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# In the Fast Lane: Innovations in Digital Finance

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# In the Fast Lane: INNOVATIONS IN DIGITAL FINANCE

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# Introduction

Sub-Saharan Africa (SSA) poses many challenges to financial inclusion: basic infrastructure is relatively underdeveloped, populations are still very rural and therefore widely dispersed, and a large proportion of the population (48.5%) lives below the international poverty line of \$1.25 per day.<sup>1</sup> As a result, it is estimated that only 17.5% of adults across the continent have access to an account at a formal financial institution.<sup>2</sup> And yet, poor families receive wages, run businesses, and purchase goods and services, and therefore have a need for basic financial services that help to manage economic decisions and risk. Excluded from formal finance, unbanked individuals resort to informal mechanisms such as savings groups, moneylenders, or social support networks in lieu of banking and risk management products. These informal mechanisms are imperfect and can be costly and risky substitutes. The primary obstacle to offering formal financial products to low-income customers has generally been the cost of delivery, given the relatively small transaction sizes involved. Although financial products for the poor have existed for decades in the form of microfinance, the inability to deliver these products cost-effectively has made it difficult for microfinance institutions (MFIs) to reach significant scale, particularly in SSA, where population densities remain relatively low.

Over the last few years, however, certain parts of Africa have experienced remarkable advances in financial inclusion using *digital financial services*<sup>3</sup>, which leverage information and communication technology and agent networks as a cost-efficient distribution channel. These innovations have had a profound impact on financial inclusion in markets where they have taken root, and appear to leapfrog traditional banking and microfinance infrastructure as a means of delivering financial services to the poor. A FinScope study conducted in Tanzania in 2013 found that

between 2009 and 2013, the proportion of Tanzanian adults who were completely excluded from the financial system declined from 55% to 27%, with the proportion of adults using non-bank formal financial products rising from 7% to 44%. This had a measurable knock-on effect on access to bank accounts, with the proportion of people using formal bank products rising from 9% to 14% over the same period.<sup>4</sup> Data for Kenya show similar trends, with the proportion of adults using a bank account increasing from 13% to 29% between 2006 and 2013.<sup>5</sup> Clearly, mobile financial services are having an impact on access to formal financial services; in fact, in nine emerging markets – all in SSA – there are now more mobile money accounts than bank accounts.<sup>6</sup> As a region, SSA has 98 million<sup>7</sup> registered mobile money users, representing 48% of the global user base.

Over the last three to four years, successful mobile money operations have emerged in places like Tanzania, Zimbabwe, Uganda, Ghana, and Cote d'Ivoire, demonstrating that the Kenyan M-PESA experience was not a one-off and mobile money is here to stay. Although operators continue to struggle with challenges around distribution, liquidity management, product development, risk management, and fraud, the basic foundations for the industry have now been proven to work in multiple markets, based on the twin pillars of technology and distribution. Will the industry look exactly the same in 10 years' time? Almost certainly not. But the elements are beginning to be well understood and a clear basic business model is emerging. What is less well established are the possibilities for innovation once the foundation for mobile financial services is in place.

Why does innovation matter in digital financial services? Although its contributions to financial inclusion are increasingly well documented, this is an industry that is still in its infancy. It

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<sup>1</sup> World Bank, World Development Indicators, 2010.

<sup>2</sup> World Bank, Little Data Book on Financial Development, 2013.

<sup>3</sup> The terms "digital financial services" and "mobile financial services" are somewhat different in meaning: "digital financial services" is broader, encompassing electronic payments, including retail payments by card or mobile phone. "Mobile financial services" is restricted to phone-based payments, and is sometimes also referred to as "mobile money". Mobile payments are a large subset of digital financial services in the African context, where card payments are relatively small. As such, for the sake of simplicity (and given the increasing convergence between the two outlined in this paper), the two terms are used interchangeably throughout.

<sup>4</sup> FinScope Tanzania, 2013 report summary. FinMark Trust and Financial Sector Deepening Trust Tanzania.

<sup>5</sup> Alliance for Financial Inclusion presentation, "Where are Mobile Financial Services in Africa?", John Owens, 5 February 2014.

<sup>6</sup> Pénicaud, C. & Katakam, A. State of the Industry 2013: Mobile Financial Services for the Unbanked, GSMA MMU, 2014. The nine countries are Cameroon, the Democratic Republic of Congo, Gabon, Kenya, Madagascar, Tanzania, Uganda, Zambia, and Zimbabwe.

<sup>7</sup> Ibid.

has clearly had a disruptive effect on the financial services and payments industries in Africa, and there is growing convergence between the world of mobile network operators (MNOs), banks, MFIs, and payment services providers. These disparate entities are increasingly being tied together in an ecosystem that not only enables the participation of low-income people in the formal financial sector for the first time, but also provides business opportunities for international players and African companies alike, from agents in rural Kenya to technology start-ups in Nairobi or Silicon Valley. Many of the innovations described in this paper will potentially act as the “glue” that will bind this new ecosystem together and make it function efficiently and at sufficiently low cost to reach the mass market. For a fully integrated, inclusive financial system to emerge, many changes are required in regulation, technology, interoperability, product, and process. It will also require strategic rethinks of traditional business models, particularly in the banking sector. Innovation is driving those changes and the rapid evolution of the ecosystem is pointing to the possibilities that digital financial services offer. On the continent, Kenya and Tanzania are leading the way, but other markets are catching up and innovations originating in other parts of the world are rapidly being adopted in Africa.

Challenges remain in the current ecosystem, and many of the innovations we found are aimed at making the system function more efficiently. We have grouped these into three broad and interconnected categories, listed to the right here:

While we do not rule out the emergence of a completely new digital financial services ecosystem in the medium to long term, we believe the process will more likely be evolutionary and build on existing systems. Bit by bit the challenges will be chipped away and new solutions will emerge for consumers. The cast of

## Distribution

Maintaining and growing networks of ubiquitous, liquid and well-trained agents is a formidable challenge. Even in places like Kenya, still only a small proportion of transactions are made through digital means. Cash is still king: customer trust, platform integration, and interoperability issues stand in the way of replacing paper with virtual currency.

## Back-Office Provider Systems

Integration between mobile money systems is imperfect and hampered as much by business arrangements as by technological shortcomings. Beyond basic interconnection, there are still challenges with managing data from customers to providers and connecting data points in ways that benefit end-users. Many of the innovations we surveyed are focused on addressing these inefficiencies, and will help to improve the customer experience as well as facilitate a broader range of products and services available to consumers.

## Products

In mid-2013, 92.6% of mobile money transactions globally were either airtime purchases or person-to-person (P2P) transfers.<sup>8</sup> This shows that even where robust digital platforms are in place, the industry still has challenges going beyond transactional services and offering additional products such as savings, credit, and insurance. Many of the innovations surveyed in this paper leverage technology to offer a wider range of consumer products. Penetrating beyond the retail customer segment to digitize business-to-business (B2B) value chains remains particularly difficult, but it is beginning to be tackled.

<sup>8</sup> Pénicaud, C. & Katakam, A. State of the Industry 2013: Mobile Financial Services for the Unbanked, GSMA MMU, 2014.

characters may change, but many basic functions will remain the same – albeit perhaps managed in different ways. For example, as cash is increasingly kept in the system, the need for cash-in/cash-out agents may diminish. But a digital system will still require acceptance points for payments, and so agents may eventually evolve into merchants. And someone will still have to go out and acquire those merchants, just as today’s mobile money providers are acquiring agents. In short, the larger trend observed in many of the innovations cited here is a growing convergence between mobile money and traditional payment systems, which has important implications for many financial sector businesses.

The purpose of this paper is to describe trends in the growing number of innovations in the mobile money and digital payments space, and to understand how these simple systems are evolving to deliver a more effective and diverse portfolio of financial services. We have intentionally focused on innovations that have practical applications for financial inclusion in Africa. We do not pretend to have captured all innovation in digital financial services, and categorizations are not perfect, as many solutions meet multiple needs. Nor do we offer opinions on any given innovation or its chances of success. Our aim is simply to provide a snapshot of

the changes under way in the digital financial services industry in Africa today and to offer a glimpse of what these innovations may mean for mobile money on the continent in the coming decade.

The paper is structured as follows: Section 1 summarizes key innovation trends in the distribution of digital financial services, including solutions for customer registration and activation, and improvements in agent network management. Section 2 discusses back-office innovations enabling, first, the integration of mobile money systems with merchants, or with financial services providers (FSPs) other than the mobile money provider. Secondly, back-office innovations are identified in the area of data analytics – the leveraging of large datasets of customer and transaction information to score potential borrowers, or for business intelligence purposes. Lastly, Section 3 focuses on users of basic financial services and product innovations available to them. Innovation trends in financial products and applications (“apps”) for both individual consumers and agribusiness value chains are highlighted, including mobile micro-insurance, pension products and pay-as-you-go solutions for utility services. Reference to specific service providers is made throughout the paper. The final section summarizes and concludes the paper.

# 1. Distribution: The Missing Link

The lack of infrastructure is a key challenge in Africa, and distribution is often the missing link between innovation and impact. Even in countries with nearly ubiquitous agent networks, such as Kenya and Tanzania, distribution remains a principal challenge in the development of mobile money:

1. **Agent liquidity:** Agents in rural areas – where conventional financial infrastructure is virtually non-existent – often have trouble rebalancing their float, leaving many customers dissatisfied and diminishing trust in the service.
2. **Interoperability:** Mobile money solutions are usually not interoperable between providers. For instance, a Vodacom subscriber cannot easily send money to a Tigo subscriber, just as a mobile money agent providing services on behalf of both Vodacom and Tigo cannot rebalance between both wallets, locking in liquidity that could have been used to serve additional customers.
3. **Fraud and network downtime:** Rapid agent network growth has resulted in incidents of fraud and service downtime in some markets. For example, according to a report by MicroSave and the Bill & Melinda Gates Foundation,<sup>9</sup> a median of 10 transactions per day per agent is being denied due to service downtime in Uganda. Ugandan agents could increase their daily transactions by 33% if this issue was resolved.
4. **Trust:** Any failure in the system, including those mentioned above, leads to loss of customers' trust, which is generally difficult to repair.
5. **Slow account opening procedures:** In certain jurisdictions, onerous Know-Your-Customer (KYC) regulations delay account activation, which prevents users from transacting

immediately, or in the worst case discourages potential customers from registering for the service altogether.

In response to these shortcomings, FSPs have experimented with innovations and product solutions to improve customer registration and activation, and agent network challenges.

*Trend: Apps and tools to digitize and speed up the account opening process*

One of the most pressing distribution challenges providers face in acquiring an active customer base is the slow account opening procedure at the point of sale (agents or branches). Although improving, user activity rates remain low: only 30% of registered users globally conducted one or more transactions within the last 90 days, which is conventionally regarded as the minimum threshold to consider a user active. What has been found to be a determinant of user activity is whether users were able to transact immediately after registering. A recent study found that 49% of users that conducted their first transaction at registration remained active versus 39% of users who did not transact at registration.<sup>10</sup> Consequently, digitized and automated account opening procedures are expected to increase customer activity and retention, following the registration process. KYC regulations, in particular, mandate the collection of certain identification documents before an account is opened. Mobile money providers and specialized vendors have now developed mobile apps and tools to digitize and ease the client on-boarding process.

- Financial institutions such as Equity Bank, KCB and CIC Insurance Group in Kenya have developed tools in-house that provide a first step in the electronic collection of documentation of clients, which is later sent securely to a

<sup>9</sup> <http://helix-institute.com/data-and-insights/agent-network-accelerator-survey-%E2%80%93-uganda-country-report-2013-0>

<sup>10</sup> Note: According to data from one mobile money operator. <http://www.gsma.com/mobilefordevelopment/the-big-payoff-getting-customers-active-at-registration>

server. This speeds up customer registration on the system and allows for the reconciliation of documents that may have been lost in transit.

- FINO, a branchless banking provider in India, offers a full suite of biometric products for enrolment, storage, and verification of documents, with all back-end system elements to complete customer applications.

Mobile imaging is also being used to speed up registrations, authenticate users and transactions, and reduce fraud.

- Jumio, Mitek Systems, Card.io and Abbyy – all specialized vendors in optical character recognition, document capture, and processing – offer mobile imaging and dynamic data capture solutions globally. Jumio enables smartphone cameras and webcams held by agents or merchants to image identity documents (IDs) and credit cards for verification and payment. Jumio also recently expanded its identity verification tools by launching “Face Match”, a feature matching ID photos with an end-user’s face.<sup>11</sup>

### *Trend: Finger and voice biometrics as additional options for customer authentication*

Illiteracy is still a real barrier preventing people from engaging with technology-enabled financial services. For example, transactions that require personal identification number (PIN) authentication are troublesome for number-illiterate users. While finding a secure two-factor authentication mix appropriate for the target population is still a challenge, lower-cost finger and voice biometrics options are opening up the spectrum of solutions available.

- A range of specialized vendors (Nuance, VoiceTrust, InAuth, and VoicePay) sell voice biometric solutions globally to financial institutions to authenticate transactions and reduce fraud.

- Other companies offer fingerprint biometrics solutions for staff or agents authenticating customers: AuthenTec and Remote Harbor in the United States offer low-cost solutions globally for fingerprint identification on computers and mobile devices.

- Both the latest iPhone and Samsung cellphones feature a biometric fingerprint scanner used to unlock the device, and now to power payments. Samsung has recently partnered with Paypal to offer payment-by-finger.<sup>12</sup>

This new element risks dis-intermediating the MNO from the dedicated secure space, provided the user has access to a smartphone.

- An example is that of Tangaza Pesa, a money transfer system in Kenya that has been operating a successful business registering and authenticating customers using a fingerprint biometrics solution, obviating the need for an ID. Facilitated registration and user authentication has become one of Tangaza Pesa’s principal differentiating advantages: finger biometrics is high security and low cost, requiring no paperwork and providing the added convenience to customers of not having to remember a PIN. However, the interoperability of the fingerprint is still quite low in Africa, making it difficult for providers to offer its customers the convenience of transacting or withdrawing cash at a partner network. Furthermore, fingerprint readers require agents to be well trained at guiding clients in recording a readable fingerprint.

- Another example is UBL Bank in Pakistan, which recently announced it will partner with VoiceTrust to deliver voice biometrics solutions for authentication of its retail customers. Voice identification, like fingerprints, reduces the need for customers to remember PINs, passwords, and security questions. The voice solution will provide interactive voice response (IVR) authentication in both Urdu and English.<sup>13</sup>

<sup>11</sup> <http://techcrunch.com/2013/09/18/jumio-adds-facial-detection-to-its-web-mobile-identify-verification-service-netverify/>

<sup>12</sup> <http://www.technologyreview.com/news/525996/pay-with-your-fingerprint/>

<sup>13</sup> [www.voicetrust.com/news/ubl-selects-voicetrust-for-voice-biometrics/](http://www.voicetrust.com/news/ubl-selects-voicetrust-for-voice-biometrics/)

*Trend: Optimizing distribution – field-force management tools to track field staff, agents, and/or merchants*

Building, incentivizing and managing an agent network that results in a positive and consistent experience for customers is critical to building trust in the system. This entails selecting strong-performing agents to operate in strategic and convenient locations that receive ongoing training and business support. As agent networks grow in size and complexity, providing consistent business support to agents has become difficult. The Grameen Foundation's App Lab in Uganda, for example, identified the following gaps in the distribution value chain: "the head office needed transparency of their sales agent activities, the trade representative needed a mobile relationship management tool, and the agent needed more effective business support".<sup>14</sup> Models to logistically support field agents and network infrastructure are now emerging:

- Grameen Foundation's Uganda App Lab in partnership with Salesforce, an application developer, developed a mobile field force management tool (Taroworks), which was deployed throughout mobile operator MTN's sales force in Uganda, and has managed to increase the speed of mobile money registrations.<sup>15</sup> Tool capabilities include monitoring and evaluation, portfolio, transaction and performance tracking, and training delivery.
- Field marketing support agencies Afrikings and Top Image have introduced field management tools; Kenya's leading merchant acquirer Kopo Kopo has introduced merchant management tools. Even though no single organization has developed a complete set, the tools available are many times linked to a portal, which also tracks the logistics of agent applications, delivery, and performance. As an example of how effective these tools can be, in 2012, MTN in Cote D'Ivoire outsourced its distribution network management to Top Image, resulting in a 400% increase in agent profitability.<sup>16</sup> Top Image managed agent performance more closely with such tools, developed stronger agent recruitment requirements, and provided them with additional liquidity.

*Trend: Emergence of third-party agent aggregators offering provider-agnostic agent services*

In a competitive race for market share, MNOs in Africa have built closed-loop mobile money services with proprietary agent networks. Such systems don't bode well for customer convenience, as an Orange customer cannot cash out at an MTN agent, nor can a Tigo and Airtel agent tap into his Airtel wallet to serve a Tigo customer. In an effort to improve the customer experience and alleviate agent operations, "aggregators" are offering agency and payment services that serve clients of all mobile money deployments. These aggregators are solving problems of long queues and bringing agent services closer to home for users.

- Maxcom has aggregated agency and payment services of many FSPs in Tanzania and Rwanda, including Airtel, Tigo, Vodacom, and Sasatel. It also provides over-the-counter (OTC) payment services directly for government, and utility and pay-tv companies.<sup>17</sup> Selcom in Tanzania is similarly providing cash-out and bill payment solutions for mobile money providers and banks through a single device at Selcom agents.
- BeyondBranches in Nigeria has recently started to offer agent services to clients of banks and MNOs through an interesting business model. The start-up identifies and trains retailers to become agents equipped with an Internet-enabled mobile handset. Once they pass a quality-control test, agents are entitled to offer BeyondBranches branded services that include cash deposits into bank accounts and OTC bill pay transactions, including airtime. On the side, BeyondBranches plans to offer its agents a suite of small business services such as inventory management, store credit tracking, credit provider assessment, insurance purchase, and mobile-based advertising.<sup>18</sup> Such value-added services are designed to help agents manage day-to-day business and make them savvier mobile users, thereby increasing the quality of agent services and support clients receive.

<sup>14</sup> <http://www.microfinancegateway.org/p/site/m/template.rc/1.26.18774/>

<sup>15</sup> Ibid.

<sup>16</sup> Pénicaut, C. & Katakam, A. State of the Industry 2013: Mobile Financial Services for the Unbanked, GSMA MMU, 2014. Textbox 3: Mobile Money in Cote D'Ivoire: A Turnaround Story.

<sup>17</sup> <http://www.humanipo.com/news/6814/tanzania-based-maxcom-africa-to-make-inroads-in-kenya-uganda/>

<sup>18</sup> <http://www.beyondbranches.com/index.php/news-room/agent-network-3-0>

## 2. Back-office Innovations: Connecting the Dots

Achieving higher rates of customer registration and activity by innovating on distribution challenges is not the only important aspect of attaining a successful mobile money business. In parallel, the business should crowd-in other businesses and FSPs so that e-payments are accepted in as many places as possible, driving up revenue for the mobile money provider and improving customer convenience. Challenges preventing mobile money from becoming the instrument of choice include:

1. Integration: Smaller financial institutions with low institutional capacity cannot integrate with mobile money systems in the absence of standard Application Programming Interfaces (API).
2. Merchant value proposition: Mobile money is still only being used for a minority of payments in SSA, primarily for remote payments and P2P transfers. Retailers and businesses still lack incentives to offer mobile money to their clients as a method of payment in-store or online.
3. Limited product offering: Mobile money providers for the most part offer purely transactional services to clients. In many cases, this transactional data are not being exploited to better understand customer segments or to design new products.

In response to these market gaps, several application developers and data analytics companies offering back-office services (such as integration, aggregation, and data analytics) to both FSPs and businesses have emerged.

### *Trend: Application developers supporting financial institutions with mobile money integration*

Mobile banking's principal value, vis-à-vis traditional mass-market models, is that it leverages customers' mobile phones as its distribution channel. Consequently, MNOs in partnership with financial institutions can offer mobile banking services most conveniently. In some cases, however, banks or MFIs remain the

sole lender, while using the MNO's services of mobile money payments merely as a low-cost payment platform. If the lender and the owner of the payment platform are separate institutions, the need arises to integrate their systems, allowing customers, for instance, to service their micro-loan with mobile money. Given the absence of standard APIs, integration is a daunting task for financial institutions, particularly for small MFIs with low institutional capacity. Some specialized IT firms and application developers, however, have connected the dots and spotted a business opportunity providing integration services.<sup>19</sup>

- Tangazoletu, a software company in Kenya, developed an application called Spotcash that allows clients of Savings and Credit Cooperatives (SACCOs) and MFIs to deposit and withdraw cash to and from their savings account by sending an SMS to the financial institution. The money is then transferred to or from the client's M-PESA mobile money account.
- Cellulant and Coretec Systems in Kenya offer small financial institutions similar M-PESA integration services.
- For financial institutions seeking MNO-independent solutions for mobile banking, F-Road in China offers a service that enables even basic feature phones to benefit from high security and functionality. F-Road uses a SIM overlay technology – a paper-thin sheet with an embedded chip – that connects with the SIM card but does not require collaboration with an MNO. Touch points built into the overlay filter information between the two layers. The hardware provides a means to store and carry program logic independent of the SIM, allowing F-Road partner banks to provide a SIM-neutral solution to their clients, while at the same time minimizing communications costs driving mobile banking functionality for customers.<sup>20</sup>

For companies seeking to outsource their branchless banking operations, Tyme in South Africa offers bespoke end-to-end services across the value chain on a hosted basis. Services include

<sup>19</sup> For more details on these integrators, please refer to "An Emerging Platform: From Money Transfer System to Mobile Money Ecosystem". <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/ssrnid1830704.pdf>

<sup>20</sup> <http://www.cgap.org/blog/china-%E2%80%93-future-leader-branchless-banking-poor>

User Centric Design (business models, processes, and products), Hosted Solutions (cloud-hosted technology, integration of different payment and loyalty products, core banking, merchant and retailer interfaces, and KYC solutions), and Branchless Operations (field marketing, activation and support, back office functions, communications, and data). Tyme currently hosts and operates mobile money services for MTN in South Africa and is also providing hosted services for EBank in Namibia, which is expected to launch during 2014.

*Trend: Technology companies enabling merchant acceptance of digital payments in-store*

Despite high mobile money user penetration in countries such as Kenya and Tanzania, e-money is still only used for a small minority of payments (as opposed to P2P transfers or airtime top-up). For proximity (as opposed to remote) payments, cash continues to dominate. Some entrepreneurs have connected the dots and offer brick-and-mortar merchants a chance to accept mobile money for payments in-store, on behalf of mobile money providers.

- In 2010, Safaricom had only 100 formal merchant accounts signed up under the M-PESA service in Kenya. They enabled a start-up called Kopo Kopo, along with two other companies, to acquire merchants on the Safaricom system. Merchants who sign up with Kopo Kopo receive a new SIM card that works on any phone, allowing it to work as a simple point-of-sale (POS) device. The company then aggregates all M-PESA payments from customers into a single account. In addition, cash flow summaries are displayed on a dashboard in the merchants' online accounts, summarizing information on customers and daily sales in a readily accessible format, practically eliminating all back-office work for the merchant. For its services, Kopo Kopo charges the merchant a 1% flat rate of the value of every transaction. This is a more attractive proposition to the merchant compared to the 3% to 5% charge<sup>21</sup> most credit card companies levy on payments,

but not necessarily entirely convincing yet for merchants operating and accustomed to cash-heavy environments (or merchants who are M-PESA mobile money agents and receive a payment to perform a cash-out transaction). Despite the dominant agent economics in Kenya, by November 2013, Kopo Kopo had around 10,000 merchants on its platform and was adding 1,500 new ones a month.<sup>22</sup>

- Vastech in Tanzania offers its merchants transaction validation, branded text message notification, and flexible fund settlement in a mobile wallet or bank account at a 1% transaction value charge. The added benefits these services offer (added analytics, efficiencies, security, and reduced fraud) will hopefully drive businesses and customers into using digital means of payment in-store.

Recently, MNOs have also started to acquire merchants directly. Safaricom is acquiring its own merchants to accept mobile money as a form of payment under the Lipa na M-PESA brand. Similarly, Telesom in Somaliland and Econet in Zimbabwe have cited developing merchant payments as a critical success factor in their business strategies.<sup>23</sup> Tigo in Tanzania is also experimenting with a merchant payments model.

Growing interest in mobile money merchant payments directly overlaps with the more traditional card business, and it is therefore relevant to highlight briefly a number of innovations taking place in the card space.

- A number of operators have developed low-cost POS devices for smartphones (mPOS), based on inexpensive dongles plus apps, including Square in the United States and Clip in Mexico. Other providers have developed inexpensive card readers that attach to the audio jack of smartphones or high-end feature phones. Some mPOS players have also built merchant aggregation (or payment facilitator) platforms, allowing them to reach further down the merchant channel.

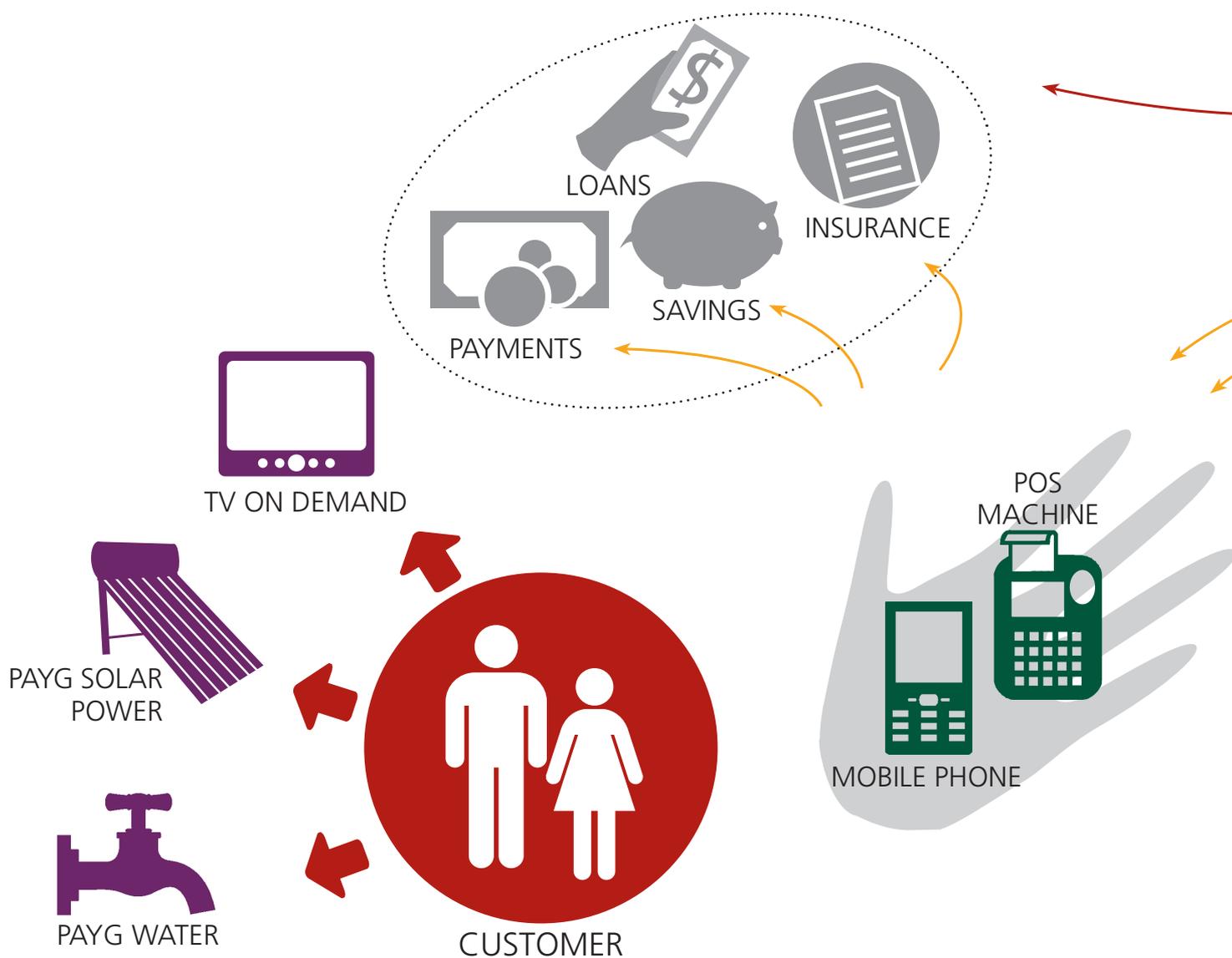
<sup>21</sup> Quoted on Kopo Kopo website. <http://www.kopokopo.co.ke/>

<sup>22</sup> <http://pando.com/2013/11/11/kopo-kopo-building-the-square-of-africa-amid-terrorism-monopolists-and-huge-opportunity/>

<sup>23</sup> <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/Telesom-Somaliland.pdf>  
<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/07/EcoCash-Zimbabwe.pdf>

# the future at hand

*innovation in digital financial services*



## PRODUCTS

Innovations leverage technology to offer a wider range of consumer products, like pay-as-you-go water distribution for example.



## DISTRIBUTION

## BACK OFFICE

Innovations and product solutions to improve customer registration and activation and agent network management, such as biometric identification.

Includes innovations leveraging alternative data sources, online and generated through the mobile money system, for business intelligence and development.

Infographic: Bonny Jennings [www.itltdesign.co.za](http://www.itltdesign.co.za)

- Near field communication (NFC) enabled devices make it easy to take payment with a simple wave of a card or phone with an embedded NFC chip or NFC sticker. Jib Technologies have developed an NFC sticker that can be attached to the back of the phone for payment. The shop's accepting device needs to have the same local radio capability, either into a traditional POS terminal or into a smartphone or tablet.
- A number of POS devices are offering additional business solutions and value-adds. Zoop (in Brazil and the United States) offers a pocket-sized bluetooth mPOS device that accepts chip and PIN, magstripe, and NFC/contactless cards and phones. In addition, the company offers integrated services including sales data tracking, contact management, real-time inventory management, staff time-keeping, and a dashboard with analytics. iZettle (in Brazil and Europe) offers a free app, a secure card reader, and analytics that help merchants keep track of their business. Ezetap (India) accepts card payments through a mobile phone or tablet and an Ezetap card reader and application for transactions under \$50. The service also includes daily settlement, paperless reconciliation, and online records.

It should also be noted that the traditional card players, MasterCard and Visa, are introducing new products and functionalities to complement their traditional business models to accommodate growing demand for merchant services in Africa. Initial experiments with virtual card overlays on mobile wallets in 2011 have given way to new products aimed at the mass market. Visa has launched two initiatives: mVisa, an interoperable mobile money solution in Rwanda, and Visa Mobile Payments (VMP) in Botswana, which provides Visa payment functionality for holders of Orange Money mobile wallets through a linked Visa pre-paid card. MasterCard is exploring similar mass-market products by developing a national ID with payment functionality in Nigeria and launching the Phone Cash mobile wallet in partnership with NBE Bank in Egypt. The wallet is a downloadable payments app that is MNO-neutral and can be linked to a MasterCard credit card.

Without low-cost, interoperable payment solutions – involving cards, phones, or both – the capacity of mobile money or cards to evolve into a ubiquitous payment instrument in-store in Africa will remain limited. In some markets, such as Nigeria and Ghana, regulators are trying to build interoperability into mobile money systems from their inception. In others, for example Tanzania and Indonesia, industry is coming together to try to develop scheme rules for interoperability. In other instances, technology solutions are being developed that enable interconnectivity in mobile money systems.

### *Trend: Payment aggregators enabling online payments and e-commerce*

Payment aggregators are enabling businesses to accept payments online, using mobile money or cards at “multiple payment gateways”. On these payment websites, users have available a one-stop-shop to make routine payments such as school tuition, utility bills, and mobile airtime, or to shop for goods. For businesses, payments received from customers using different payment methods are aggregated into a single account. Historically a common service for card aggregation, these services are now being extended to include mobile money as a means of payment.<sup>24</sup>

- Pesapal is one of the best-known payment gateways, currently aggregating 11 payment options for 12,000 schools and 10,000 businesses all over East Africa.<sup>25</sup> Consumers can make web and mobile payments for bills, school fees, tickets, airtime, and shopping for a small percentage of the transaction amount. Merchants pay Pesapal 3.5% per transaction value on average.<sup>26</sup>
- 3G Direct Pay focuses on aggregation solutions for hundreds of travel-related businesses in East Africa and Southern Africa. It recently announced<sup>27</sup> a partnership with Kopo Kopo to enable merchants to accept mobile money both in-store and online.
- iPay Africa enables businesses to accept multiple digital payments, both online and in-store.

<sup>24</sup> Note: For a review of the different payment modalities for online purchases through the mobile, please see Ignacio Mas and Mireya Almazan's "Product Innovation on Mobile Money": [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1707704](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1707704).

<sup>25</sup> <http://blog.pesapal.com/pesapal-payment-options/>

<sup>26</sup> This can reduce to 2.7% depending on monthly volumes. For ticket sales, the merchant cost per transaction is 5%, reducible to 4% depending on monthly volumes.

<sup>27</sup> <http://www.3gdirectpay.com/blog/partnership-between-3gdirectpay-and-kopokopo/>

### *Trend: Leveraging alternative data sources for credit decisions*

In today's "Big Data" world, data analytics providers harness advances in computation power and the ever-growing availability of data to innovate and solve complex business problems in a wide range of areas. Online and mobile banking are poised to benefit in particular from improvements in data analytics, as the identity and consumption behavior of users are instantly digitized and transmitted to service providers.

Data are being analyzed for an array of purposes in digital financial services, including to prevent fraud and to improve decision-making in almost every part of the business. But lately, alternative data analytics has been making headlines for its promising potential to revolutionize loan underwriting. In Africa and in other parts of the developing world, the poor usually cannot be assessed properly by lending institutions to measure repayment risk. Credit bureaus either do not exist, or hold very limited information on individuals.

In the absence of information on creditworthiness, microfinance has experimented with several models to manage default risk. In group-lending models, for instance, peer pressure effectively acts as loan collateral, but requires a close net of social ties *ex ante*, usually found in small villages, and is therefore not suitable to scale. In individual lending models, loan officers interact heavily with prospective clients, driving up the production cost of loan underwriting and concomitantly higher interest rates.

Mobile phone customers leave digital footprints every day, with every transaction: airtime purchase and usage patterns, SMS messaging patterns, and mobile money transactions. When combined with information gathered directly from the borrower such as income and marital status, data analytics companies gauge the creditworthiness of potential clients and estimate loan amounts that can be extended to them.

- Cignifi (in Brazil, Ghana, Mexico, and Chile) and First Access (in Tanzania) offer FSPs customer targeting and credit scoring services for a fee, using patented algorithms and models.
- Experian Microanalytics (international) is providing full loan cycle management for FSPs, including loan origination, underwriting, and servicing.
- Mobile Decisioning (MODE, in Kenya) advances airtime to customers on behalf of the MNO, using prior airtime purchase and usage as credit variables, and assumes the risk of airtime repayment.
- Tiixa (in Latin America and Southeast Asia) offers emergency credit and airtime advances for pre-paid cell phone users, also using airtime usage and purchase patterns as credit variables.

Other mobile money providers have built data analytics capabilities in-house.

- Safaricom and Commercial Bank of Africa in Kenya score M-PESA users wanting to access the M-Shwari loan product. As of 2014, the M-Shwari product had extended \$92 million in loans, with a 3.1% default rate, 1.9% lower than the 5% Kenya average.<sup>28</sup>

In summary, mobile money providers have three options at their disposal when leveraging mobile data for credit scoring: purchase analytics services from an external vendor, purchase analytics together with full loan cycle management ("managed service"), or build analytics capabilities in house.

As an alternative source of data to mobile transactions, some startups have developed mobile apps to support businesses or individuals with financial management decisions, thereby generating data later used for credit scoring.

<sup>28</sup> <http://www.itwebafrica.com/mobile/309-kenya/232389-140000-default-on-kenyas-m-shwari-loans>, and <http://www.theeastafrican.co.ke/business/Hard-times-for-banks-as-NPLs-rise--growth-slows--/2560/2226814/-/usqkdjz/-/index.html>, citing Central Bank of Kenya data as of December 2013. Five percent system non-performing loans reported on Central Bank of Kenya website from March 2013.

- InVenture in India developed an accounting tool called Insight, which helps businesses and households track daily revenue and expenses via SMS.

- In Kenya, the same tool is being tested with MFI Musoni clients, in an effort to obtain additional data points for credit scoring.

With the advent of Facebook and other social media sites, lenders are mining social media data to determine borrower identity and creditworthiness.

- In the Philippines, and now in Mexico and Colombia, Lenddo uses social media sources such as Twitter and Facebook to determine borrower creditworthiness and extend loans online.

- LendUp in the US attempts to gauge social network strength of prospective customers by looking at the characteristics of their relationships online and using that to make inferences about social collateral and, by extension, creditworthiness.

Even though Facebook users in Sub-Saharan Africa are half the number of mobile money users,<sup>29</sup> services such as Whatsapp are increasingly gaining traction.

Targeting a more middle-income demographic, a large number of online lending platforms across developed and emerging markets are already making use of alternative data sources as inputs in their loan decisions. Examples in this category include Wonga in the UK and South Africa, and Kreditech and Kabbage in the US.

Yet another innovation to score prospective clients is psychometric tests. Loan applicants are asked to complete tests administered on a PC or tablet in the form of a questionnaire based on psychometric principles such as abilities, attitudes, beliefs, and character, which

is then used to produce a credit score. A company designing such a platform for FSPs is Entrepreneurial Finance Labs.

Furthermore, behavioral data company Revolution Credit offers FSPs online financial education videos and quizzes for its clients to take throughout the loan process, allowing the company to gauge which client would be a better risk profile.

### *Trend: Leveraging alternative data sources for business intelligence*

Obviously, analyzing mobile money transaction data can have an even broader use for MNOs: identifying strong performing agents, understanding customer activation patterns, and improving marketing and services.<sup>30</sup> As a result, specialized companies have emerged that offer analytics services to MNOs and FSPs to better understand customers and improve efficiencies in distribution networks.

- Real Impact Analytics from Belgium offers mobile operators data mining tools with social network and mobility analytics, as well as sales and distribution analytics, to help operators improve their distribution network.<sup>31</sup>

A related application of sales transaction data is used in the fast-moving consumer goods (FMCG) industry.

- Scanntech, based in Uruguay, offers digital POS solutions to small retailers, allowing them to manage inventory and to record sales. Sales data (captured through a barcode scanner) is sold to FMCG companies such as Unilever and Pepsi, and used to determine promotion strategies. The device is offered to retailers for free, and Scanntech derives its revenue from on-selling the data. In the future, such sales data could also be used for FSPs to credit score prospective clients and extend working-capital loans to small businesses.

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<sup>29</sup> Pénicaud, C. & Katakam, A. State of the Industry 2013: Mobile Financial Services for the Unbanked, GSMA MMU, 2014.

## 3. Product Innovation: Reaping the Benefits of Robust Infrastructure

Most product innovation in mobile financial services in Africa has come from markets that have already reached scale, such as Kenya or Tanzania. Mobile money deployments in these countries share several characteristics: a widespread agent network that rewards well-performing agents and a mobile wallet proposition that emphasizes customer care and customer education. New products offered today in Kenya and Tanzania include on-demand loans, pay-as-you-go models for utility service consumption, and mobile micro-insurance.

Yet, product diversity at a global level leaves much to be desired: 74.8% of mobile money transactions globally are airtime purchases and 17.8% are P2P money transfers.<sup>32</sup> A precondition for product development and innovation is a well-managed agent network and a habituated customer base, since a strong mobile money payment infrastructure will crowd-in other service providers. This includes, first, financial services that can be delivered more easily via the mobile channel by MFIs, banks, and the MNOs themselves. Secondly, institutions such as government agencies, utility service companies, schools, and merchants can leverage the low-cost payment channel to distribute payments (in the case of government) or to collect payment for their services. Finally, third-party application developers will help with data analytics, integration management, and application development to facilitate and accelerate the delivery of these services.

Unfortunately, there are a number of barriers preventing further innovation in products.<sup>33</sup>

1. Inadequate APIs: Mobile money providers operate closed-loop systems without adequate APIs, preventing others from experimenting with additional product offerings and apps.
2. Regulation: Regulations also inhibit smaller non-bank players from building credible mobile money offerings that would create a more competitive marketplace conducive to greater product innovation.

3. Budget limitations: Mobile money divisions within MNOs operate on small budgets and have pressure to deliver results within short periods of time. This lack of flexibility leaves little room for the necessary experimentation that usually results in product innovation.

Regardless of these innovation barriers, FSPs have launched new products for low-income consumers and increasingly for the agribusiness sector. A next step in the evolution of the mobile money industry will be penetrating into other B2B ecosystems and value chains.

### Product Innovation for Consumers

*Trend: Pay-as-you-go for essential goods and services leveraging mobile payments infrastructure and machine-to-machine connectivity*

As of 2011, 51% of the rural population in SSA had no access to clean drinking water. Some 88% had no access to the energy grid.<sup>34</sup> New business models have now emerged that leverage both the existing mobile payments infrastructure and the cost decrease of machine-to-machine (M2M) solutions to provide essential services such as energy and water in an affordable and sustainable manner.<sup>35</sup> More specifically, “pay-as-you-go” solutions have been developed whereby consumers pay for essential services in small increments through mobile money: a portion of the device is down-paid at purchase and the balance is paid through small increments remotely via mobile money (lease-to-own). Using mobile money for micro-payments thus remedies the problem of revenue collection for off-grid energy delivery.

Furthermore, the M2M technology also allows retailers to mitigate the risk of fraud or theft: solar home systems or water pumps serviced by these companies have embedded micro-controllers that allow for remote operation and monitoring through

<sup>30</sup> For details, please refer to CGAP's work on customer data analytics with five providers: <http://www.cgap.org/blog/mobile-money-even-data-analytics-has-limitations>

<sup>31</sup> For an example, please see: <http://www.cgap.org/blog/can-voice-corridors-be-used-predict-mobile-money-hotspots>

<sup>32</sup> Pénicaud, C. & Katakam, A. State of the Industry 2013: Mobile Financial Services for the Unbanked, GSMA MMU, 2014.

<sup>33</sup> <http://www.ignaciomas.com/announcements/introducingacatalogofproductfunctionalitiesandinnovationsinmobilemoney>

<sup>34</sup> GSMA, IEA, World Bank. Obtained from GSMA's "Sustainable Energy and Water Access through M2M Connectivity", 2012. <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/Sustainable-Energy-and-Water-Access-through-M2M-Connectivity.pdf>

<sup>35</sup> For more information, see GSMA's "Sustainable Energy and Water Access through M2M Connectivity", 2012.

GSM/GPRS connectivity. In addition to preventing fraud, the technology also facilitates data collection of user consumption and tracks potential operational problems remotely. As of year-end 2013, CGAP had identified 28 companies offering off-grid energy solutions of which 23 are based in Africa. In addition, CGAP identified 15 water turnkey solutions of which nine are based in Africa.<sup>36</sup>

- M-KOPA in Kenya and Angaza Design in Tanzania sell solar equipment varying from basic solar lanterns to more sophisticated solar home systems that have the capacity to power larger household items such as a TV or a fan. Both companies are now expanding into other African markets. The devices sold by M-KOPA are GSM/GPRS enabled, while others such as Angaza Design use Frequency Shift Keying (FSK)<sup>37</sup>, bypassing the need to install a costly chip in the device sold by MNOs. The disadvantage of the FSK model is that the provider does not have complete control of the device, as connectivity requires the customer to open the communication channel. Regardless of the model, MNOs stand to benefit substantially from such solutions by an increase in average revenue per user (ARPU) of 10% to 14%.<sup>38</sup>
- Clean water service companies such as Grundfos Lifelink in Kenya and Sarvajal in India supply, install, and service turnkey water solutions for communities. They leverage low-cost GSM/GPRS-enabled water meters whereby communities can pay as they go for water through smart cards or RFID key fobs that can be recharged with mobile money (in the case of Grundfos). The embedded smart technology enables remote monitoring and control of filtration operations, while capturing operational data. Mobile-enabled access to drinking water has also facilitated leak and theft detection, improved monitoring, and increased water pump resilience.<sup>39</sup> Depending on the business model, people pay as little as \$0.001 per liter of purified water in Kenya and \$0.003 per liter in India.

Pay-as-you-go models have also gained traction in other sectors such as in health, education, and even in cable TV services. According to the GSMA, there are around 250 m-Health services currently in operation across SSA, some of which use mobile money for payments.<sup>40</sup> Similarly, in education, Kytabu in Kenya is offering a textbook subscription service allowing customers to buy or rent pages or chapters of books that can be downloaded onto mobile devices with micro-installments.

### *Trend: Mobile on-demand micro-credit is in demand*

As explained earlier, traditional microfinance models are either very costly to produce, or difficult to deliver in remote places. Mobile money is beginning to shift the center of gravity for the delivery of financial services in some markets.

- No other micro-credit and -savings product has had as high user uptake as M-Shwari in Kenya. Leveraging the M-PESA brand, M-Shwari offers users an interest-bearing account with the possibility to access 30-day loans in real-time. The product accumulates \$2.35 million in daily savings from about 6 million users, and extends 30,000 loans on an average day, with an average loan size of around \$10<sup>41</sup>. The high user uptake in only one year's time is a strong indication of the significant demand for short-term, paperless, real-time credit in Kenya. Other MFS providers in Africa are now following suit, trying to emulate the M-Shwari service. M-Shwari's biggest innovation is its seamless on-boarding process. Loans are approved in real-time based on credit-scoring models evaluating mobile transaction data of the user. No formal paperwork or interaction with a bank representative is required. When the loan is approved, the funds are immediately available on the user's M-PESA account. Significantly, the user's M-PESA account serves as collateral against non-payment.
- A related, on-demand micro-credit product has been launched by MTN in conjunction with MFS Africa for formally salaried workers. KwikAdvance, a cash-advance product launched in

<sup>36</sup> <http://www.cgap.org/topics/digital-finance-plus>

<sup>37</sup> The customer sends the mobile payment and immediately receives a phone call from the operator who plays a "tone" back to the customer who holds the phone up to the system (for transmission). The device then releases another tone that is transmitted through the phone to the operator with information on energy consumption.

<sup>38</sup> GSMA's "Sustainable Energy and Water Access through M2M Connectivity", 2012.

<sup>39</sup> A full list of impact to water providers, consumers and MNOs is provided in GSMA's Sustainable Energy and Water Access through M2M Connectivity. <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/Sustainable-Energy-and-Water-Access-through-M2M-Connectivity.pdf>

<sup>40</sup> <http://www.gsma.com/newsroom/sub-saharan-africa-leads-world/>

<sup>41</sup> <http://www.itwebafrica.com/mobile/309-kenya/232389-140000-default-on-kenyas-m-shwari-loans>

Ghana, Cameroon, and Liberia, allows MTN mobile money users to access 40% of their net salary before the end of the month. Users then receive the proceeds in their mobile money account within one minute.

### *Trend: Mobile micro-insurance making its way into poor African households*

Perhaps the most challenging financial product to explain and sell to the poor is that of insurance: a buyer of insurance pays periodic premiums to a provider, with no tangible assurance that he or she will ever see the money again. Despite this, insurance providers have continued to innovate to deliver insurance services to a low-income demographic. CGAP counted 84 live mobile micro-insurance products as of August 2013, 54% of which were found in SSA.<sup>42</sup> Some 76% of these products offer life insurance, while the rest offer some variation of health, accident, cattle, crop, and travel insurance. The simplicity of a life insurance product in terms of sales and claims administration processes makes it perhaps the most suitable product to market through the mobile phone.

Interestingly, micro-insurance products were originally pushed by insurance companies looking to penetrate new customer segments. Nowadays, non-insurance entities such as MNOs seem to be playing a more important role in the development of the product, beyond simply providing the delivery channel.

- Airtel uniMobile (Ghana), TNM Moyo Cover (Malawi), and YuMobile yuCover (Kenya), in partnership with specialized micro-insurance B2B service providers such as Microensure and Bima, are offering life insurance coverage free of charge (no premium) to customers meeting minimum transaction or airtime balance requirements, thereby seeking active customer loyalty.
- Other MNOs (Tigo Family Care in Ghana and Vodacom Faraja in Tanzania) have innovated a bit further, offering a so-called “freemium” model whereby the user gets basic insurance free of charge, but can choose to double the

coverage, or extend the coverage to an additional family member, for a small monthly premium. Premiums are paid either with airtime (46%) or mobile money (54%).<sup>43</sup>

- Cooperative insurance companies M-Bima (life insurance) and Linda Jamii (health insurance) in Kenya offer micro-insurance products for a regular premium payable through mobile money. Even though operational only since 2013, Linda Jamii has already signed up 100,000 customers.

### *Trend: Formal products building on or leveraging observed informal behaviors and group capabilities*

Unbanked people in Africa and other parts of the developing world usually rely on informal financial practices that protect them against risk rather than accessing formal financial services. How can informal financial practices be translated into formal product features that appeal to the unbanked? A few different models are taking the experience of informal savings groups (Tandas, Roscas, and Chamas) online to broaden the reach of users, improve convenience and quality, and reduce cost.

- Emoneypool and Yattos in the United States provide an online platform for savings circles – groups of people saving together, taking turns to access the collective savings and leveraging the existence of online social networks.
- In Kenya, Bank of Africa and Safaricom are launching a mobile platform for Savings Loan Group management called M-Chama.

In developing countries, the poor will generally turn to family and social networks in times of need. Microfinance has leveraged this informal asset as a form of collateral: loans are extended to social groups, using peer pressure for repayment.

- Lendo is leveraging social networks such as Facebook and Twitter for peer-to-peer vouching to extend loans online. Lendo also uses alternative data, such as social media, to more cheaply assess borrower creditworthiness. Such a model

<sup>42</sup> For additional details on mobile micro-insurance products, refer to CGAP’s “The Emerging Global Landscape of Mobile Microinsurance”, 2014, and GSMA’s “State of the Industry 2013: Mobile Money for the Unbanked”, 2014.

<sup>43</sup> Ibid. Note: Regulation in some countries does not allow for insurance to be paid with airtime, while lack of e-regulation in other countries prevents insurance from being paid with mobile money. <http://www.cgap.org/blog/designing-mobile-microinsurance-products-premium-payment-methods> and <http://www.microinsurancefacility.org/publications/mp26>

could be disruptive enough to achieve what traditional finance has not so far: broad reach at affordable interest rates.

- LendFriend in the United States allows borrowers to choose their loan terms and draft a pitch online to send to their social network to get funded.
- South Africa's Maana Mobile is leveraging people's social networks by supporting handshake loans, pawning, and group savings/lending management on feature or smart phones. Its apps give users direct access to their phone contact list, making it easy for users to include their social network for financial management. Maana is currently assisting small shops with their informal store credit management and utilizes the data to later extend working capital loans to these shops. When referring to group capabilities, interconnectedness is cutting out the need for a middle-man, and enabling crowd-sourcing as an innovative alternative business model for financial services (P2P lending, P2P invoice discounting, and P2P currency exchange) – all for a more affordable price. Online P2P lending platforms are connecting individual borrower and individual investors.
- Zidisha (Benin, Burkina Faso, Guinea, Kenya, Mali, Niger, and Senegal) offers P2P lending platforms managed by volunteers. The borrower and lender determine interest rates (and perform risk appraisal) bilaterally, without an intermediation service.
- Kubo Financiero (Mexico) also offers a P2P lending platform, but analyzes individual lender risks and sets interest rates used by the transacting parties.

Crowd-funded finance is in its early development stages and long-term success is still uncertain, but volumes are growing to significant levels, augmented by institutional funds. Lending Club, a leader in the United States market, has grown to over \$4 billion in loans, with over half sourced from individual lenders.<sup>44</sup> To gauge future prospects for this model, it will be important to monitor efforts of seasoned players as they go public and seek to expand their offerings to broader consumer credit offerings and

ultimately to mortgages. Whether this will remain a P2P network exchange or turn into a different sort of funding platform is still unclear, but volumes are significant enough to merit attention.

*Trend: Proliferation of financial products offered by non-mobile money providers riding on top of the mobile money platform.*

A nascent financial service is the emergence of micro-pension products, helping informal workers save for retirement.

- Mbao Pension Scheme members in Kenya deposit a voluntary minimum of 20 Kenyan shillings (\$0.30) per day using either M-PESA or Airtel mobile money through the PayBill feature (Mbao is slang for 20 Kenyan shillings in Kenya). With an 8.5 million informal worker addressable market in Kenya, products such as the Mbao Pension Scheme can make a big impact on financial inclusion. Like a regular pension plan, members benefit from tax advantages and investment income generated from investing the contributions. It is nevertheless important to highlight the payment costs associated with products that are not run by mobile money providers, but rather only use the payment channel. M-PESA for example, charges \$0.03 for an \$0.12 to \$0.57 mobile money transfer. If an Mbao pension member deposits 20 Kenyan shillings (\$0.30) daily from his M-PESA account, he is effectively paying a 15% surcharge on each payment.
- MFI Musoni in Kenya reduces loan distribution and collection costs by leveraging mobile money to operate virtually cashless, as all loan repayments and disbursements are made via M-PESA mobile money transfer. It operates five branches but none of them offer cash services. The branches are instead being used for customer service. Although not at the speed of M-Shwari, loans are currently being disbursed 72 hours after application. This is still an improved time frame when compared to traditional microfinance. Since May 2010, Musoni has disbursed 18,000 loans for a total of 500 million Kenyan shillings.<sup>45</sup>

<sup>44</sup> Stefanski, email exchange with Lending Club, 1 May 2014.

<sup>45</sup> For a case study, please see GSMA's "State of the Industry, 2013: Mobile Money for the Unbanked", text box 18.

### *Trend: Consumer financial education – innovations in financial capabilities and rewards-based strategies*

A financial product aimed at low-income populations may struggle to be successful absent a strategy to educate the customer on its use. Improving consumers' "financial capability"<sup>46</sup> has become an important strategy for bringing the unbanked into the formal financial system.

- Revolution Credit in the United States offers FSPs a set of online financial capability development programs in the form of videos and quizzes offered at different stages of the lending process – customer acquisition, underwriting, or account management and collections. Revolution Credit reports to have reduced delinquency rates on loans extended with such quizzes by 30%. Retention has been improved by over 67% by identifying better risk profiles across both thin-file and no-file customers.<sup>47</sup>

For borrowers, such services offer the opportunity to learn about financial management through engaging online videos. Some have likened Revolution Credit to a more enjoyable traffic school for credit, giving borrowers a second chance to access credit.<sup>48</sup> Importantly, the videos are designed specifically for the respective step in the lending process, rather than having the education completely separate from the product.

- Payperks in the United States uses illustrated education and sweepstakes-based rewards for holders of pre-paid cards. Financial institutions add Payperks as a feature on their products, such as pre-paid debit cards, to increase adoption, retention, desirable usage, customer self-service, and loyalty.

Prize-linked savings products or features that use behavioral economics principles to incentivize savings behavior by making the act of saving fun and rewarding are also emerging.

- MaMa accounts, launched by First National Bank in South Africa, reward savers with monthly prizes.
- In Colombia, Juntos Finanzas has partnered with financial institutions to make their SMS savings coach available to

clients to drive customer engagement and increase savings balances.

- An interesting text-based service, also designed to introduce savings discipline, is that of Piggymojo in the United States. When a user is tempted to buy something they could probably do without, he texts Piggymojo the dollar amount he wants to save and a short description of what he is not buying. The user can then visualize his savings at the end of the day.
- Save Up in the United States offers a reward program linked to financial and savings goals that employs gaming mechanics to induce desired behaviors.

Mobile app development challenges such as MyMobileApp-Challenge and the FinCapDevChallenge are innovating next-generation mobile tools using these ideas.

### **Product Innovation for Business: The Case of Agribusiness**

In the quest for scale, MFS providers are also attempting to go beyond the consumer segment and are looking to digitize B2B value chains. One example of such developments that is particularly relevant to SSA is the case of agribusiness. The agriculture industry accounts for 25% of Africa's GDP and 70% of employment.<sup>49</sup> Largely composed of small-scale farms, farmers are typically limited by lack of machinery and capacity, large information asymmetries (market prices and market access), and lack of financial safety nets. To this end, mobile technology has the potential to improve the information asymmetry gap throughout the agribusiness value chain, and provide farmers with low-cost, risk-mitigating financial services.

### *Trend: Pushing mobile payments from buyers to farmers for their produce*

FSPs are increasingly leveraging mobile technology in the delivery of agriculture financial services. Farmers have started to repay micro-loans using mobile money at financial institutions such

<sup>46</sup> The World Bank/OECD Russia Trust Fund defines financial capability as "The internal capacity to act in one's best financial interest, given socioeconomic and environmental conditions. It encompasses knowledge (literacy), attitudes, skills, and behavior of consumers with respect to understanding, selecting and using financial services, and the ability to access financial services that fit their needs".

<sup>47</sup> FinnovateFall 2013 Revolution Credit demo. <http://www.finnovate.com/fall13vid/revolutioncredit.html>

<sup>48</sup> [http://www.americanbanker.com/issues/178\\_232/behavioral-data-startup-combines-big-data-with-credit-traffic-school-1064039-1.html](http://www.americanbanker.com/issues/178_232/behavioral-data-startup-combines-big-data-with-credit-traffic-school-1064039-1.html)

<sup>49</sup> IFC, Agribusiness in Africa, [http://www.ifc.org/wps/wcm/connect/region\\_ext\\_content/regions/sub-saharan+afrika/investments/agribusiness](http://www.ifc.org/wps/wcm/connect/region_ext_content/regions/sub-saharan+afrika/investments/agribusiness)

as Musoni, Juhudi Kilimo, and One Acre Fund in Kenya, and Opportunity International Bank in Malawi.

Mobile money providers, large produce buyers, and implementing partners are jointly piloting several efforts to channel payments to farmers through mobile money.

- In Zimbabwe, produce-buyer KAITTE piloted the distribution of 448 farmer payments through Ecocash.<sup>50</sup>
- In Ghana, Agribusiness Systems International and major rice producer GADCO will pilot mobile payments to 500 rice farmers using Tigo Cash.<sup>51</sup>
- SmartMoney in Tanzania and Zoono in Zambia have also experimented with mobile payments, resulting in lowered cash-handling costs for suppliers, and in higher perceived payment security for farmers.<sup>52</sup>

Just like in other areas, mobile money in the agribusiness space will only gain real traction when a large part of the value chain transacts in e-currency, obviating the need to withdraw cash. Unfortunately, there is still a long-way to go from today's closed-loop and frequently subsidized pilots to the full digitization of agricultural value chains.

### *Trend: Index-based insurance dominating the agricultural micro-insurance space*

Mobile technology is also leveraged for micro-insurance products in the agriculture space.

- Kilimo Salama, offered in partnership between the Syngenta Foundation, UAP Insurance, and MNO Safaricom in Kenya, provides affordable index-based weather insurance for small farmers. Using automated weather stations to determine weather conditions, Kilimo Salama has set up a system that automatically triggers claim assessment and payouts based on weather data without the need for costly onsite claim verification. The cost of the service is further reduced by claims being paid out through mobile money. Now the most popular agricultural insurance program in Africa, Kilimo Salama had insured 187,000 farmers across Kenya and Rwanda by the end of 2013.<sup>53</sup>

Another interesting micro-insurance product in the agribusiness space leveraging weather and forage reading technology is that of index-based livestock insurance.

- APA Insurance, in partnership with Leapfrog, ILRI, and World Vision, have developed a micro-insurance product in Kenya that covers livestock in the event of drought and which uses mobile money for premium and claim payments. The product uses satellite readings to monitor when rain or forage falls below the required level, which would then trigger a claim payout.

### *Trend: Collective purchasing and selling in agribusiness made possible through mobile apps*

Given that the African agriculture sector is predominantly composed of small-sized firms, having a mechanism for farmers to group easily and collectively bargain for lower prices of inputs can be ground breaking. Farmer associations and cooperatives thus far have attempted to play this role, but mobile apps and mobile money payments hold the promise of a lower-cost, more convenient, and seamless experience.

- Application developer Virtual City has developed the Fertilizer App for small and medium farmers in Kenya. The app aggregates fertilizer orders sent in from farmers through SMS or Unstructured Supplementary Service Data (USSD)<sup>54</sup> from various regions, and specifies local drop-off points where farmers can pick up their fertilizer. This allows them to obtain better prices for their farm inputs.
- In Kenya, the app M-Farm offers an SMS and web-enabled platform linking farmers to farm input suppliers for collective purchasing and selling.

Additionally, smallholder farmers do not have readily available access to business-relevant, real-time information such as weather forecasts, market prices for inputs, or market prices for their produce. As a result, several foundations and development organizations have supported the development of mobile apps that can bridge this information gap and make this information mobile.

<sup>50</sup> <http://www.mercycorps.org/research-resources/case-study-lessons-buyers-experience-mobile-money>

<sup>51</sup> <http://www.asintl.org/our-experience-Ghana-Rice-Mobile-Finance-RiMFin.html>

<sup>52</sup> <https://communities.usaidallnet.gov/ictforag/node/362>

<sup>53</sup> <http://www.syngentafoundation.org/index.cfm?pageID=562>

<sup>54</sup> Unstructured Supplementary Service Data (USSD) is a protocol used by GSM cellular telephones to communicate with the service provider's computers. USSD can be used for WAP browsing, prepaid callback service, mobile money services, and location-based content services.

- App m-Farmer in Tanzania and Esoko in Ghana offer farmers information on weather forecasts and market prices, and provides agricultural tips and advice on dealing with pests and diseases.

Although these are interesting innovations with much potential, lessons from Mercy Corps' Agri-Fin Mobile Program suggest that disseminating agricultural information through mobile phones will not be easy. Radio and face-to-face consultations were still cited as farmers' primary sources of information, proving that their demand for information needs to be better understood.<sup>55</sup>

Looking beyond consumer and agribusiness product innovation, FSPs have already started looking at digitizing other B2B value chains (for example, FMCG companies and the intersection with retail stores). Although still in the early stages, a next wave of innovations is poised to come from this space.

## Conclusion

Mobile financial services have evolved rapidly in Africa since M-PESA was launched in 2007. Some "leapfrog markets" have made remarkable advances in delivering access to financial services for the mass market. Those countries that have built the basic infrastructure are now able to deliver a much larger range of goods and services over that new payments infrastructure. Other "aspiring markets" will need to focus on building the distribution rails for a number of years before they can do the same. Variation by country is driven by a multitude of factors, including mobile phone penetration, financial and conventional infrastructure development, population density, regulation, and the appetite of private players to pursue the opportunity. The good news is that the region no longer has to look to Kenya as the only example of successful mobile money on the continent.

The role of innovation is important in this process, as it will continue to stimulate improvement in the rapidly evolving mobile money ecosystem and provide new opportunities for those willing and able to seize them. Process innovation will make existing infrastructure work better for operators and consumers. It will lower the cost and reduce friction points in

delivering the service. It will also provide the data needed to supply a better service offering to consumers and, increasingly, to businesses. Product innovations will expand the range of services available to consumers, but will also increase the transactional traffic flowing through digital payment systems. This growth in transaction volumes will help bring costs down and make it increasingly possible to offer digital financial services to the base of the pyramid cost-effectively. As transaction volumes grow, distribution capabilities will expand and make it possible to deliver more to distant locations, as the cost for marginal investment reduces over time.

As markets take off, new entities enter the ecosystem and the network effect grows. Three years ago, African mobile money was delivered by MNOs, with a few rare but notable exceptions like Equity Bank in Kenya. Today, a number of banks are building large-scale mobile money operations, as are independent payment services providers. MFIs are also beginning to leverage the twin pillars of technology and distribution to extend their footprints. As these systems evolve, other businesses, some old and some new, will increasingly tap into the larger mobile money ecosystem to deliver to the market. One has only to visit Nairobi today to see the energy and ingenuity of Kenyan entrepreneurs hoping to meet the huge demand for goods and services that has been uncovered by that country's remarkable mobile money journey.

Traditional FSPs will need to adapt to rapidly changing events on the ground or they will find themselves left behind in increasingly niche market positions. As in other parts of the world, African consumers value convenience, security, and customer service, and are willing to pay for these attributes regardless of where they stand in the economic pyramid. Those who are alert to the opportunities in the mass market will benefit as economic growth increases the purchasing power of the growing African middle class. The mobile money landscape may look very different in ten years, but what seems beyond doubt is that we are at the starting point of a fundamental change in how financial services are delivered to the mass market in Africa, and innovation is helping to drive that change. In a global marketplace, innovations developed anywhere in the world can rapidly be adopted and shaped to local conditions, creating a virtuous cycle that will benefit consumers at all income levels. The mobile money story has been a remarkable one, but it has only just begun.

<sup>55</sup> <http://www.cgap.org/blog/series/understanding-demand-smallholder-financing>

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