
*Completed Research Paper*

**Dibia Victor**
City University of Hong Kong
dibia.victor@my.cityu.edu.hk

**Abstract**

In developing regions of the world such as Sub-Saharan Africa, access to basic financial services such as funds transfer and bill payments are unavailable to over 70% of the population. Mobile money technologies, which entail the use of mobile technology in facilitating financial transactions, have presented themselves as viable methods of reaching this segment of the population known as the unbanked. However, there is an unfortunate dearth of studies that examine the limitations of mobile money implementations and provide recommendations for improving this important tool for financial inclusion. To this end, this research provides a review of the evolution of mobile money technologies as an example of user centered innovation and identifies the important actors in the mobile money ecosystem. Through a case study of the performance of mobile money deployments in two regions of Africa (Kenya and Nigeria), critical success factors are identified and discussed. Specifically, it is highlighted that : a mobile first approach to designing the ecosystem, balanced regulatory policies, a useable base of distribution agents and alignment with the needs of the unbanked are four important factors for successful mobile money implementations in developing nations.

**Keywords**

Mobile money, user-centered Innovation, developing countries, ICT for development

**Introduction**

Payment solutions and banking services are a key infrastructural pillar of any society. In addition to the financial governance, advising and benefits they provide, they also greatly simplify the basic process of trade exchanges. Over the years, the concept of banking services has expanded beyond the traditional notion of established financial institutions such as banks, credit unions, mortgage companies, pension funds insurance firms, investment banks, to include a wide array of independent payment processing actors/institutions as well as those facilitated by technology. In developing nations of the world, a large percentage of the population have no access to conventional banking services due to infrastructure challenges and low literacy rates. According to a 2009 report by Mckinsey and Company (Alberto Chaia, 2009), 2.5 billion adults do not use financial services to transfer, save or borrow funds. In areas like Sub-Saharan Africa, as much as 80% of the population belong to this group referred to as the unbanked. Benefits of banking services such as macro and micro credit infrastructure, ease of money transfer and financial advisory remain largely unavailable to the unbanked, further contributing to the slow pace of development observed in these regions. This situation has inspired the need for alternative considerations towards providing financial services in such regions that address existing challenges. One technology that has achieved particular success especially in regions of Africa is the use of mobile money technologies. The term Mobile Money refers to the innovative application of mobile devices in providing financial
services to consumers (Stein, 2011). These services which are made available to banked and unbanked mobile subscribers include mobile payments, mobile transfers and in some cases, mobile banking. They will typically enable customers create a (virtual) mobile money account, deposit funds into this account, make transfers and withdraw cash value in a manner that is secure, easy and cheap. Mobile money represents a synergy of two industries that have erstwhile existed independently – mobile telecommunications and financial services. In most successful instantiations of mobile money deployments, both industries have leveraged on their individual competencies to both scale and deliver on financial service objectives. In this article my purpose and hence contribution is tripartite. First, I discuss the evolution of mobile money in developing countries as an example of the phenomena of user centered innovation. Next, I identify the major actors in the mobile money ecosystems stating their roles and interactions, exemplified by case examples. A final contribution is done through a discussion of emergent factors that drive the success of mobile money implementations as well as lessons or pitfalls that need to be avoided.

The rest of the paper is organized as follows: A discussion is provided on the user-centric evolution of mobile money followed by a description of the key actors in the mobile money ecosystems. The next section discusses factors that have contributed to the success of mobile money technologies, exemplified by the highly successful M-PESA case in Kenya and emerging mobile money deployments in Nigeria. The final section of this research paper concludes with a discussion of the key lessons that can be learned from these scenarios in designing future mobile payment solutions applicable to wider regions of the world.

A User-centric Evolution of Mobile Money

Users of any given product or service fundamentally differ from the manufacturers in that while they expect to extract economic benefit from using the product, the manufacturers amass benefit by selling the product. This difference in motivations (utilitarian benefit vs. profit benefit) position users as great sources of innovation for product improvement as well as new product development. (Thomke & Hippel, 2002) have described this paradigm where innovation flows from users to producers as user centered innovation, and argue that more often than not, users are the inadvertent creators of technology and the primary sources of innovation. This is evidenced by studies (Hippel V. , 1988) which discovered users were the developers of 80% of the most important scientific instrument innovations, and accounted for a significant portion of innovations in the semiconductor processing industry. Existing works also go ahead to identify an ilk of users’ called “lead users”, who actively contribute to the innovation process by modifying and creating products of their own (Hippel E. v., 1986) . These users are highly conversant with the target market state of the art and have a higher understanding of the important needs which appeal to other users in the same market. The impact of innovations created by these lead users have been known to outperform those suggested by randomly selected user groups (Lilien, Morrison, Searls, Sonnack, & Hippel, 2002) . Lead users have also been characterized as being ahead of the general marketplace in product adoption (early adopters) and stand to extract significant benefit from satisfying a need addressed by the focal product (Hippel E. v., 1986). As the phenomena of user centered innovation continues to gain traction, spurred by advances in computing and communication technologies, manufacturers are beginning to actively assimilate user innovations into their product development process. In some cases, user centered innovation has advanced beyond simple product improvement and pioneered entire new product development endeavors from manufacturers. On the other end of the innovation spectrum, is the kind of innovation that comes solely from manufacturers who harness available technology in developing products they perceive as a fit for market needs.

In Africa (and many developing countries of the world), it can be argued that the journey towards mobile money has followed a “customer centric” evolution path as opposed to a “technology centric” model of innovation observed in developed nations. In these regions, there has been a rapidly growing internet penetration rate and mobile cellular network access within the last decade, trends which have been
Successfully harnessed in addressing existing problems. About 90% (GSMA, November 2012) of the mobile customer base in Africa purchase prepaid card vouchers using cash, from retail outlets in order to top up their mobile device call credit. MNOs run their own retail outlets as well as license independent dealers authorized to sell mobile recharge vouchers to end customers. In 2008, it was a popular use case for students to request payment for services or gifts in form of recharge vouchers and even hold on to a collection of recharge vouchers as stored monetary value. It was also common to receive and gift recharge vouchers as birthday presents and use them for the fulfilment of a bevy of social obligations. Another use case that quickly became popular was the use of recharge vouchers as a medium to transfer value over huge geographical distances. Concerned consumers (lead users in this case) quickly discovered they could send “money” (recharge vouchers) to loved ones in remote villages simply by purchasing these vouchers and texting the digits via short message service (SMS) - at no extra expense. Their loved ones could either use the recharge vouchers themselves or exchange it for cash after finding an exchange partner in need. This provided value as it addressed several problems especially peculiar to the developing nations. First, it provided an expense-free method to exchange value for both the banked and unbanked. Next, it addressed issues related to infrastructure and transfer over wide geographic distances effectively enabling location free banking (Laukkanen & Lauronen, 2005). Furthermore, it was accessible to almost anyone and provided all of this with near instant confirmation – SMS message delivery. No alternative method of value exchange provided comparative qualities. Available options were either costly, risky or inaccessible. Consumers could either send value through risky mass transit systems (public/private transportation) or make expensive bank transfers. Even today, other factors such as sparse bank branch coverage, extended waiting times for transfers and infrastructure challenges (particularly power), still make bank transfers less desirable. Thus consumers, through innovative use cases, defined the basic structure for the most successful form of Mobile Money in the third world today. Observation of these innovative use cases by customers provided the initial validation but building Mobile Money infrastructures. This basic structure which involves consumers with mobile devices, voucher distribution agents and MNOs has been formalized and constitutes the basic components of Mobile Money deployments, generating value for all stakeholders along the chain. Models of mobile money implementations can further be categorized based on the party that leads its deployments initiative – MNO led, Bank led, Independent Third Party led, or Hybrid models. These parties leverage on existing capacities or forge new partnerships (e.g the hybrid model) required to build the ecosystem. In many parts of the developing world, mobile money remains the only way to provide financial services (transfers, remittances) to the unbanked and MNO-led strategies have proved to be the most successful (Gautam Ivatury, 2008).

**Actors in the Mobile Money Ecosystem**

Building on the user centric innovation paradigm earlier explained, the primary actors in the mobile money ecosystems in developing nations have evolved beyond Consumers, Distribution Agents and Mobile Network Operators (MNOs) to also include Technology Partners, Banks, Merchants and Regulatory Authorities (Tobin, 2011). Accordingly, the portfolio of services have also extended beyond primary money transfer to include stored value services, bill payment, salary payments, purchase prepaid airtime, etc. Low transaction fees (in the order of 0.01%) and a commission structure make the system even more attractive to customers as well as distribution agents. In order to scale elegantly and provide services to millions of customers, mobile money infrastructure providers need core information technology partners to deploy appropriate processing servers which they may build themselves or outsource to third parties. This includes software for processing service requests from mobile devices, logging transactions as well as providing optional automated integration with banks. Banks have an existing client base, distributed branches and existing relationships with clients positioning them as influential actors in a mobile money implementation. More importantly, as the mobile money transactions volume grows to include millions of transactions per day, the key value proposition of banks...
that come to fore, is their vast experience in dealing with money. In Figure 1 below, we provide a summary of key actors in the mobile money ecosystem and their interactions.

**Figure 1. The mobile money ecosystem in developing nations.**

**Customers**

Customers are the primary users of the ecosystem and they perform transaction using their mobile devices running a communication protocol application which the processing severs can understand. USSD¹ and SIMToolKit² are technologies of choice as they support authentication and can be programmed to run from SIM³ cards on all types of mobile phones. Using this mobile interface, customers can utilize services available on the mobile money platform. After registering and creating an account, the customer’s personal information is associated with their mobile phone number at the processing server. This record constitute a mobile money account commonly referred to as an “e-wallet” or “e-money” account.

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¹ 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, location-based content services, menu-based information services, and as part of configuring the phone on the network.

² SIM Toolkit (STK) The SIM Application Toolkit consists of a set of commands programmed into the SIM which define how the SIM should interact directly with the outside world and initiates commands independently of the handset and the network.

³ Subscriber Identification Module (SIM) card stores the necessary international mobile subscriber identity information required to authenticate and identify a user within a telecoms network.
**MNOs and Processing Servers**

Service requests from customer devices are relayed over MNO infrastructure to processing servers with may be joint or independent entities. In deployment instances of mobile money where MNOs setup the ecosystem, they also manage the distribution channels and processing servers. The processing servers handle requests related to mobile money account creation, account management, funds transfer and bill payment. On completion of each request, the processing server sends a status notifications to involved parties (customer and agent).

For example when a customer requests a funds transfer, the processing server updates the customers e-money account, sends status notifications to both the sender and the recipient of the transfer. Similarly when a customer requests a funds withdrawal, the processing server notifies the corresponding agent, and authorizes the cash withdrawal. Servers may also be optionally integrated with banking applications and issue payment instructions on behalf of the mobile money operator.

**Distribution Agents**

Distribution agents primarily serve as cash-in/cash-out points. Customers fund their mobile money accounts by paying cash at the distribution agents. Similarly they can withdraw cash from their mobile money accounts also at the distribution agents. For the unbanked with relatively low literacy rates, distribution agents play a critical role in helping them perceive and build an understanding of the mobile money solution. They drive the entire ecosystem by providing the primary contact through which customers can build up competencies. Agents provide customer service functions including informal training sessions to customers on how to use the service.

**Merchants**

The merchants represent entities or institutions (such as vendors, utilities etc) that are frequent recipients of fund transfers. Their integration into the mobile money application interface greatly simplifies the payment process by creating a direct channel. For example, the mobile money application running on client devices may include an option to directly pay for TV subscriptions, Utilities (power, water) etc.

**Banks**

Banks serve as a key player in the conversion of mobile money virtual currency to real money and vice versa by maintaining trust accounts to store and retrieve the customer mobile money cash deposits. Bank branches also serve as an aggregation point for distribution agents. They may offer deep integration with the processing servers for automated account monitoring and also a platform for merchants to receive their mobile money payments. Under some circumstances, the banks may be invited to provide financial advisory services to the MNOs in running the entire ecosystem.

**Regulatory Authorities**

The regulators perform functions critical to the sustainability of the mobile money ecosystem. They develop guidelines and policies that cover the areas of value creation, efficiency, innovation, and also oversee the enforcement of compliance. They may also adjudicate in situations of competition within the ecosystem.
Case Examples of Mobile Money Deployments in Developing Nations

We provide case discussions on the mobile money ecosystem in two developing countries of Africa that have experienced fairly different outcomes. In Kenya, the mobile money ecosystems has evolved to become a fundamental method of value exchange, penetrating deep into rural unbanked populations. In Nigeria, strict regulatory condition have given rise to promising models of mobile money implementations that are yet to attain critical mass or adequately address the needs of the unbanked populations.

**Mobile Money Ecosystem in Kenya: M-PESA**

One of the earliest and most successful implementation of mobile money in developing nations is the 2007 deployment of M-PESA in Kenya by a local MNO, Safaricom (part of the Vodafone Group). “PESA” is the Swahili word for cash and “M” alludes to the mobile platform on which the service is deployed. Within its first month in 2007, Safaricom registered over 20,000 M-PESA customers, exceeding planned expectations. The value proposition of M-PESA appropriately captured by its popular slogan “Send Money Home” entails allowing a mobile user overcome cost, delay and geographic and constraints in moving funds to another mobile user. The customer does not need to hold a bank account but only registers for an M-PESA account with Safaricom. M-PESA customers have a mobile application running on their devices through which they can operate virtual stored value (e-money) accounts maintained on Safaricom servers. They can fund these accounts with cash at local M-PESA agents and also make cash withdrawals from same accounts. With their available balance, users can transfer money to other mobile phone users, purchase airtime and simply store value. Other value added services M-PESA provides include the ability to pay bills and premiums to a network of over 100 utilities, insurance brokers, corporate entities, microfinance institutions (MFIs), healthcare institutions, educational institutions etc. M-PESA users appreciate the ease of access, affordability (transaction fees in the order of 0.006%), reliability (instant notifications of transactions) the service provides compared to other channels or financial service delivery. Transactions like cash deposits, account registration and airtime purchase remain free while transaction such as transfers, bill payment, balance enquiry attract a fee. The entire service is informal and flexible in nature, accommodating customers of all levels of education and income. Several use cases of M-PESA application in Kenya exemplify the potential of mobile money in developing nations. In the area of rural healthcare, usage statistics [5] show that M-PESA transfers were the most frequent means by which people acquired sufficient funds to offset emergency hospital expenses. M-PESA has also been able to improve costs for farmers and traders, helping them order and pay for products over large distances. In the area of education, M-PESA has been used by families to source for funds for paying school fees, and in some cases, M-PESA transaction have been used to make direct school fee payments.
Figure 2. Mobile Money Transfers in Kenya make up 22% of an MNOs (Safricom) Annual Revenue

The strongest use case, however remains that of simple person-to-person money transfer. 70% of funds going into an M-PESA account leaves the account before any new payment comes in and in 88% of cases this occurs within 24 hrs (Safaricom, 2013). This suggests the entire system works more like a cash-in-cash medium as opposed to savings medium. More importantly, M-PESA has grown to contribute a substantial percentage of the total revenues earned by Safaricom from 4% in 2009 to 22% in 2013 (Guy Stuart, September 2011). Distribution agents get a commission each time an M-PESA deposit or withdrawal transaction is made and this has encouraged the growth of the distribution agent base from 1,200 in (2007) to over 40,000 (2013) agents covering all parts of Kenya. The M-PESA customer base currently stands at 17 Million people, amounting to a significant 66% of the adult population of the country and 25% of Kenya’s GDP is processed through M-PESA transactions. A quote in the Economist Magazine aptly captures the flexibility and wide adoption of the M-PSA service – “It is easier to pay for a taxi ride in using your phone in Nairobi than in New York” (T.S, 2013). The success of M-PESA has inspired attempts to replicate the model in different parts of the. As of 2012. There were 150 live mobile money services for the unbanked in 72 countries, 41 of them being launched in 2012 alone. Most initiatives are deployed by MNOs which operationally run 72% of all live mobile money deployments (Penicaud, 2012). However, many of the mobile money deployments in the 150 countries targeting the unbanked have struggled to gain traction like M-PESA inspiring discussions on the success drivers of M-PESA.

Mobile Money Ecosystem in Nigeria: Paga and Bank-Led Initiatives

In Nigeria, strict financial controls put in place by the Central Bank of Nigeria (CBN), favor a Bank-led model of mobile money deployment as opposed to MNO-led installations. CBN directives require partnerships with financial institutions as a requisite for issuing mobile money licenses citing the importance of financial transactions monitoring and implementation of Know Your Customer (KYC) compliance. This is even more relevant given the recent overhaul of the Nigerian financial sector that saw the implementation of a radical economic policy and banking reforms (Apati, 2011). A result of this is that many mobile money initiatives in Nigeria are actually mobile banking (m-banking) solutions that assume customer preconditions of owning and maintaining a bank account. Broadly, mobile money solutions in Nigeria can be classified as Independent Third Party led or strictly Bank-led initiatives. In the rest of this discussion Paga is discussed as an example of a Third Party led initiative and examples of Bank led initiatives are also covered.

Paga is a direct to consumer mobile payment services that would allow any user who owns a mobile phone perform electronic transactions, thus turning their mobile device into electronic wallets. Customers may use Paga to send cash, purchase airtime credit, pay bills and pay listed merchants. Paga supports all mobile device models and supports multiple methods of transaction fulfilments. Transactions can be performed using a web-based interface, a USSD application capable of running on all mobile devices, and a mobile applications for java-enabled smartphones. Users can register for a Paga account via the Paga website, via sms or through one of the registered agents distributed across the country. To fund their account they can deposit cash at an agent, at a partner bank, or through the Paga website using bank ATM cards. Users can then spend their funds in direct person-to-person transactions via authenticated SMS, through the Paga website or a mobile device application interface. Transaction amount limits are a

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4 Source : Business Daily Africa (http://goo.gl/kLFPfT)
5 Mypaga.com. My PAGA - transact mobile payments; send cash via mobile; pay bills via mobile.
function of the amount of Know Your Customer (KYC) information the account owner provides. E.g. a customer who provides a name and phone number is able to transfer an equivalent of 190 USD while a verified customer (who provides name, phone number, two references and credit check) is able to make a transfer of 620 USD. Transaction charges range between 1 USD to 4 USD. Established in 2009 as a startup company run by a small core team, Paga has made commendable progress in deploying a mobile money initiative within Nigeria. It has been successful in attracting foreign funding and has announced investments from notable sources like Jim O’Neill, former chairman of Goldman Sachs Asset Management as well as venture capitalist Tim Draper. After working on their prototype solution and surmounting bottlenecks (especially regulatory clearance), Paga opened their services to the Nigerian public in 2011. Starting with 32,000 users and 1.6 million USD transaction value in 2011, Paga has expanded to reach a milestone of 1.3 million users, 4,470 agents and 500 million USD worth of transaction value in 2014 (Paga, 2014). Given the 140 million population of Nigeria and only 21% banking penetration rate (Thomas, 2013), there is still potential for growth in the coming years. Paga represents an uncommon, yet interesting departure from the conventional MNO led or Bank led mobile money model. Instead they operate as an independent entity that adopts a multi-stakeholder approach mobile payments. To this end, they have formed loose collaborations with banks, as well as local and international payment providers such as Quickteller, Mastercard, Visa and Western Union.

On the other hand, Bank led mobile money initiatives include mobile banking solutions developed by the two dominant payment switching companies – InterSwitch, eTranzact and white-labelled by banks such as StanbicIBTC Bank, GTBank, Zenith Banks. Many of these solutions also run on advanced smart mobile device platforms (Android, IOS, Blackberry), that are securely linked to customer bank accounts. These requirements alienate the unbanked, a majority of whom are unlikely to own smart mobile devices or bank accounts. In cases like this where the stance of regulatory authorities place restrictions on key players in the mobile money ecosystem, diffusion of the technology to unbanked populations can be substantially hampered. In Table 1 below, we provide a summary of the case descriptions showing important actors.

<table>
<thead>
<tr>
<th>Service</th>
<th>Model</th>
<th>MNO</th>
<th>Bank</th>
<th>Distribution Agents</th>
<th>Processing Servers</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-PESA</td>
<td>MNO led</td>
<td>Safaricom</td>
<td>N/A</td>
<td>Safaricom Agents</td>
<td>Safaricom Servers</td>
<td>17 million (2013)</td>
</tr>
<tr>
<td>Paga</td>
<td>Third Party led</td>
<td>N/A</td>
<td>N/A</td>
<td>Paga Agents</td>
<td>Paga Servers</td>
<td>1.4 million (2014)</td>
</tr>
<tr>
<td>StanbicIBTC Bank, GTBank, Zenith Bank</td>
<td>Bank-led</td>
<td>N/A</td>
<td>StanbicIBTC Bank, GTBank, Zenith Bank</td>
<td>N/A</td>
<td>Payment Switching Company Servers (InterSwitch, eTranzact)</td>
<td>&lt; 5 million</td>
</tr>
</tbody>
</table>

Table 1. Summary of Actors in Nigeria and Kenya Case Examples

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6 MyPaga - The more details we know about you the more money you are able to transfer. https://www.mypaga.com/paga-web/mobile/pagaForPersonalMoreInfo.paga;jsessionid=0F3EAF815F6DD232912AF145A054E353

7 National Population - Kenya: 43 Million; Nigeria : 168 Million
Bank Accounts in Nigeria : 11 million (http://www.vanguardngr.com/2010/09/130m-nigerians-have-no-bank-accounts-elfina/)

8 A conservative estimate of 50% of the current number of bank accounts
Success Drivers of Mobile Money in developing Economies

A Mobile First Approach

The mobile first design paradigm focuses on a redesign of traditional user interaction flow and interface design adapting them specifically for mobile devices. This approach also builds on pre-existing user behaviors, customizing new processes to fit these behaviors. This approach is driven by specific characteristics of the mobile devices including limited screen sizes, limited processing capabilities, and limited attention span of users. The constraints of mobile devices encourages designers to meticulously focus on elements that are of value. In a similar vein, the mobile first approach can also be expanded to the design of entire system Architectures. System architectures could be simplified by replacing bulky servers with lightweight applications running on existing mobile devices. The design of M-PESA in Kenya can be regarded as an interesting example of a mobile first architecture approach. Considering the decision choice regarding technology to deploy at the distribution agents for managing withdrawals and deposits, available options ranged from POS terminals, magnetic strip cards, high performance smartphones and tablets, to basic software such as USSD and SIMToolkit that can run on base mobile phone models. The final decision was to deploy a SIM toolkit version of the application, similar to the same M-PESA application running on customer devices but with a different menu attuned to the agent’s needs. In order words, the choice of technology deployed was selected primarily based on the current mobile landscape of the target population. Instead of proposing new technology and interface flows, the focus was to deliver a user experience built around the current usage practices. This helped in driving down infrastructure costs and minimizing the training time for new agents and customers, contributing to the success of the deployment effort.

Favorable Regulatory Conditions

Given that mobile money constitutes a nexus of the telecommunication and financial industry, there is the need for appropriate financial regulations to guide the operation of the entire ecosystem. Within the M-PES case, the Kenyan Central Bank was willing to support the project and formulate appropriate policies as the innovation grew and matured. In order to replicate and sustain the M-PESA model in other developing nations, there is a need to actively campaign for governmental and regulatory body support from the onset of such projects.

The Critical Role of MNOs

MNOs are right in the middle of any mobile money deployment endeavor. They can leverage their market share and wide distribution of retail outlets which distribute prepaid vouchers. Their retail agents can be easily adapted to the actor role of mobile money distribution agents, providing the customer services necessary for such endeavors to succeed. Also, MNOs in developing nations tend to OWN their network infrastructure (as opposed to leasing the network lines) as well as hold considerable market share. This way they can implement an end to end security stack that fits the needs of the mobile money deployment. Paradoxically the very characteristics of MNOs that position them strategically for success, also make them unsuitable from the viewpoint of regulatory policies. In many developing nations, it is not uncommon for single MNOs to hold substantial (over 40%) of market share positioning them to create even greater monopolies if allowed to spear head mobile money initiatives. Thus, there is a need for crafting policies that will allow MNOs leverage their capabilities in deploying these systems but limiting their ability to solely appropriate the entire value created.
Dearth of Alternatives within Unbanked Populations

The success of M-PESA is tied to its strategy of targeting the unbanked, a significant population with clear needs addressed by the system. Also, given the unavailability of other alternatives, M-PESA becomes even more attractive to its adopters. For example, a rural farmer would have to pay transportation costs, risk being robbed while travelling with cash in order to reach urban areas and purchase farm supplies. With M-PESA an agreement is easily reached where the farmer contacts suppliers by phone, pays a deposit on farm supplies and full payment on receiving his wares. The benefits are very real.

Conclusion

In this article, we have reviewed the key actors in the mobile money ecosystem, discussed the state of mobile money through case studies and synthesized important success factors that could potentially drive these technologies to matured levels. We believe the following important lessons must be taken into consideration in building successful mobile money implementations

- A mobile first approach to implementation that focuses on leveraging existing capabilities (technology and infrastructure) as opposed to building new ones. This would reduce cost and increase usability.
- Development of improved regulatory policies that strike a balance between compliance with financial regulations (KYC) and inclusion of the unbanked.
- Integrating ecosystem actors that possess a network of distributed agents that can be harnessed to provide critical engagement with the unbanked. In many countries, MNO’s are in the best position to serve this purpose strengthening their candidacy as leaders of mobile money initiatives. The other alternative (adopted by Paga) would be to slowly build up this network of agents.
- A critical re-evaluation of existing mobile money solutions to ascertain their alignment with the needs and circumstances of the unbanked. Given the earlier discussed user-centric nature of mobile money technologies, it follows that sustainable implementations of the technology should follow similar user-centric paradigms. In scenarios where a misalignment occurs, such as is observed within mobile banking solutions in Nigeria, adoption primarily by the scant banked (Stein, 2011), a trend that is likely due to preconditions the unbanked populations just cannot satisfy.

The problem of the large unbanked populations unfortunately remains prevalent (Alberto Chaia, 2009) in many parts of the world. The absence of critical banking services continues to be a major setback, militating against the expansion of the middle class; an effect that is even more pertinent in developing countries of the world. As of today, the most viable solution in these regions are mobile money implementations, necessitating updated discussions on the challenges, successes and lessons associated with mobile money endeavors. Mobile money has also been a key driver for global development goals such as financial inclusion, outnumbering bank accounts in countries like Madagascar, Uganda, Tanzania and Kenya. It is also contributing to employment in these regions as there exist more than 500,000 mobile money agents as of June 2012, with the number of mobile money agent outlets exceeding the number of bank branches in at least 28 countries (Penicaud, 2012). In countries like Nigeria where only 21% of the adult population were banked in 2013 (Thomas, 2013), mobile money holds great potential for contributing to economic development.
REFERENCES


