

# EMPOWERING MICRO-ENTREPRENEURS AND SMALL BUSINESSES THROUGH MOBILE PHONES IN EMERGING MARKETS AND DEVELOPING COUNTRIES

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## Abstract:

Mobile phones are becoming increasingly affordable for people at the lower end of the income pyramid. This article illustrates by means of two case studies in India and Kenya how user-friendly mobile phone applications have increased access to finance and relevant business information for the poor. As a result, millions of local entrepreneurs in developing countries are able to expand their small-scale businesses by overcoming institutional hurdles and infrastructure constraints. Even though there are still many challenges that have to be addressed, existing experience with mobile phone technology clearly shows that it is able to add more value to local knowledge and thus lead to social and economic empowerment.

In the subsequent sections, three critical success factors are discussed: Overcoming inherent technology risks, the need for educated customers, and the need for providers and governments to collaborate. The article also discusses the potential of mobile phones to contribute to sustainable development by jump-starting an empowerment process that reduces poverty, creates more employment and helps regions to better cope with their social and environmental problems.

## 1. Introduction

In the past years, access to financial services in emerging markets and developing countries has increased tremendously. IFC, a member of the World Bank Group, alone provided access to finance to 6 million in 2011. The World Bank Development Indicator shows for the years 2006 to 2010 that the poverty ratio, i.e. people living with less than USD 1.25 (PPP) per day, has been significantly reduced in some countries. For example, Peru was at about 45% in 2006, in 2010 the poverty ratio was at 31%. Bangladesh was at over 40% and in 2010 at about 31.5% or Kyrgyz Republic at over 60% and in 2010 achieved a poverty ratio of 34%.

Still, in 2010, about 2.7 billion people—most of whom live in developing countries—did not have a bank account. This largely excludes them from doing business in the formal economy because they cannot count on a safe environment for money deposit, they cannot save for long-term

business investments and they are unable to transfer money and make safe payments.

Without access to finance, poor people cannot acquire tools to increase productivity, start a microenterprise or small business, invest in education or health, or even take time to search for better opportunities. Inadequate, inaccessible financial services are undoubtedly one of the reasons why low income people are trapped in poverty.

In the past, monetary transactions required a physical location and people needed transportation to get to the location, both of which can be problematic in infrastructure-constrained countries, particularly in rural areas. Therefore, costs for money transactions have been prohibitive, if possible at all. The same is true for information-based transaction costs. Therefore, we have to assume that about four billion people at the lower end of the income pyramid pay a higher price for services and products. This so-called poverty premium in infrastructure-constrained countries is even more articulated in, e.g. healthcare, energy use.

The empowering potential embedded in enabling technologies such as mobile phones is the focus of this article. We look at mobile phones from mainly three aspects: First, the lower transaction costs leading to access to financial services to large segments of people at the low end of the income pyramid such as micro-entrepreneurs, smallholder farmers, and small businesses. Second, we highlight how mobile phones contribute to reducing the poverty premium through lower information-based transaction costs. And third, we highlight how participation in communities leads to educated, empowered decisions. In other words, mobile phones allow people to empower themselves, access knowledge and contribute to communities – within their reach and capability. This will also be illustrated and discussed in the two case studies below.

Opportunities and challenges of enabling technology such as mobile phones can play a crucial role in working towards a better world or initiating such development.

## 2. Opportunities created by Mobile Phones

At the end of 2010, about 73 percent of the world's mobile phones were used in developing countries. In the African region, the penetration rate has reached an estimated 41 percent (compared to 76 percent globally), leaving a significant potential for growth. A key opportunity in this development is to provide financial services at lowest possible transactions costs in an environment where most people make one to two transactions a month with very small amounts transferred.

Let us take a close look at the cost of money transactions, i.e. getting cash into and out of brick and mortar banks. The Gates Foundation recently published the results of a survey conducted with seven service providers in Asia, Africa, and Latin America that compares the costs of servicing a transactional savings account in the traditional way—that is, by facilitating transactions at bank branches—with the cost of doing so using third-party service providers such as mobile phone companies that are empowering users to perform cash-in and cash-out transactions.

The magnitude of the difference is striking. The monthly cost of servicing a savings account using a cashier in a bank branch, even assuming full utilization, was roughly four times greater than doing so using mobile phone company services. The big driver, as one might expect, is the allocation of fixed costs associated with branch construction and setup: According to the Foundation's analysis, "a branch cashier incurs more than 78 cents in fixed costs per transaction, compared to just... 4 cents or less for a mobile-enabled transaction or mobile wallet".

Also, unlike a brick & mortar bank, which typically distinguishes between profitable and unprofitable customers based on the likely size of their account balances and ability to absorb credit, the business model for mobile money looks differently. For example M-Pesa, where M stands for mobile, Pesa for money in Swahili, serves any Safaricom mobile customer who pays for an account. M-Pesa is the product name of a mobile-phone based money transfer service of Safaricom, which is a Telkom Kenya and Vodafone affiliate.

The high cost of facilitating deposits and withdrawals in bank branches is a major stumbling block for financial inclusion. You don't have to be a banker to think that it will be hard to make money offering poor people accounts when it costs you 78 cents to facilitate every deposit and withdrawal, particularly since poor people's account balances are typically small, meaning you can't earn much by lending those deposits out. Banks can solve this puzzle by charging customers fees; but fees drive price-sensitive poor customers away.

Using low-cost agents to facilitate cash-in and cash-out transactions is therefore an obvious way to make financial services more affordable to micro-entrepreneurs and small businesses. Some banks, mostly in Latin America, are using networks of cash-in/cash-out points

such as Globokas Peru. This network serves users from different financial institutions, for example BBVA Continental, Mibanco, various Peruvian Cajas, Banca Financiera. Others are leveraging networks built by other partners; a number of banks in Kenya allow their customers for example, to make deposits and withdrawals via M-Pesa.

Reducing the cost of deposits and withdrawals by setting up networks of independent retail agents is one of the most important roles that non-banks can play in financial inclusion - and it's one of the reasons that banks and non-banks alike need to be able to set up networks of independent agents. If they can't, bank branches will remain the sole gateways to financial access - at the expense of those who lack it.

### 2.1. The potential of mobile phones to reduce poverty

Another key opportunity of adopting mobile phones lies in reducing the poverty premium through lower information-based transaction costs. While these costs have continued to keep farmers and small businesses entrenched in their subsistence or shadow economy, the mentioned penetration of mobile phones may change this even in rural areas, where communication and transportation infrastructure are often non-existent or unreliable. Mobile phones have the potential to leap-frog these obstacles by delivering valuable information to people in hard-to-reach places. For example, farmers can get information on micro-climate, local market prices and other subjects of relevance in a rich-content format. At the same time, applications on mobile phones, such as the Tata Consultancy Services Mobile Agro Advisory System enables farmers to send queries in their local languages specific to their land and crops, and receive personalized replies from agricultural experts on their phones.

John Jagwe concluded in his research thesis about impact of transaction costs on the participation of smallholder farmers that access to market information is extremely critical to decide about market participation. As regards the intensity of participation, the study established that price is an incentive to sell. Perishable goods are also more sensitive to the effects of transaction costs.

Studies have shown that mobile phones can play a role in reducing information-based transaction costs. For example, Jensen illustrated that the adoption of mobile phones by fishermen and buyers in Kerala (India) resulted in a dramatic reduction of price dispersion and the complete elimination of waste. Similarly, mobile phone usage among grain sellers led to significant reductions in grain-price dispersion net of transport costs across markets in Niger.

Information-based transaction costs as well as other costs related to seeking this information, which are defined as "search costs" can be reduced throughout the stages of the value chain. Harsha de Silva et al have shown that on average, 15% of the cost of production for vegetables account for transaction costs of which 11% are search costs.

Evidence from literature suggests that transaction costs are the main obstacles that prevent people from participating in markets. With the increasing concern in regard to reducing poverty in the world, lowering transaction costs within the value chain is one of the key elements to ensure sustainable growth, which will in turn have an impact in reducing poverty. Micro-entrepreneurs, small businesses or small-holder farmers reducing costs throughout their value chain will be able to realize higher profits and greater efficiencies.

## 2.2. Participation and empowerment in local communities through mobile communication

As a third opportunity, we would like to highlight, how participation in communities leads to educated and empowered decisions. A group at the University of Illinois has produced several videos that demonstrate simple, low-cost ways to improve the lives of people in the developing world. One video shows farmers how to make a natural insecticide out of seeds from a local tree. That visual information includes a video of how to close specially-designed storage bags so that they are airtight and protect crops from insect pests. "Closing the bags is something that, if you see it, you will understand it very quickly, and most people do. But explaining it in words is quite difficult". The research team concluded that one of the most remarkable things about mobile phone videos is how fast they can spread. It is interesting, not surprisingly though, that locally developed videos where people are able to see their local landscape, for example the way they build houses, their granaries have a higher adoption rate and culturally, it is more appropriate.

## 2.3. Mobile phones and health care

In addition, mobile phones have the potential to revolutionize health care in developing and emerging countries, particularly in the area of health awareness and training health care professionals. Mobile phones are generally affordable and available, making them more accessible than computers and far more cost-effective than hospital beds.

A United Nations Foundation Partnership with the Vodafone Foundation focusing on mHealth for three years came to the conclusion that mobile phones are so ubiquitous in emerging markets that they are now being used to enable patients adhere to their prescriptions, to convey education programs to improve health awareness, or to conduct data collection and training of health care workers.

Educational awareness can be improved by using simple text messaging to disseminate information. A group called Text to Change operating in Uganda sends small text messages (SMS) to the population to improve awareness of HIV Aids treatment and prevention. SIMpill is another example of an SMS service, being used to help combat diseases. This time it is about making sure people take their medication. It was used during a 2007 trial in South Africa to ensure people took their medication for tuberculosis (TB). In the pilot, 90% of patients complied

with their TB medication compared to 22% to 60% take-up without it.

To conclude, mobile phones empower people at the lower end of the income pyramid to become better integrated into the formal economy. Mobile phones allow them to significantly reduce transaction costs, to participate in markets through lower information-based transaction costs, and most important, to allow them to engage more actively in their communities, which in turn, leads to educated decisions in local business and politics.

## 3. Critical success factors

Mobile phones are a great tool of empowerment for the reasons discussed above. Nevertheless there are three critical success factors that have to be taken into consideration:

First, the challenge to overcome inherent technology risk associated to mobile phone users. Second, the need for customers to be informed and what that means for service providers, and third, the need for collaboration between providers and governments for reliable infrastructure and support of services for users, i.e. the right balance between customer protection and facilitating access to a new market has to be found.

Technology risk such as fraud or theft is one of the critical factors when it comes to mobile phones offering access to financial services. Fraud can take place both at the customer level where his/her account is being compromised by the fraudster or at the system level where the fraudster is able to overcome security measures and thus gains access to financial information and money. This factor is of particular importance for mainly two reasons: First, customers are new to the services provided and due to their unfamiliarity with the system might often be more prone to fraud. Second, in countries where transparency at the government or company level is not always guaranteed, fraud will be difficult to detect and assess in magnitude and scale. This makes it particularly dangerous for customers. Third, infrastructure that supports mobile phones and payment systems in emerging countries is less dependable. A reliable infrastructure is often taken for granted in the developed countries and damaged systems are expected to be quickly fixed. This is not necessarily the case in emerging markets. Mobile networks often are at higher risks of breaking down due to the tougher environments. Also, it is more difficult to repair them due to lack of supporting infrastructure.

The second critical factor is related to the usage of the new services. Being able to use mobile services cannot be taken for granted. Illiteracy, for instance, can be a major obstacle to the usage of mobile phones and its related services. Usage also needs to be widespread to reach its full benefit. In communities where mobile phones are only accessed by a limited group, this group is at risk of taking advantage of the information asymmetry against other members. The risk is particularly

important in communities already prone to such exclusions, so we observed. Also, people at the lower end of the income pyramid need the ability to understand and use the credit offerings provided on mobile phones in a correct way. For example, accessing a loan via mobile phone from a microfinance institution can be a great benefit to micro-entrepreneurs and small businesses. However, procedures need to be in place to make sure the offerings are properly understood. In case of a loan, this would mean that the users know the difference between cumulative interest rates and simple interest rate so that they can understand the actual cost of the loan. Many other aspects of the loan would have to be clearly communicated such as terms of lending, penalty of no or delayed repayment, risk of default, contact person in case of problems, etc. Moreover, electricity might be shut down or not be available in the customer location creating potential problems to complete a transaction or recharge a phone. Mobile operator signal strength might not reach a region or the operator of the financial service (where separated of the operator) might experience downtime. These factors are risks to the customers that need to be taken into account when considering the virtues of the technology.

That brings us to the third critical success factor, namely that throughout the value chain, the different participants need rules and regulations for fair play: Customers should draw as much benefit as possible from the technology but keep safeguards in case of technology failure. Companies involved should understand the situation of their customers and the importance of building reliable and easily understandable offerings.

#### 4. Selected cases shedding light on technology serving development

##### *Case Study 1: Voice technology revolution in India*

Financial inclusion is a major challenge in India. Today 41 per cent of the population is unbanked and the number of loan accounts constituted is a mere 14 per cent of the adult population. This exclusion from payment and credit is due to different factors. On the supply side, a lack of infrastructure, government regulation and high management costs act as major barriers to entry. On the demand side, distances to bank branches, lack of awareness, social exclusion, cumbersome documentation and procedures, unsuitable products and language barriers act as main impediments.

These challenges are now in the process of being overcome. The first push was made by the government. A major move was made in September 2010 when the Reserve Bank of India (RBI), decided to allow banks to engage for-profit companies as Business Correspondents' (BCs). These BCs, such as small shop owners, are now allowed to provide banking services that used to be performed at the branch level of the bank. As a result, the use of existing local distribution channels enabled a dramatic reduction in the cost of implementation of banking services. The second major push comes from the technology side. Mobile phones subscription in India has soared in 2012 to 65% of the total popula-

tion and is now adding a staggering 20 million new subscribers every month. This is a crucial change as mobile phones today can be used to perform both the customer's unique identification and the interactive communication necessary to perform a transaction. Some of the most innovative technologies allowing for such purposes are Voice Recognition Technologies. Uniphore, a Chennai based start-up, is developing such technology. This technology uses Voice Biometrics in vernacular languages to identify users. Furthermore a speech recognition technology is used at Uniphore to recognize customers' requests and answer them in real time. Both together are allowing for the first time for a full transaction to take place over the phone. The final enabler can be found in the ecosystem that one can find in India. Looking at Umesh and Ravi, the two founders of Uniphore, we see key ingredients for a company to reach excellence. This includes a highly skilled and trained team, a strong board with deep industry know-how and understanding on regulations, a work environment filled with successful entrepreneurs and privileged access to know-how, mentors and finance to be found in different incubators and investors reaching the business.

The results have been impressive and Uniphore technology is now being used by more than half a million users while the company has been building relationships with over five banks including the State Bank of India. The impact on the community has also been strong. Take Alam, a Business Correspondent that is now using Uniphore technology. Alam describes how in the past, villagers used to travel over 40 kilometers outside of their village to reach the closest place with banking facilities. Villagers are now coming to him in Khathalguri offering him a customer base of over 800 people. Not only did his financial position improve but it created him a new identity. Indeed, he became more than just a banking outlet and is now seen as a trusted authority, teaching his customers about the importance of savings and the use of banking services. Also, villagers using the technology can now make more transactions and reduce their cost of transactions thanks to less travelling. Besides new customers, particularly illiterate people that used to be excluded due to their inability to fill the required forms, have also joined the service and have now the chance to access fully fledged financial services. Although Uniphore technology is now empowering people in more than five industries including Agriculture, Education, Retail, Healthcare and Finance, there are still many challenges ahead.

At the start, Uniphore's greatest challenge was to understand its customers' needs and requirements. For instance, many transactions were not going through for no apparent reasons and customers stopped using the service. Some reasons were found in customers' cultural habits where for instance clients asked to give their names were systematically adding a greeting before speaking. This was confusing and causing a "false negative", i.e., the right client was not correctly recognized by the system. Other environmental issues such as heavy background noise and changes in mobile phones have also been major causes of false negatives. Yet Uniphore has now improved its technology and is now only counting 3% false negatives and a staggering 0% false positive

(wrong person being rightly identified). The main challenge now remains in clients' education. This not only includes teaching clients how to use the technology but also teaching the clients to trust the system. Voice technologies are very new in India and customer's adoption remains slow due to the lack of awareness on the technology safety and usability as for many it will be the first time they use a service with Interactive Voice Response (IVR) where a computer is used to communicate with them. New challenges are also to come as scale increases. The main ones are found around the technology that needs to ensure low cost transactions, reliability and uptime. The sole use of mobile phones to complete transactions have allowed for cost to remain low. This will need to be further sustained in an environment where Voice Technologies are subject to patents and royalties. Any change in this cost base could negatively affect both the company using it as well as its customers. Besides, the lack of reliability and the ability to have a service constantly running are in many ways the biggest threat for clients. Working poor have a very high sensitivity to failure; most of their earnings are used in daily expenses while only a fraction is saved. Adding to this the fact that these people are often excluded socially and geographically, any problem in the technology causing for their savings to be lost or a payment to be blocked or unavailable could have terrible consequences for the customer and his or her dependents. These challenges need to be overcome if Uniphore aims to fully deliver on customer expectations and reach for the 900 million mobile phone subscribers India has to offer.

#### *Case Study 2: M-Agriculture revolution in Kenya*

With 60% of the population living in rural areas, farmers in Kenya encompass the majority of the population. Yet, they face very difficult conditions and over half are subsistence farmers. These farmers often lack information. For example, they do not have access to crop prices and as a result have to sell their products at giveaway prices to eventually abusive middlemen. Farm inputs are also very expensive due to the low quantity purchased and again the obligation to go through a middleman. Last, this lack of information prevents farmers to get access to weather forecast, new cultivation techniques or new crops that might be more suitable for them.

Mobile phones and a young start up called Mfarm are changing the situation for many farmers in Kenya where the mobile phone penetration rate jumped from 5% to 42% from 2003 to 2008, experiencing a growth rate of over 50% per annum. It is via this channel that Mfarm is trying to address farmers' challenges. To do so, Mfarm has developed three main products. The first one allows farmers to check crop prices via their mobile phones. Farmers send a premium SMS to a predefined number and receive in return their selected crop price for the city they chose. Premium SMS is used to insure that Mfarm is being paid for its service but also to allow customers to access the information through any type of handset. The second product developed by Mfarm is a group buying solution. This solution allows farmers to get together and order in groups farm inputs such as fertilizers. The demand is made again via premium SMS while the payment is completed via M-Pesa, Kenya's largest mobile payment

system. This model allows farmers not only to cut off the middleman but also get better prices and terms when buying their products. The last product developed by Mfarm is an e-commerce platform enabling farmers to directly sell their products online to buyers in Kenya or abroad. This again allows them to cut the middleman and increase their margins.

The results have been impressive. Mfarm serves over 2000 farmers that are already subscribed to the system and are paying for the service. Mfarm records claim a 50% increase in their profit and a 30% saving on the cost of inputs. This was experienced by John Nderitu, a young farmer living at the outskirts of Nairobi, Kenya capital city. When interviewed by CCTV Nairobi, he explained to have greatly gained from being able to sell his product directly to customers and to lower his purchasing costs. Initiatives like Mfarm are therefore crucial for the development and of self-sufficient food markets in Kenya. Yet it is not only the farmers that are empowered. Mobile technologies are directly empowering entrepreneurs by allowing them to start promising companies at very low cost (Mfarm start up funding was for instance a mere 10'000\$). This was the case for Jamila, Susaneve and Linda, Mfarm co-founders and fervent social entrepreneurs.

Mfarms also had to overcome many challenges. The first challenge was to develop an affordable solution that could be easily understood and accessible to all farmers. The second was to offer reliable information. Prices in the markets varies even within a market, finding the right price for a crop hence requires careful attention and extensive work over different cities and markets. Bringing the technology to farmers and showing them how to use it has been another key challenge. Today the main challenge is to scale up operations. This is particularly demanding in a country where Venture Capital investments are not as developed as in Europe or America and where skilled labor is in high demand and expensive. Yet Mfarm developments have been promising. Mfarm emerged as the winner of the Startups Bootcamp event IPO48 in October 2010 and has recently been accepted by the "Unreasonable Institute", a US based institution that aims at "solving the world's biggest problems by arming the entrepreneurs who can take them on with the mentorship, capital, and network to make it happen". They considered the development of Mfarm and how it changes farm business in Kenya and Africa by mobile technologies is of utmost interest.

#### **5) Conclusions**

In this article we have shown by means of selected examples in India and Kenya how mobile phones can help empowering the poor by ensuring access to valuable information and dramatic cost reductions for financial transactions. These are very critical aspects considering the small amounts transferred by the poor in remote areas.

We have illustrated that this leap-frogging technology goes beyond improved access to finance but also includes lower transaction costs in the search for business-relevant information. Both are unprecedented enablers to economic and social development in areas most in need for change. The selected case studies point out how people at the lower end of the income pyramid are allowed to become active participants in business that are treated with dignity and equality.

*This type of bottom-up development that also leads to an increase in efficiency throughout the value chain of financial transactions must become the backbone of long-term sustainability.* Governments, however have to assume their role as facilitators in order to reach continuity and predictability in a highly dynamic environment. They have to ensure a regulatory environment that effectively protects consumers and contracting parties but also enables small entrepreneurs to cope with the cost of regulation. For that purpose, governments should also support an entrepreneurial infrastructure that makes it possible for small entrepreneurs in the informal sector to make the successful transaction to the formal sector allowing them to scale-up their business and grow.

Reliable mobile phone networks and affordable mobile phone services have become an essential part of this entrepreneurial infrastructure. It allows millions of small businesses and micro-entrepreneurs in developing countries and emerging markets to thrive and thus help to meet the many needs in their local environment.

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