ELECTRONIC PAYMENT SYSTEMS 201

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Introduction to Mobile Money

Disruptive innovation in the payments sector—and indeed the retail financial services industry—does not occur frequently. This is partly due to the dominant position of the incumbent players (primarily banks and payment networks), and partly due to the nature of the sector itself: as they relate to people's money, banking and payments are not only inherently conservative, individuals have a lower threshold of risk to experiment with new players or new forms of doing business that dramatically change the status quo.

Recently, however, one of the most disruptive changes to the payments business model has been taking shape in several emerging markets—in some cases led by banks, in others led by an unlikely player: mobile network operators (MNOs). The concept has been dubbed "mobile money". In mobile money programs operated by MNOs, customers of the mobile network operator can deposit cash in one of the many retail agents it manages, in much the same way these customers buy prepaid airtime. The difference is that this amount is effectively converted to electronic currency on the customer's mobile handset; from there, customers can navigate a simple menu on their handset (onthe mobile's SIM card) or enter a series of text messages (either SMS or a more sophisticated form, called USSD) to send money to another user, pay bills, buy airtime, or withdraw money (at the same network of retail agents). Bank-led mobile money services work in similar fashion, often using prepaid accounts (see text box), except they often have to build a retail network or leverage an existing one.

Mobile Money as Prepaid Accounts

Mobile money most often works with prepaid accounts, more formally defined as Stored Value Accounts (SVAs). In contrast to a debit account, which is necessarily tied to a checking or savings account at a regulated deposit-taking institution, an SVA can be operated by any third party. Retailer gift cards or subway transit cards are examples of SVAs where money must be first deposited before being used at the merchant site. Although the aggregate consumer funds are held in a single pooled account at a commercial bank, MNOs take responsibility for the individual customers' SVAs themselves, and either manage them in-house or through its technology partner.

From the first implementations in the Philippines in the early 2000s, a plethora of MNOs—more than 240 worldwide at time of writing—have launched mobile money operations over the last 5 years. Early on, MNOs considered mobile money to be means to gain incremental revenue and increase customer loyalty to its core voice and data businesses. Today, MNOs are beginning to see mobile money as, potentially, a core revenue driver. Although only a few mobile money operations have currently scaled to over 1 million active users, the figures behind M-Pesa, a product launched in 2007 by local Kenyan operator Safaricom, are proof why it has served as the poster child of the nascent sector: by end of 2013 it had just under 17 million active users (out of a population of roughly 22 million between the ages of 15-64), 81,000 agents, and nearly $1 billion USD processed by its platform every month.

[1] To mitigate risk of non-payment for the MNO, in developing countries roughly 80% mobile accounts are "prepaid" (or pay-as-you-go), rather than the "post-paid" (or contract) accounts which are standard in developed markets.

Because of the transformational potential it can have in banking, payments, and financial inclusion in emerging markets, this brief will focus exclusively on mobile money: its similarities and differences to traditional payment systems discussed in Electronic Payment Systems 101, and potential to create a system that interconnects not only other mobile money programs but the banking and payment systems as well.

How does Mobile Money relate to Digital Financial Services?

The umbrella term "digital financial services" encompasses all financial services accessed by or delivered via electronic channels. Those financial services (payments, savings, credit, insurance, and other value-added services) can be accessed using a variety of electronic instruments, including mobile phones, point-of-sale devices, electronic cards (credit, debit, or smart cards), key fobs, and computers. A key class of digital financial services is "mobile money"—electronic money accessed or used through mobile phones. Electronic payments can be facilitated through mobile money, along with other electronic channels, like cards.

Impact on Financial Inclusion

The impact of payments on financial inclusion—whether it be savings, loans, remittances, or basic payments—can be significant. Prepaid accounts provide customers with a safe way to store money, and an easy way to withdraw cash if needed. Thanks to the recent emergence of alternative credit-scoring techniques using mobile money transaction data, customers previously denied small bank loans are starting to receive them from MNOs with little paperwork.

The cost and risk of sending money to a family member over long distances—previously done by entrusting a truck driver or friend with cash to deliver by hand—has dropped dramatically. A number of pilots have focused on business-to-business payments, such as consumer goods companies enabling mobile payments acceptance from thousands of small merchants And where previously paying an electricity bill meant standing in line for several hours (possibly resulting in lost income), mobile money enables instant payments from a mobile handset—anytime, anywhere. From a customer's standpoint, there is a significant impact: in the (admittedly unique) case of Kenya, just two years after M-Pesa's launch, 92% users claimed in a survey commissioned by Financial Sector Deepening (FSD) Kenya that if mobile money were no longer available, it would negatively impact their life. Moreover, traditional branch-based banking models remain too expensive to serve low-income communities, particularly in hard-to-reach rural areas (see more from "Digial Finance: A Handbook for USAID Staff").

Mobile Money as a Payment System

Even though for the most part it is not led by banks, mobile money certainly appears to take the form of an electronic payment system: money is digitized on a consumer's phone and can be used for a host of payment purposes.

One nuance is that as defined in the Electronic Payment Systems 101 brief, consumer payments are used to transfer money usually in exchange for good or service from one party (the consumer) to another (the merchant). While there are some payment services enabled where the merchants are not retail but "online" (e.g., a utility company), the bulk of many mobile money transactions worldwide are Person-to-Person (P2P) transactions, rather than Person-to-Merchant transactions (P2M). That being said, it is not clear what proportion of those P2P transactions from a consumer perspective are actually intended as a payment for a good or service: if a user sends money to a taxi driver via mobile money, while it is registered as a "P2P" transaction, it would be considered as a payment to a recipient acting as a merchant rather than another individual.

While most mobile network operators offering mobile money do not offer retail P2M services and thus do not manage merchants, they are responsible for selecting, managing, and building a retail agent network to perform the crucial "cash-in" (converting cash to mobile money) and "cash-out" (converting mobile money to cash) services. These agents are sometimes referred to as "human ATMs" and in fact an MNO's relationship with them is not unlike a bank's responsibility of managing its own fleet of ATMs. Many of these agents are retail stores already selling standard consumer good products, and are exclusive to a mobile money operator. If they work with multiple mobile money providers, they typically have separate platforms for each one. Unlike bank ATMs, where in most markets a consumer of one bank can withdraw money of an ATM belonging to another bank, there is therefore no "interoperability" (a concept discussed in the next section) for mobile money agents: a consumer on one mobile money platform would have to find an agent that was managed by the same provider to complete the transaction.

In this sense, most mobile money systems most closely resemble a three-party payment system. As described in Electronic Payment Systems 101, this model is most commonly associated with American Express and Discover. **Figures 1** and **2** on the following page depict the four-party and three-party models; **Figure 3** describes the mobile money model using the three-party payment framework.

Figures 2 and 3 appear similar, with three notable exceptions:

- The first is that MNOs manage agents and not merchants (though there are starting to be some exceptions[2]) and they offer prepaid mobile money accounts, rather than credit accounts as is usually the case for 3-party models. This has important financial implications: while credit providers derive significant interest revenue from consumers (and secondly, from fees charged to merchants), mobile money providers make the bulk of their direct revenue from the consumer side, and mainly from person-to-person transfers. (In fact, they pay their agents to manage cash-in and cash-out transactions, as well as account opening). Note that only in rare cases (such as in the Philippines) are non-bank providers allowed to earn interest from the "float" deposited by customers.

- Second, MNOs which offer mobile money derive two additional benefits: reduction of overall commission paid to agents (by enabling prepaid airtime to be purchased directly from the consumer's handset) and increased loyalty to its

[2] Safaricom in Kenya now offers a P2M service, which allows retail merchants to accept mobile money as a form of payment. Over 36K merchants have so far signed up, and pay 1% of the purchase value of the transaction. Tigo in Paraguay also offers a similar service, though this uses the merchant's POS machine rather than its phone.

TRANSACTION PROCESSING IN-DEPTH

FIGURE 1. **Four-Party Model (see Electronic Payment Systems 101 for more details).**

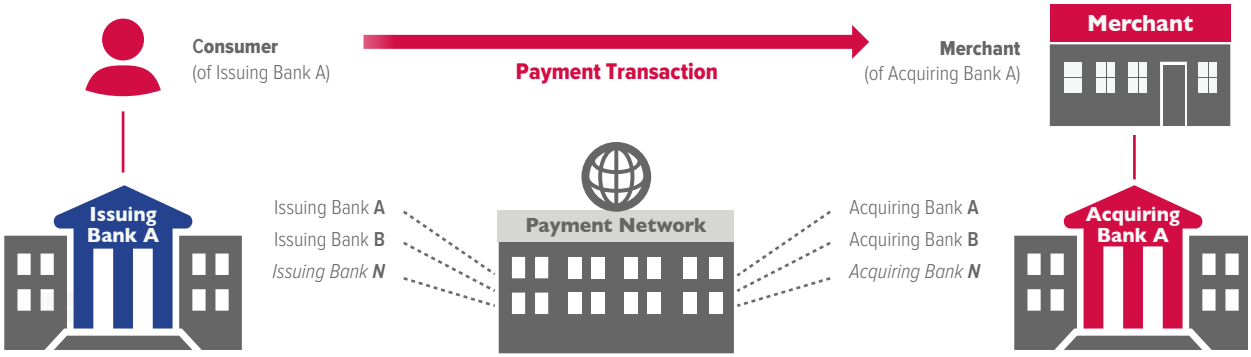


FIGURE 2. **Three-Party Model.** Note that in contrast to Four-Party models, these are necessarily closed-loop and the institution owns the relationship with both consumer and merchant

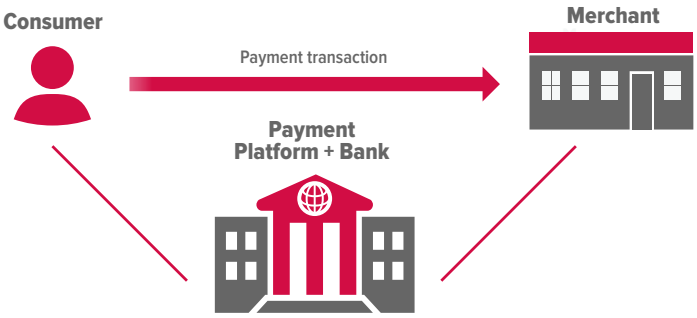
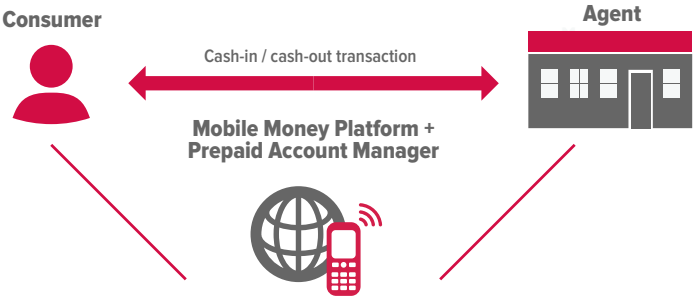


FIGURE 3. **Mobile Money Model.** The providers are generally mobile network operators offering prepaid (or stored-value) accounts. Note: Person-to-Person transfers not shown.



voice and data service.(It should be noted that as more MNOs offer mobile money, this second benefit becomes less of a competitive advantage and more of a "standard offering" expected by consumers.)

- The third, though it is not depicted in the figures, is that mobile money models take advantage of the existing "hardware" (i.e., phones) already in possession by the consumer and agent, while traditional payment models have to issue or install new ones (cards for consumers; Point-of-Sale terminals for retail merchants).This decreases the overall operational costs for the provider, as well as making the registration process simpler for consumers and merchants alike.

Defining Interoperability

Because mobile money systems act as a hybrid 3-party models, they are also closed-loop: in other words, no other participants are involved. This also means, with a few exceptions, that there has been practically no interoperability to-date among various mobile money schemes. In other words, very few two-way interactions[3] have been enabled between a consumer using mobile money scheme A and another consumer using mobile money scheme B; the same applies for agents. Furthermore, mobile money services are almost always limited for domestic use (in other words, no cross-border transactions), even when a provider offers the same mobile money service across several markets[4].

This stands in contrast to payment card network interoperability, as exemplified globally by the Visa and MasterCard platforms. For example, a consumer with a bank card from Nigeria can, within seconds and with full confidence, pay a POS-enabled merchant located in Colombia, as long as both the consumer and merchant are using the same payment network.

The banking sector, too, offers interoperability for its customers, both domestically and internationally. Most domestic banks are connected to a local platform, either owned by banks or a government entity (usually a Central Bank) that processes account-to-account funds transfers, and to the SWIFT network for international funds transfers. Separate domestic and international networks exist to enable ATM interoperability for cash withdrawals.

The definition of mobile money interoperability is further broadened not only to include interactions among mobile money providers, but across to the traditional banking and payment systems. This is starting to occur: for example, Zuum, a Brazilian joint venture between MasterCard and Vivo, an MNO, offers both a mobile money service and a prepaid card tied to the same account. Both Western Union and Moneygram, two prominent money transfer companies, have signed deals with MNOs to enable remittances directly to a recipient's mobile money account rather than in cash.

Benefits and Challenges of Mobile Money Interoperability

There are two main benefits of mobile money interoperability. The first is greater relevance and thus satisfaction for customers and merchants: permitting a customer to send money to another regardless of the recipient's platform, enabling the same agent to use a single platform to manage various cash-in or cash-out products, or creating a seamless transfer experience between a customer's bank savings account and a MNO prepaid account. This, in turn, leads to the second benefit: greater transaction volume and revenue for providers. There is ample evidence from past interoperability schemes in banking and payments—and indeed in telecommunication sector (voice, SMS)—to strongly indicate that enabling interoperability is of mutual benefit to providers. The hope is that with greater transaction volumes and interoperability, MNOs and other actors would broaden their suite of financial products and reach more underserved populations.

[3] Some markets offer the ability for an individual to send money to a customer belonging to another MNO, but the funds are to be withdrawn in cash rather than automatically deposited as mobile money in the recipient's prepaid account.

[4] For more perspectives on interoperability, see CGAP's presentation at http://www.slideshare.net/CGAP/interoperability-and-related-issues-in-branchless-banking-a-framework-december-2011 and the GSMA's report at http://www.gsma.com/mobilefordevelopment/new-publication-a2a-interoperability-making-mobile-money-schemes-interoperable

If the advantages are so apparent, it is fair to ask why interoperability has so far not taken shape. The most apparent obstacle is technological: unlike payments, for example, which has a globally accepted standard (ISO 8583), there is no standard to process mobile money transactions[5]. Consequentially, a platform, whether built in-house or provided by a vendor, would not be able to easily communicate with another, which makes technological integration difficult.

The more challenging issue, however, is organizational: it is rare for competitors to come together, let alone come to agreement, on initiatives where there remains space for one member to outperform the rest (as a case in point, ATM interoperability among all banks in the US took nearly 15 years, though it started with a concerted effort of a few). This challenge in particular is one where public sector actors, from development agencies and foundations to non-profits and governments, could take a strong, "neutral" role by bringing together providers, proposing guidelines and conditions for interoperability, and, where appropriate, providing incentives to catalyze the development and launch of interoperable mobile money services.

[5] Mobile commerce standards are starting to be developed by the ISO (see www.iso.org/iso/home/news_index/news_archive/news.htm?refid=Ref1535)