indirectly. Each model has a diagram to help visualize the connection points between systems. For the purpose of this report, the goal was to present models that would allow financial institutions to start offering mobile enabled/accessible savings and loan products delivered through Haiti's mobile money networks.

A. One to One Model

In the One to One Model, a single financial institution connects directly with a mobile money provider.

One to One



The One-to-One Model is included as a baseline comparison and represents the paradigm under which most Haitian financial institutions have previously analyzed interoperability with mobile money providers. In the one-to-one model, the financial institution directly connects to the mobile money provider. In this type of relationship, the financial institution would likely contract with a software firm to build a custom interface between its banking software and the provider’s software but would otherwise manage all other start-up and operational responsibilities.

This model implies very high start-up costs as well as very high operational costs due to the need to maintain specialized staff that can manage all product aspects as well as the inability to distribute costs among other actors. Only very large banks utilize this model to offer credit cards due to the high level of technical and operational responsibility; a single direct integration with one of the major card networks costs well over \$1 million in start-up costs. This model is likely not plausible in Haiti but is included as a reference point for financial institutions.

Advantages:

- Short time to market because the business model is simpler; one client one cost model.
- Interfaces with legacy core banking system.
- In mature markets, may be less expensive due to removing payment intermediary.

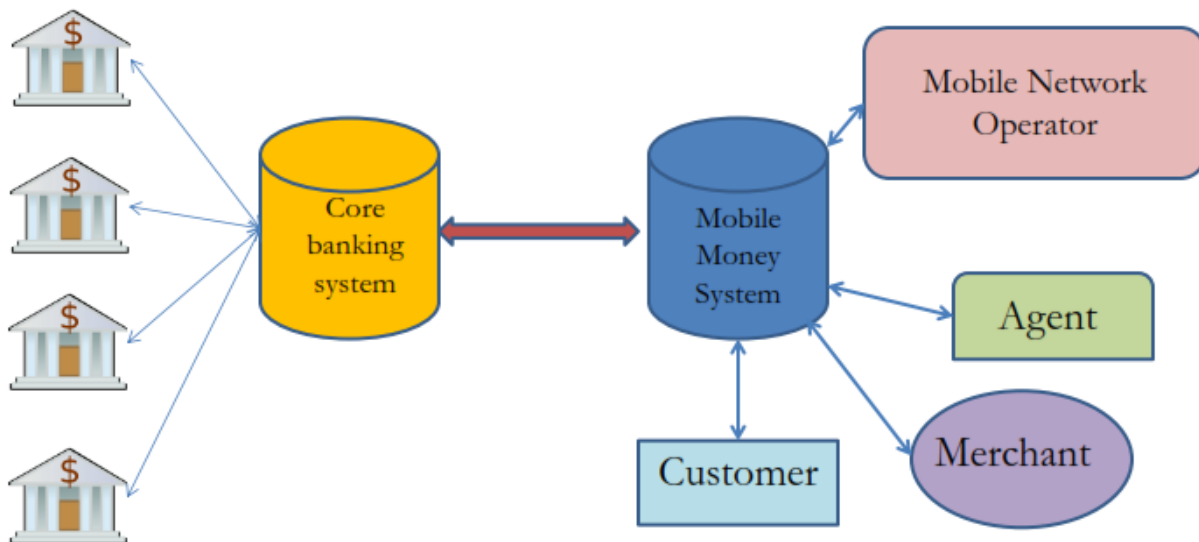
Disadvantages:

- Very high start-up costs due to the inability to share or distribute costs among multiple actors:
 - High operational costs. Process changes can only be used by one institution.
 - High custom software development costs. One-off software integration to core banking system cannot be reused to integrate with other payment systems or by other financial institutions.
 - High infrastructure costs. Costs cannot be distributed among multiple actors despite likely excess capacity.
- Very high cost to maintain due to the inability to share or distribute costs among multiple actors.
- Requires specialized staff not usually available at financial institutions.

B. Shared One to One Model

In a Shared One to One Model, many financial institutions that share the same core banking software form a network to connect with a mobile money provider. Many costs, such as integration, regulatory compliance, and training can be shared amongst the network of financial institutions.

Shared One to One



Le Levier, Association pour la Cooperation avec la Micro Entreprise (ACME), and Association Nationale des Caisses Populaires Haitiennes (ANACAPH) have procured multiple copies of the same core banking software for the financial institutions that belong to their networks. In the

shared one to one model, the association or federation would likely contract with a software firm to build a custom interface between the shared banking software and the MNO's software. Subsequently each financial institution would assume responsibility to directly integrate with the provider but the software integration could be reused, thereby reducing overall costs. Additionally, the financial institutions could collectively decide to delegate some operational aspects of the product offering to the apex organization to share resources. This model still implies high start-up and operational costs due infrastructure and staffing requirements.

Advantages:

- Can interface with legacy core banking system.
- In mature markets may be less expensive due to removing payment intermediary.
- Low software development and maintenance costs. Costs can be distributed among multiple actors. Apex organization likely to achieve pricing discount.
- Some operational aspects can be shared.

Disadvantages:

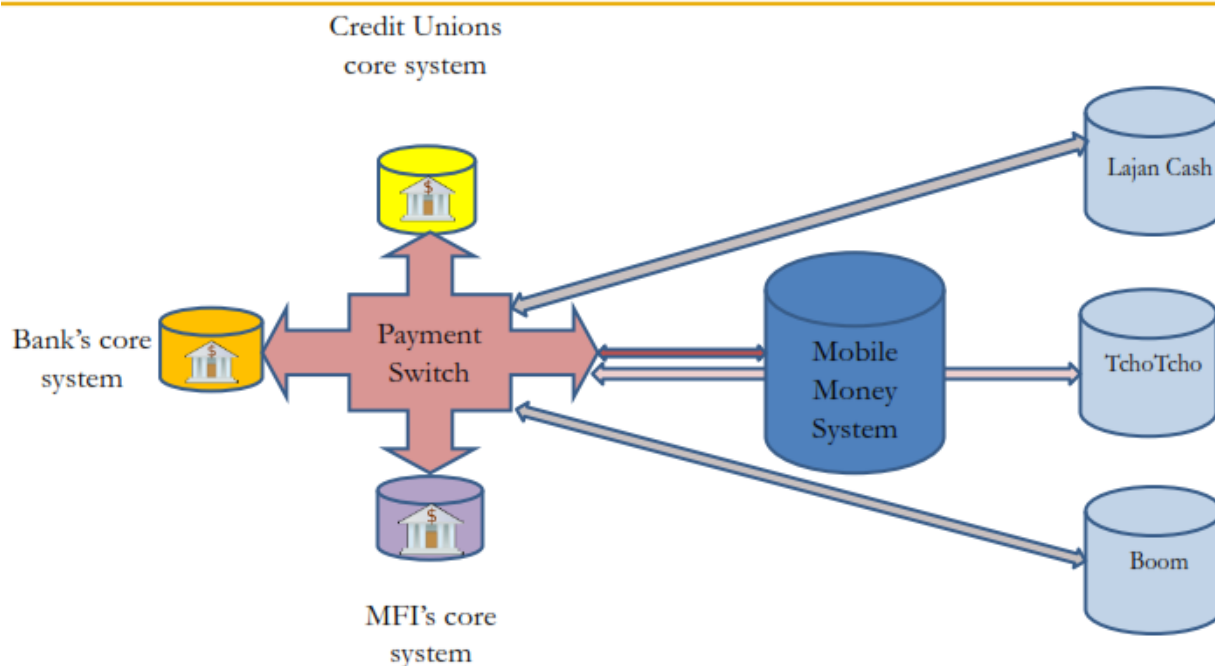
- Long time to market: many clients would need to agree to the same cost model and shared responsibilities.
- High start-up costs due to:
 - Medium operational costs. Process changes could be reused but each institution assumes responsibility over product.
 - High infrastructure costs. Costs cannot be distributed among multiple actors despite excess capacity.
- High cost to maintain due to:
 - Operational costs that can only partially be distributed among multiple actors.
 - High infrastructure costs that cannot be distributed among multiple actors.
- Requires specialized staff not usually available at financial institutions but some knowledge-sharing is possible.

Given these substantial disadvantages, this model is not ideal for use in Haiti.

C. Many to One to One (or Many) Model

In the Many to One to One (or Many) model, multiple financial institutions with varying core banking software systems form a network by creating an interface with a central switch provider who then connects to the mobile money provider and other payment networks. Though individual core banking interfaces need to be developed for each individual financial institution, the costs are lower than each financial institution creating an interface directly with the mobile money provider.

Many to One to One (or Many)



The Many to One to One (or Many) Model represents the aforementioned national switch utility model used in other markets. The model is also one which Le Levier, ACME, and ANACAPH would be ideally positioned to facilitate or participate in due to their status as apex organizations representing financial institutions. Under this model, the national government or a group of financial institutions jointly invest to create a payment company dedicated to switching financial transactions among the investors as well as external payment networks, including mobile money networks. Each financial institution would then directly connect to the payment company who, in turn, would connect with the mobile money provider (or other payment network). Each financial institution would likely still have to contract with a software firm to build a custom interface between its banking software and the switch but the payment company could help reduce costs by overseeing the integration and processes. Additionally, the payment company would significantly reduce operational costs per financial institution by assuming greater responsibility over operational processes. This would be accomplished primarily by sharing specialized technical staff resources to solve technical challenges across the network. This model still implies high start-up costs due to the infrastructure requirements but is likely the most plausible for Haiti. World Council of Credit Unions has successfully employed this model in several developing markets through its for-profit subsidiary, WOCCU Services Group, Inc. If BRH can feasibly adapt the national payment switch to include real-time settlement and other financial institutions, then the infrastructure start-up costs for this model would be reduced.

Advantages

- Can interface with legacy core banking system.
- Software neutral: payment switch can connect with any financial institution or mobile money provider.
- Low software development and maintenance costs per financial institution. Costs can be distributed among multiple actors and payment switch can reduce integration and on-boarding inefficiencies by overseeing process. Very likely to achieve pricing discount from software vendors.
- Low operating costs per financial institution. Most operational responsibilities assumed by payment switch.
- Reduces need for specialized staff at each financial institution.

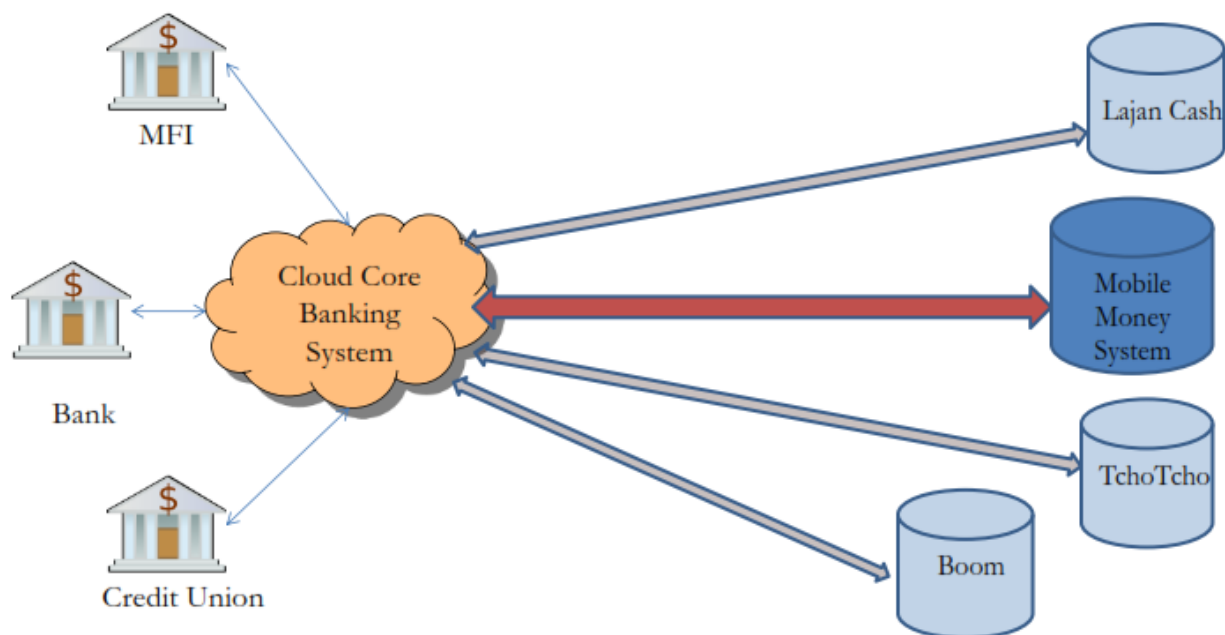
Disadvantages

- Very long time to market as many investors would need to agree on the same business model.
- Long return on investment: payment companies generally only become profitable once they have reached high transactional volumes.
- Medium start-up costs due to:
 - Low operational and software costs. Process changes can be reused.
 - High infrastructure costs. Most costs cannot be distributed among multiple actors despite excess capacity.
- Medium cost to maintain due to:
 - Low operational costs
 - High infrastructure costs that cannot be distributed among multiple actors despite excess capacity.
- Adds middleman which increases transaction costs assumed by the financial institution. (This is generally more than off-set by the lower start-up and operational costs however.)

D. One (or Many) to Cloud to One (or Many) Model

One or more financial institutions that all have the same cloud-based core banking platform can connect to a mobile money provider and other payment networks. Integration costs are indirectly paid by the financial institution via monthly fees to the vendor under a Software as a Service business model.

One (or Many) to Cloud to One (or Many)



The One (or Many) to Cloud to One (or Many) Model represents the likely future state of the banking and payments industries worldwide. Under this model, banking, switching, and payment software would all occur virtually via cloud computing offered by a single provider, greatly reducing local infrastructure and software costs. Put differently: instead of banking servers being physically located at each branch, each branch user would use an internet browser to access a centrally-located database housed in a third-party data center.

In Haiti, Boom Financial's technology most closely approximates this model in that today Haitian credit union users use a web browser to access Haitian mobile money accounts managed by servers in the United States. Boom's technology, however, is designed only to manage payment transactions and does not offer the type of functionality needed in banking systems (such as the ability to originate a loan or track loan repayments, for example). Nevertheless, today several banking software providers interviewed in Haiti are beginning to offer their software through the internet under "Software as a Service/Infrastructure as a Service" business models. Additionally, while "payment" and "banking" software today largely remain separate, start-up companies in the U.S. are now beginning to offer both as comprehensive "full-stack" financial software packages under a "Software as a Service/Infrastructure as a Service" business models. In sum: it is likely this type of service and business model will be available in Haiti soon.

Under this model each financial institution would likely still have to contract with a software firm to build a custom interface between its banking software and the mobile money provider but

integration costs would be significantly lower because the software could be remotely updated without the need to travel to Haiti. Costs would be assumed by the software provider (but paid for indirectly by the financial institution via a higher monthly fee or on a transactional basis). Additionally, this model would significantly reduce infrastructure costs per financial institution due to the centralized nature of the software and data. Operational costs remain high because it is assumed that a single financial institution would use this model rather than a network but a network would further reduce costs.

Although this is the direction the financial sector worldwide is moving, it is not a plausible model for widespread adoption in Haiti today. The greatest impediment to this model is the legacy software systems utilized by most Haitian financial institutions—migration from these systems is a complex topic beyond the scope of this report. The model is included to help educate Haitian financial institutions about the potential for this model so they may make prudent investment decisions over the next five to ten years.

Advantages:

- Short time to market—one client, one provider.
- Low start-up costs due to:
 - Medium operational costs. Process changes can only be used by one institution but technical operations are managed via by software provider.
 - Very low custom software development costs. Software integrations can be reused to integrate with other payment systems or by other financial institutions.
 - Very low infrastructure costs. Costs distributed among multiple financial institutions with flexible capacity.
- Low cost to maintain due to:
 - Medium operational costs: technical operations are managed by the software provider.
 - Very low infrastructure costs distributed among multiple actors.
 - Very low software costs distributed among multiple actors.
- Reduces need for specialized staff at the financial institution.

Disadvantages:

- Not possible unless most financial institutions replace their core banking system, which is very costly and time-consuming.
 - Core banking system software migration can require a 1-2 year data migration period where new clients are enrolled in the new software, while existing clients and their data is slowly migrated onto the new system. Both systems would be used in parallel until a point is reached when the new system has backed up all historical data and can become the new system of record for all client accounts.
- The Central Bank may require Haitian financial institutions to maintain their databases in-country. Given the size and technical capacity within the Haitian market, this makes adoption of this model less likely.
- Adds a middleman to the process thereby increasing the transaction costs assumed by the financial institution.

Model Comparison Chart				
Type	One to One	Shared to One	Many to One to One (or Many)	One (or Many) to Cloud to One (or Many)
Haitian example	N/A	Le Levier, Acme	N/A	Boom
Decision-Making	Fast	Slow	Average	Fast
Upfront Infrastructure Cost	Very High	High	High	Low
On-going Infrastructure Cost	Very High	High	High	Low
Upfront Software Costs	Very High	Low	Medium	Low
On-going Software Costs	Very High	Low	Medium	Low
Upfront Operational Costs	Very High	Very High	Medium	High
On-going Operational Costs	Very High	Very High	Medium	Medium (if not in network)
Compatible with Legacy Systems	Yes	Yes	Yes	No; replaces.
Potential Regulatory Constraints	No	No	No	Maybe-- infrastructure not located in Haiti.

As mentioned previously, achieving interoperability is not only a technical decision but also a business decision. The following sections focus on the purpose and methodology used to develop an Interoperability Cost-Analysis Tool for Haitian financial institutions to quantify the necessary investment decisions they would need to make to achieve interoperability.

V. Interoperability Cost-Analysis Tool

Based on the technical models presented above, the Interoperability Cost-Analysis Tool was created to enable financial institutions to analyze and compare the feasibility of each solution for themselves. This section outlines the reasoning, assumptions, and logic behind this tool, thereby making it useful for Haitian financial institutions. To enhance its validity, the tool was developed, refined, and finalized after incorporating feedback from several Haitian financial institutions throughout the process. The assumptions that underlie the tool are as follows:

- **The costs are approximate but accurate at the time of publication.**

Where possible the authors have used real but generalized numbers obtained from a variety of financial institutions, software providers, and IT experts to demonstrate the potential viability of interoperability. The authors interviewed Haitian financial institutions (two MFIs, two banks, and two credit unions) three local software providers, and all three mobile money providers. However, because of the lack of locally available IT services in Haiti, the Interoperability Cost-Analysis Tool also makes several cost assumptions based on conditions in other markets. These assumptions are based on the authors' collective experience in the industry as well as quotes from providers but would need to be validated against current conditions in Haiti if the Interoperability Cost-Analysis Tool were to be relied-upon for making procurement decisions.

- **Opening a new branch is a relevant investment alternative to mobile money.**

An initial assumption was made that financial institutions would consider a new branch opening as the likely best available alternative to investing in interoperability. It was further assumed that projected net loan income would be the primary investment indicator for financial institutions as loan income is their primary source of revenue.

These assumptions were validated. All financial institutions interviewed agreed that the easiest measurement on return would be to compare profit on loans and that a new branch opening was a useful conceptual tool they were comfortable with in order to analyze the opportunity presented.

- **The rate of return should be five years.**

Mobile banking possesses the distinct long-term advantage over a branch in that a single platform could be used by as many clients as the financial institution is willing to serve while a new branch is limited to only serving clients within a specific geographic service radius. Consequently, all things equal, a financial institution should prefer mobile banking over a new branch if the rate of return is the same or comparable. According to the financial institutions interviewed, a new branch realistically takes approximately four to five years to generate a return even though most had initially projected a shorter time period. The Interoperability Cost-Analysis Tool assumes a five year time-horizon to strengthen the branch/mobile comparison.

- **Loan size, duration, and quantity vary significantly between financial institutions.**

Loan portfolio composition varied significantly among financial institutions. Unsurprisingly, the banks interviewed tended to emphasize the number of "quality loans" they possessed, focusing on lower risk of loss with a greater return on interest for larger loans. Bank-owned MFIs tended to focus on offering business loans to formal small and medium enterprises. Credit unions and independently-run MFIs were more dependent on shorter consumption loans and needed a quick return on any loan type because they did not have the liquidity available for longer term loans. Because of this variability the Interoperability Cost-Analysis Tool makes general assumptions about the financial institution's expected loan portfolio composition. These loan assumptions

would need to be updated by the financial institutions before using the Interoperability Cost-Analysis Tool.

- **Financial institutions did not perceive mobile banking to be too operationally risky but are concerned about client acceptance.**

The Haitian financial institutions interviewed did not perceive mobile banking to be non-viable because of operational risks. In fact, as mentioned previously, bank-led MFIs went so far as to note that mobile banking would be a particularly attractive alternative for rural towns without bank branches as it was typically hard for banks to justify the cost of opening a new branch despite high demand for loans.

Financial institutions did view mobile banking as “riskier” fearing lack of client acceptance as a result of a lack of trust and knowledge in this new service method. For example, in creole one of the few ways to describe mobile banking is to say money “in” the phone, which creates for many a misperception that funds are literally in their phone, and if the phone is lost, so would be their savings. The Interoperability Cost-Analysis Tool template incorporates these viewpoints by assuming additional transportation costs relating to remotely delivering financial services outside of the branch while also increasing the ramp-up period required for the mobile banking solutions.

- **Loan income, not fee revenue, should drive profitability.**

In general most of the financial institutions interviewed would like to see mobile banking revenue mirror the revenue opportunities that exist today which work and are profitable. When questioned whether clients should pay a fee to perform a mobile transaction almost all financial institutions interviewed agreed that charging to make deposits did not make much sense because it penalized adding money to the system. Additionally, some financial institutions thought charging for loan withdrawals would be counter-productive because the purpose of the loan was provide access to liquidity. As a contra example, however, one credit union felt their clients would gladly welcome and absorb the additional cost per loan payment, since they had no other options outside of traveling a long distance to access a branch. The Interoperability Cost-Analysis Tool assumes a minimal amount of fee revenue from agent services and remittances but doubles the percentage for loan provisions under remote models in order to stress-test the model.

The Interoperability Cost-Analysis Tool incorporated the above financial sector insights to form the conceptual model under which to analyze interoperability. This led to the following findings and recommendations.

VI. Findings and Recommendations

Based on current market conditions, financial sector insights, and cost inputs provided by financial institutions, software vendors, and IT professionals, the report makes the following findings and recommendations.

A. Findings

1. **Integrating with a mobile money provider (e.g. achieving interoperability) is a viable investment for Haitian financial institutions to consider.** While many of the inputs would need to be further validated against actual costs, the Interoperability Cost-Analysis Tool template demonstrates that the investment needed to achieve interoperability is feasible and roughly comparable to that of opening a branch office.
2. **Haitian financial institutions are better off approaching interoperability as a network or group rather than individually.** Regardless of the technical model employed, approaching interoperability as a network significantly reduces costs per financial institution due to the ability to share or distribute costs and responsibilities among multiple actors.

B. Recommendations

1. **Policy-makers should support the creation of a national Haitian payment switch.** One of the report's repeated observations was the frequency which Haitian financial institutions and mobile money provider had tried and subsequently failed to increase their use of mobile money due to technical deficiencies. While the formation of a national payment switch requires both a significant capital expenditure and a long-term investment horizon, the pay-off for mobile money would be almost immediate. A payment switch would not only reduce costs but also improve technical decision-making and integration execution. Further, a national payment switch would not necessarily be limited to only the financial sector; its resources and integration points could be leveraged by any sector with the desire and resources necessary to integrate with mobile money.
2. **Financial institutions should review and consider off-line processing solutions to overcome the lack of infrastructure in Haiti.** While examining the details of off-line processing (sometimes referred to as "Card-on-File" processing in the card world) is beyond the scope of this report, it is possible for a processor or payments switch to authorize transactions under certain conditions on behalf of a financial institution when the financial institution's infrastructure loses connectivity. This would significantly reduce the infrastructure requirements for the financial institution. While analyzing the infrastructure was beyond the scope of this report, it was clear from the interviews that infrastructure, specifically data communication, remains a key challenge throughout much of Haiti.
3. **Policy makers should reconsider the role financial institutions play in mobile money.** Based on M-Pesa, the development narrative has long asserted that telecom-led payment systems must drive early adoption in order for mobile money to scale. This assumption is at odds with the current situation in Haiti. The Interoperability Cost-Analysis Tool conceptually demonstrates that mobile banking is a financially-viable alternative to consider in Haiti. Additionally, almost every major payment system before M-Pesa was functionally "bank-led." (To name three: Visa, Mastercard, and SWIFT all started as, or remain, bank-owned institutions.) Therefore, the regulators and financial institutions must

recognize that it is likely necessary for the financial sector to be the leaders in developing and implementing mobile money if it is to successfully be adopted on a mass scale in Haiti.

Annex A: Interoperability Cost-Analysis Tool - User Guide

Purpose

The purpose of the Excel “Interoperability Cost Analysis Tool” found in Annex B is to help financial institutions determine the feasibility and profitability of implementing a mobile money service within their institution. There are four different business models representing different methods under which mobile money could be implemented, as well as a baseline: establishing a new brick and mortar branch location. This tool is setup so that each financial institution can change the assumptions based on their individual needs and assessments in order to compare and contrast the different models.

Model Assumptions

1. All numbers are in USD
2. The highlighted blue cells are the only cells that can be modified. The non-highlighted cells contain formulas **DO NOT EDIT THEM.**

Model Definitions

1. **New Branch** – Model to project a brick and mortar branch in a new location.
2. **One to One** – A single financial institution connects directly with a mobile money provider
3. **Shared One to One** – Many financial institutions that share the same core banking software form a network to connect with a mobile money provider. Many costs, such as integration, regulatory compliance, and training can be shared amongst the network of financial institutions.
4. **Many to One to One (or Many)** – Many financial institutions with varying core banking systems form a network by each creating an interface with a central switch provider, who then connects to the mobile money provider and other payment networks. Though individual core banking interfaces need to be developed for each individual financial institution, the costs are lower than each financial institution creating an interface directly with the mobile money provider.
5. **One (or Many) to Cloud One to One (or Many)** – One or more financial institutions that all have the same cloud core banking platform connect to a mobile money provider and other payment networks. Integration costs are indirectly paid by the financial institution via monthly fees to the vendor under a Software as a Service business model.

Step 1 – Determine the Dashboard Assumptions

hypothèses	nouvelle succursale		Un à Un		Partagée Un à Un		Un (ou plusieurs) à un à un (ou plusieurs)		Un (ou plusieurs) à Cloud à Un (ou plusieurs)	
	Nombre de mois prévus pour les taux de retour sur investissement	60	60	60	60	60	60	60	60	60
Montant cumulé des prêts mensuels	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Temps de montée (mois)	12	18	18	18	18	18	18	18	18	18
Valeur moyenne du prêt par prêt	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500
Taux d'intérêt sur les prêts (par mois)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Taux d'épargne (coût des fonds) par mois	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Nombre de "retrait" par mois (par exemple, transfert et services offerts par les agents)	300	-	-	-	-	-	-	-	-	-
Commission moyenne des institutions financière sur les retraits	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50
Autres sources de revenus / sur les prêt par mois	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Nombre d'officiers de crédit à distance	-	4	4	4	4	4	4	4	4	4
Pourcentage de rabais - Coût d'opportunité	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Provisions pour mauvaises créances en pourcentage	10%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Nombre des IF (Institutions Financière)	1	1	1	30	30	30	30	30	30	30
Coût total de démarrage	\$ 450,500	\$ 434,000	\$ 434,000	\$ 479,000	\$ 479,000	\$ 275,000	\$ 275,000	\$ 108,000	\$ 108,000	\$ 108,000
Coût total de démarrage par FI	\$ 450,500	\$ 434,000	\$ 434,000	\$ 70,100	\$ 70,100	\$ 242,133	\$ 242,133	\$ 108,000	\$ 108,000	\$ 108,000
Temps avant le début des opérations (semaine)	92	134	134	130	130	130	130	130	130	130
Retour sur investissement initial (mois)	20	#N/A	#N/A	20	20	23	23	13	13	13
Total de revenu	\$ 1,085,400	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000	\$ 1,080,000
Total des dépenses	\$ 650,520	\$ 975,780	\$ 975,780	\$ 928,020	\$ 928,020	\$ 781,650	\$ 781,650	\$ 708,720	\$ 708,720	\$ 708,720
Revenu Net	\$ 434,880	\$ 104,220	\$ 104,220	\$ 151,980	\$ 151,980	\$ 298,350	\$ 298,350	\$ 371,280	\$ 371,280	\$ 371,280
Revenu net cumulé	\$ 1,470,578	\$ (255,022)	\$ (255,022)	\$ 364,735	\$ 364,735	\$ 941,854	\$ 941,854	\$ 1,444,320	\$ 1,444,320	\$ 1,444,320
Taux de rendement interne	158%	-17%	-17%	54%	54%	122%	122%	3099%	3099%	3099%
VAN Valeur actualisée nette	\$ 1,125,317	\$ (296,087)	\$ (296,087)	\$ 255,654	\$ 255,654	\$ 711,192	\$ 711,192	\$ 1,139,019	\$ 1,139,019	\$ 1,139,019

In the first tab of the tool, review the assumptions. The values in the highlighted blue cells were averages and can be modified for your financial institution. Any changes to the blue cells will automatically adjust the formulas.

Dashboard Line Item # Definitions:

1. Titles
2. The time frame of the project. This time frame can be changed to analyze the different models at a 3, 4, and 5 year projection.
3. Cumulative amount of loans disbursed for any given month. As an example, if a financial institution 1,000 loans disbursed at the beginning of a month, 80 of those loans are paid back within the month, and 90 additional loans are disbursed all during the same month, then there was a cumulative loan disbursement of 1,010 loans for that month. This model uses a cumulative amount of loans disbursed, and then multiplies that cumulative by the monthly loan rate in order to calculate monthly loan revenue.
4. Amount of time it will take to reach the cumulative amount of loans disbursed each month.
5. The average loan value for each of the loan disbursements.
6. The monthly interest rate charged to the cumulative amount of loans to calculate the monthly loan revenue. As an example, if there were 1,000 cumulative loans disbursed, at an average loan value of \$1,500, at a monthly rate of 3%, then the monthly loan revenue would be \$45,000 (Number of Cumulative Loans Disbursed*Average Loan Value*Monthly Rate = Monthly Loan Revenue).
7. The monthly cost of funds used for funding the loans. Used to calculate the monthly cost of funds (Cost of Funds*Number of Cumulative Loans Disbursed*Average Loan Value = Monthly Cost of Funds).

8. Branch locations that deal with cash transactions can provide other revenue streams by offering cash-in/out services for remittances and agent networks. This amount specifies the average number of transactions a branch office can transact on a monthly basis. Only the “New Branch” model allows for this additional revenue source because it is the only model that deals with cash at the service location.
9. The average commission for the cash-in/out services detailed in line item 8. Agent cash in/out revenue is calculated by: $\text{Average Cash In/Out Transactions} * \text{Average Commission for Cash In/Out Transaction}$.
10. Other payment income streams are the other sources of revenue that the mobile models can generate. Examples include air time top-ups, service payments (welfare payments, utility payments, etc.), mobile money transfers, etc. This is a monthly total of commissions that is calculated by multiplying the cumulative number of loan disbursements by the other payment income streams.
11. Within the mobile models, it is assumed that there will be a number of remote loan officers who will be providing the service of loan origination to the new clients/members, instead of the members traveling to the existing branch locations of the financial institution. The number of loan officers is set forth in this line item.
12. The discount rate is used to calculate the Net Present Value calculation for line item 24. The discount rate is the opportunity cost of funds for investing in some other activity rather than the proposed models.
13. Loan loss provisions is the percentage of the monthly loan revenue that will need to be set aside for loan loss provisioning. The monthly loan loss provision calculation is as follows: $(\text{Monthly Loan Revenue} * \text{Loan Loss Provision Percentage} = \text{Monthly Loan Loss Provision Expense})$.
14. The number of financial institutions that are part of the technology network to share the related startup and operational costs.
15. Total startup costs for the entire model
16. Total startup costs for every financial institution within the business model
17. Time to complete all of the startup items. This is a linear calculation and the critical path was not calculated.
18. The time it would take (in months) to earn back the initial investment from the cumulative net income.
19. Total projected annual revenues at the end of the projected period that was set forth in line item 2.
20. Total projected annual expenses at the end of the projected period that was set forth in line item 2.
21. Total projected annual net income at the end of the projected period that was set forth in line item 2.

22. Total projected cumulative net income at the end of the projected period that was set forth in line item 2.
23. The total return of the entire project for the projected period that was set forth in line item 2. Not to be confused with the time for return on investment. An example would be an investment for a new branch:
 - a. Initial Cost: \$500,000
 - b. Time for return on Investment (Break-even): 20 months
 - c. Internal Rate of Return: 36%
24. Taking into account the opportunity cost of funds, the Net Present Value calculates the revenues received over the time period and calculates how much the investment would be worth in the present day.

Step 2 – Define the Startup Costs

In the second tab are the costs associated with opening a new branch. On the top are the one time startup costs. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

Startup Costs/Timeline			
		Cost (USD)	Timeline (weeks)
Real Estate Costs			
	Buying Land	\$ 100,000	20
	Construction Costs	\$ 250,000	30
	Rent Land and Building + Renovation Costs	\$ -	-
	Total Real Estate Costs	\$ 350,000	50
Administrative			
	New Branch Location Analysis	\$ 3,000	3
	Contractual agreements for building	\$ 4,000	4
	Design definition	\$ 2,000	2
	Other fixed assets	\$ 50,000	5
	Human Capital Acquisition (HR)	\$ 7,000	7
	Training	\$ 5,000	2
	Marketing	\$ 5,000	1
	Modify/implement policies and procedures	\$ 2,000	5
	Total Administrative	\$ 78,000	29
IT Infrastructure			
	Servers	\$ 2,000	3
	Internet	\$ 3,000	2
	Data Communications Hardware	\$ 1,000	3
	Security	\$ 1,500	1
	Power (Generators, batteries, inverters, etc)	\$ 10,000	2
	One time software license fees	\$ 5,000	2
	Total Technical	\$ 22,500	13
	Total Startup Costs/Timeline	\$ 450,500	\$ 92

New Branch Startup Costs Definitions:

1. Real Estate Costs

- a. **Buying Land** – the purchase of new land for the new branch office location.
- b. **Construction Costs** – Costs to construct the new branch office building.
- c. **Rent Land and Building + Renovation Costs** – These are only the startup costs associated for entering into a rental or lease agreement for a new branch office

location. The monthly rent/lease amounts should be placed below within the operational costs.

2. Administrative

- a. **New Branch Location Analysis** – the market analysis undertaken to determine the location of the new branch office location.
- b. **Contractual agreements for building** – costs associated.
- c. **Design definition** – costs associated for the design of the new branch office location.
- d. **Other fixed assets** – computers, desks, chairs, vault, etc.
- e. **Human Capital Acquisition (HR)** – employees who will be working within the new branch.
- f. **Training** – costs involved for training the new personnel. These include salary paid, travel expense reimbursements, food, and hotel.
- g. **Marketing** – costs associated for printing of new marketing materials to be used for the new branch location.
- h. **Modify/implement policies and procedures** – definition of and implementation and/or modification of new policies and procedures that would need to be implemented for the new branch office location.

3. IT Infrastructure

- a. **Servers** – additional servers that are required to connect the branch location to the central core.
- b. **Internet** – communications required per the above.
- c. **Data Communications Hardware** – communications per the above.
- d. **Security** – IT security costs.
- e. **Power (Generators, batteries, inverters, etc.)** – self explanatory
- f. **One time software license fees** – software license fees relating to applications and operating systems installed on branch workstations, servers, other hardware, as well as software products relating to general business operation.

Similar to the second tab, the remaining tabs list the one time startup costs for each of the integration models. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

Coûts de démarrage /chronologie	coûts (USD)	Temps (semaines)
Administratif		
Frais juridique, frais de révision de conformité et approbation (réglementation et marchés)	\$ 25,000	26
Recrutement du personnel (Agent de crédit et équipe informatique)	\$ 8,000	12
Formation	\$ 8,000	12
Marketing	\$ 10,000	4
Transport pour les agents de crédits	\$ 20,000	3
modifier/Mise en œuvre des politiques et procédures	\$ 30,000	12
Total Administratif	\$ 101,000	69
Infrastructure		
nouveau matériel pour les bases de données	\$ 25,000	12
Installation Internet(si nouveau)	\$ 2,000	1
Interface principale - Une License (si nouveau)	\$ 35,000	4
Data Communications Hardware	\$ 1,000	24
Intégration avec le fournisseur de Banque mobile	\$ 250,000	12
Mise à jour et vérification des politiques et procédures de sécurité informatique/Audit	\$ 20,000	12
Total Infrastructure	\$ 333,000	65
Total coûts de démarrage / chronologie	\$ 434,000	\$ 134

Remaining Model Startup Cost Definitions:

1. Administrative

- a. **Legal and Compliance Review and Approval (Regulatory and Contracting)** – Costs associated for receiving regulatory permission to provide the service within your financial institution.
- b. **Staffing Recruitment (Remote Loan Officers + IT Staff)** – costs associated for hiring the new remote loan officers and IT Staff.
- c. **Training** – training costs for the new employees.
- d. **Marketing** – costs for the design and printing of new marketing materials for the launch and service of the model.
- e. **Transportation for remote loan officers** – purchase costs for the remote loan officer’s transportation.
- f. **Modify/implement policies and procedures** – the costs associated for the modification and implementation of new policies and procedures (loan underwriting, security, etc.) associated for launching the associated business model.

2. Infrastructure

- a. **New Hardware for Data Center** – Hardware costs associated for the business model.
- b. **Internet installation (if new)** – new internet connections where applicable.
- c. **Core Interface - One License (if new)** – interface costs for the respective business models.
- d. **Data Communications Hardware** – hardware required for the data connections amongst the network or related parties.
- e. **Integration with Mobile Money Provider** – this line item varies between the different business models depending upon which entity is required to create the line

of integration. However, it is referencing the cost associated for that data integration.

- f. **Update/audit IT security policies and procedures** – similar to the administrative policy and procedure modification line item above, except now applying to the IT policies and procedures.

Step 3 – Define the Operational Costs

Farther down on the second tab are the costs technical and operational costs associated with managing a new branch. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

52		Operating Expenses		
53		Internet Service	\$	1,000
54		Rent or lease of land/building monthly expense	\$	-
55		Data infrastructure cost	\$	500
56		Core software license support and maintenance	\$	83
57		Number of Employees		10
58		Monthly Salary (with benefits)	\$	330
59		Total Employee Cost	\$	3,300
60		IT Staff	\$	300
61		Cost of Cash Management (armored cars, etc)	\$	6,000
62		Total Operating Expenses	\$	11,183
63				
64		Earnings before Interest and Tax		
65		Interest Expense		0%
66		Taxes		10%
67				

New Branch Operational Costs Definitions:

1. Operating Expenses

- a. **Internet Service** – monthly cost for internet
- b. **Rent or lease of land/building monthly expense** – monthly cost for the rent or lease of land and/or building.
- c. **Data infrastructure cost** – monthly cost for the data warehousing.
- d. **Core software license support and maintenance** – additional core banking software monthly costs associated for opening a new branch location.
- e. **Number of Employees** – number of employees that will be contracted.
- f. **Monthly Salary (with benefits)** – average monthly salary of the employees, benefits included.
- g. **Total Employee Cost** – total monthly cost for all employees within the new branch.
- h. **IT Staff – IT staffing costs.** This line item was separated due to the cost differences between the IT and Administration salaries.
- i. **Cost of Cash Management (armored cars, etc.)** – Total monthly costs associated for contracting armored cars for the administration of cash with the new branch office.

Similar to the second tab, the remaining tabs list the operational costs for each of the integration models. The values in the highlighted blue cells were averages and can be modified for your financial institutions. Any changes to the blue cells will automatically adjust the formulas.

46				
47		Operating Expenses/month		
48		Internet Service	\$	100
49		Data infrastructure cost	\$	500
50		Software support and maintenance	\$	200
51		IT Staff	\$	4,000
52		Salary (with Benefits)/employee	\$	800
53		Transportation/employee	\$	200
54		Other Costs	\$	500
55		Total Operating Expenses		
56				
57		Software Licensing/Provider Costs		
58		Core interface - monthly support	\$	583
59		Switch integration - monthly support	\$	1,667
60		Other costs/month	\$	500
61		Total Software Licensing/Provider Costs		
62				
63		Total Operating/Software Expenses		
64				
65		Earnings before Interest and Tax		
66		Interest Expense		0%
67		Taxes		15%
68				

Remaining Model Operational Cost Definitions:

1. Operating Expenses

- a. **Internet Service** – monthly cost for internet.
- b. **Data infrastructure cost** – monthly cost for the data warehousing.
- c. **Software support and maintenance** – monthly cost for the operational support and maintenance software.
- d. **IT Staff** – monthly expenses for the IT staff
- e. **Salary (with Benefits)/employee** – monthly expenses for the remote loan officers.
- f. **Transportation/employee** – monthly transportation expenses for the remote loan officers.
- g. **Other Costs** – other costs associated for the operational business model.

2. Software licensing/Provider Costs

- a. **Core interface - payment module - monthly support** – the monthly core interface cost for the respective business models.
- b. **Mobile money provider integration - monthly support** – the monthly integration cost with the mobile money provider.
- c. **Other costs/month** – self-explanatory.

Operational Revenue/Expense Calculations

Below is an explanation of the mathematical formulas used to calculate the revenue and return on interest for all the models. These line items are found in the tabs for each model under the label “implementation.”

1. Month	Number of months for the project
2. Number of Loan Disbursements	First the loan disbursements increase according to the ramp up time, at which point the loan disbursements will stay constant at the cumulative amount of monthly loans value.
3. Revenues	
a. Loan Revenue	Number of loans for the period*Average Loan value per Loan*Loan Interest Rate
b. Agent Cash In/Out Revenue	Number of Cash In/Out transactions*Average commission to FI for cash out services
c. Payments Revenue	Other payment income streams*Number of loans for the period
i. Total Revenues	Sum of the last three line items
4. Product Expenses	
a. Cost of Funds	Number of loans for the period*Savings Interest Rate (Cost of Funds)
b. Loan Loss Provisions	Loan Revenue for the period*Loan Loss Provision rate
i. Total Product Expenses	Sum of last two line items
5. Profit Margin	Total Revenues – Total Product Expenses
6. Operating Expenses	
a. Internet Service	Fixed value across all months
b. Data Infrastructure Cost	Fixed value across all months
c. Software Support and Maintenance	Fixed value across all months
d. IT Staff	Fixed value across all months
e. Salary (with Benefits)/Employee	Fixed value across all months

f. Transportation/Employee	Fixed value across all months
g. Other Costs	Fixed value across all months
i. Total Operating Expenses	Sum of last seven line items
7. Software Licensing/Provider Costs	
a. Core Interface	Fixed value across all months
b. Mobile Money Provider Integration	Fixed value across all months
c. Other costs	Fixed value across all months
i. Total Software Licensing/Provider Costs	Sum of last three line items
ii. Total Operating/Software Expenses	Total Operating Expenses + Total Software Licensing/Provider Costs
8. Earnings Before Interest and Tax	Profit Margin – Total Operating/Software Expenses
a. Interest Expense	Fixed value across all months
b. Taxes	Once Earnings before Interest and Tax is above zero then the tax rate begins to apply.
i. Net Income	Earnings before Interest and Tax – Interest Expense - Taxes
1. Cumulative Net Income	Sum of all previous Net Income periods

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