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Mobile phones: the silver bullet to bridge the digital divide?

by ROXANNA SAMII

Introduction

The International Telecommunication Union (ITU) estimates that there are 3.3 billion mobile phone subscribers worldwide.[1] The vast majority of users never part from their ubiquitous mobile phone. These little hand-held devices can contain our daily appointments, address book, emails, photos, music and even allow us to access the Internet.

The mobile phone is equally important for our brothers and sisters in developing countries. It has revolutionised the lives of millions of urban and rural poor by connecting and involving them in viable economic activities. Mobile telephony is affordable, scalable, self-sustaining and empowering. Mobile phones are paving the way for men and women to achieve socioeconomic goals and provide food security to their families. They provide a wide range of services at a reasonably low cost. They are becoming more affordable, because of flexible and different pricing models. Handsets cost between US$40-50. Airtime is also affordable – this is why prepaid services are so popular in Africa. If one person in a village has a mobile phone others can use it – a mobile phone is not necessarily confined just to one person.

Mobile telephony is the predominant mode of communication in developing countries. It has contributed substantively to reducing the digital divide – something other information communication technologies (ICTs) such as computers did not manage to achieve. For many, mobile phones are a more appealing and viable tool than previous initiatives like telecentres (see Box 1). And they are the only

Box 1: Mobile phones and the demise of telecentres

The telecentre movement in the late 20th Century aimed to provide access for people in developing countries to ICTs, computing and Internet services. A number of donors funded telecentre projects with the vision of bridging the digital divide.

Telecentres faced a number of challenges. They were mostly located in isolated and remote areas to serve an entire village or community. Villagers usually had a long walk to reach them. Providing basic ICT infrastructure and connectivity was costly and it was hard to service broken equipment because of the remote locations.

However, financial sustainability posed the biggest challenge. Usually, when funding ended, telecentres gradually turned into shabby shacks with broken and/or obsolete equipment. Unlike mobile phones, telecentres did not promote entrepreneurship growth and employment opportunities, such as selling pre-paid airtime cards, renting out handsets, or recharging battery services.

With mobile handsets, poor rural women and men do not need to walk to remote telecentres to access ICTs. Instead, they have simultaneously bypassed the landline, the laptop and the need to connect to the Internet.

[1] ITU is a United Nations specialised agency for telecommunications. ITU collects the most comprehensive range of statistics on Information and Communication Technology (ICT) penetration, accessibility and use. See: www.itu.int/ITU-D/ict/publications/world/world.html

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ICT sector where developing countries are catching up with – and in some cases – overtaking developed countries.

Mobile telephony is providing timely, localised and relevant access to information, which has helped reduce production and transaction costs. For example, poor rural people use mobile telephony to receive commodity price information via mobile phone text messages, or Short Message Service (SMS), to gather market intelligence so that they can make targeted trips and save on travel and transportation costs. Mobile phones are also being used to provide medical services such as using SMS to remind patients of medical appointments and vaccinations or to disseminate information about sexually transmitted diseases and to monitor patients.

Mobile phone revolution: the numbers speak for themselves

Every generation needs a new revolution.
Thomas Jefferson

The mobile phone revolution is our generation's revolution. It has changed our culture, economy, and social and political lives. It promises to become the first universally accessible ICT. And it is a unique revolution.

- It is truly global and not limited to a specific country, region or sub-region.
- It has been a catalyst for unprecedented global economic and social benefits.
- Because it is global, it is becoming increasingly more accessible to those who are marginalised and less advantaged.
- It is an early example of a mash-up when this term did not even exist.[2] Mobile phones are now integrated platforms offering both content and telecommunication services. Some models also incorporate cameras and can record videos etc.

Some argue that new ICTs such as mobile telephony increase the gap between the 'haves' and 'have nots'. Yet ITU statistics show that 3.3 billion people (50% of the world population) are mobile subscribers against 1.3 billion Internet users. Approximately 72% of total global telephone subscribers are mobile subscribers. Recent estimates show that in Africa, only 6.5% of people are Internet users, while nearly 281 million people (30%) are mobile subscribers.

In Africa, many countries have completely skipped the telephone landline and have moved directly to mobile telephony. One could argue that this makes mobile technology the first modern telecommunications infrastructure in this continent (see Box 2).

The anecdotal example in Box 2 shows how those previously excluded because of lack of infrastructure can now take an active part in improving their livelihoods thanks to the affordable and different pricing schemes of mobile services. There **are** people who are excluded and may even be worse off because market access now **relies** on inclusion, but mobile telephony has brought more inclusion. The herder in my personal example does not have access to a fixed telephone line, therefore previously he was excluded. Today, thanks to mobile telephony he is not. Although we are still lacking empirical evidence, what we are observing indicates that mobile telephony most probably does not (and will not) create exclusion because it is affordable and easy to use.

Box 2: Out of the blue in Eritrea…

In November 2008 I visited a remote and isolated irrigation site in the Gash Barka region, part of the International Fund for Agricultural Development (IFAD)-funded Gash Barka Livestock and Agricultural Development programme. During the field visit I stood in awe when the mobile phones of the extension worker and a herder started ringing.

I had not seen any mobile phone signal transmitter towers on the way there. However, there was reception and both the herder and extension worker were able to communicate. The extension worker imparted some technical information to his colleague and the herder inquired about the possibility of taking cattle to the Asmara livestock market on Monday.

Rural connectivity: a revolution within a revolution

The mobile phone can catalyse development and help eradicate rural poverty. Seventy-five per cent of the world's poorest people – 1.05 billion women, children and men – live in rural areas and depend on agriculture and related activities for their livelihoods. We may think that for them a mobile phone is a luxury. But guess what? We are wrong!

A recent World Bank study states that 'there is a myth that the rural poor are not able or not willing to pay for mobile telecommunication services' (Bhavnan *et al.,* 2008). Observations in the field are that mobile phone accessibility

[2] A mash-up is a derivative work consisting of two pieces of media joined together. Source: Wikipedia. See also glossary, p.122 (this issue).

Farmers Dina Lungu and Elizabeth Chikusu send an SMS to find out the latest maize prices.

Photo: Alex Price

Market investigator Stanley Mchome uses his mobile phone to help farmers get the best possible prices for their produce.

Photo: M. Millinga

is helping to facilitate previously marginalised groups to take a more active part in the economic and social spheres of their communities and beyond, such as women, landless workers, herders, fishers, small-scale farmers, indigenous peoples and illiterates with no access to basic services.[3] Many poor rural households now spend 4–8% of their income on mobile telephony (Hammond *et al.*, 2007).[4]

Mobile phone growth drivers: a unique business model

A number of enabling socio-economic and political conditions such as ease of use, liberalisation of the telecommunications sector and prepaid services have contributed to the expansion and popularity of mobile telephony, especially in rural areas of developing countries.

Compared to computers, mobile phones are much **easier to use**. They require little or no specialised computer and media literacy skills, unlike the Internet and applications like email. Previously low penetration rates have encouraged service providers to invest in new areas to increase business.[5] There are shorter payback periods on investment both for the private/public sector investors and farmers and low installation costs. All these factors have contributed to the rise of the popularity of the mobile phone.

The **liberalisation of the telecommunications sector** supported by sound regulatory mechanisms has opened the market to competition. This has encouraged private sector investment in developing countries, and increased competition among different operators. As a result, consumers are benefiting from better services at better rates.

In Africa **prepaid subscriptions** accounts for 95% of total mobile subscriptions. The 'pay as you use' business model offers numerous advantages to poor rural people. There is no formal registration or waiting lists. The user does not need to submit financial and physical data and s/he can control costs, especially when savings and incomes are low. Most importantly there is no need to present a credit history, as the prepaid service reaches out to the 'unbankable'.[6]

Innovative use of mobile telephony brings economic prosperity to poor rural people. For the 1.05 billion rural poor people living on US$1.25 a day or less, the mobile phone represents a viable way for improving their lives. It is enabling small entrepreneurs to have direct access to market intelligence, providing employment opportunities and creating opportunities for public and private sectors to invest and modernise infrastructure. World economists may be busy understanding the full impact of the current financial crisis, but they are equally struggling to calculate the macroeconomic impact of the mobile revolution.

Mobile phones and small businesses

Mobile phones have spearheaded a host of new and innovative income-generating activities for small businesses. These include recharging mobile phone batteries, selling prepaid cards, renting out phones and/or airtime and other services such as reading and sending SMS messages. In Africa and elsewhere, occasional labourers put up adverts in village

[3] For example, keeping in touch with family and friends, accessing previously less accessible information – such as weather reports or commodity prices – or simply having a point of contact, which previously was a luxury.
[4] *The Next 4 Billion* shows that 'low-income' does not mean 'no income'. It highlights how expenditure on ICTs and mobile telephony are consistently increasing.
[5] Penetration rates refer to the number of active mobile phone numbers (usually as a percentage) within a specific population.
[6] i.e. those who without the prerequisites to open a bank account, which means many in rural populations.

Twaha-Abdallah communicating commodity prices.

Photo: M. Millinga

centres with a mobile phone number to offer services, or subscribe to receive job alerts via SMS from unemployment centres. Mobile phones can also minimise travel costs allowing people to move when there is a concrete economic opportunity.

A 2005 London Business School study found that 'for every additional 10 mobile phones per 100 people, a country's gross domestic product (GDP) rises 0.5 percent' (Waverman *et al.*, 2005). According to the study:

- In South Africa, a survey of small businesses run by black people showed that more than 85% rely solely on mobile phones for telecommunications. Of these, 15% previously had no access to telephony. Over the last decade the number of businesses using mobile phones in South Africa has increased by nearly 125%.
- In Egypt, 90% of the informal sector (including small retail, manufacturing and service activities) relies exclusively on mobile telephony.
- In South Africa, 62% of businesses (and in Egypt, 59%) said mobile use was linked to an increase in profits.
- In Tanzania, 97% of people surveyed said they could access a mobile phone, while just 28% could access a landline phone.

Mobile phones and access to market information

For producers, access to reliable market information increases income (see Box 3). In the past they relied on governments to provide market information. In addition, transaction chains are long, volumes of goods are often small and of varied quality, and prices are highly unstable. For example, small producers trading in rural areas in Africa face enormous challenges such as lack of access to reliable and up-to-date market information, poor transportation infrastructure and competition. Small producers are vulnerable to unscrupulous traders and middle-men giving them prices at below-market rates. Producers may be reluctant to diversify into different products for fear of not finding a profitable market for their output.

The relatively affordable airtime of mobile phones has made transfer and exchange of information easier. Information dissemination happens either through structured services and subscriptions such as Tradenet.biz and Zambia SMS Market Information Service or through unstructured and informal use of mobile phones – and by blending formal and informal services. People can use their mobile phone both to directly communicate with buyers and also to access commodity prices via SMS (see Box 4).

Cellular banking: the bank of the 'unbankables'

Mobile phones are now providing 'cellular banking' to 'unbankable' clients. For example, millions of poor rural people now use their mobile phones to send money home and to deliver microcredit loans where there are no banking facilities.

Box 3: How new technology can strengthen rural markets

Increasingly, private sector companies are providing market information to farmers. Tradenet.biz is one such enterprise. Although still in its infancy, it already covers 15 countries and 500 markets. It is available to users anywhere in the world. It offers a range of key information to producers, processors and others working along the supply chain: from price updates, harvests, transport, trading offers, disease outbreaks, weather and more.

Tradenet.biz uses markets as a venue to raise awareness about its services. Tradenet agents set up kiosks and offer market information advice, register people for the service and configure alerts on people's mobile phones.

Tradnet.biz also uses new peer-to-peer technology, which allows users to share their resources – in this case information – via mobile phones to create a service. It also links the vast and growing database of market information to cellular networks. See: www.tradenet.biz

Box 4: Mobile phones open up markets for fishermen

On the island of Mauritius, the fishers of the Tamarin community under the IFAD-funded Rural Diversification Programme do not have direct access to the fish market. As a result, they are excluded. However, they use their mobile phones to inform buyers of their daily catch and to take orders. This way they do not over fish and are sure that they will sell their daily catch. This has increased economic efficiencies and also helps to protect fish stock – which in turn has a positive impact on the lagoon ecosystem.

Remote village in Eritrean Gasha-Barka region lacking running water and stable electricity, equipped with satellite dish.

Photo: Roxanna Samii

According to the Consultative Group to Assist the Poor (CGAP), approximately 1.5 billion mobile users in developing countries have little or limited access to formal financial services.[7] With limited formal banking infrastructure there are fewer options to transfer money and access banking services. CGAP argues that the mobile phone could potentially provide a low-cost alternative to banking via the Internet, cash machines or point-of-sale, cutting costs by up to 50%. Microcredit and microfinance institutions have enough evidence to unleash the potential of cellular banking and start creating 'branchless banking channels using mobile phones'.

Social cohesiveness and sense of community

In rural communities in developing countries, it is common for one person or a group of people to own a mobile phone handset and rent it to other community members along with reading and writing text message services.

From a social networking perspective mobile phones have also had a positive psychological impact. Connectivity has allowed families and the diaspora to keep in touch. Anthropologists like Dr Mirjam de Bruijn are intrigued by the way mobile users in developing countries have invented mechanisms such as 'beeping', 'bipage' or 'flashing' as codes to alert someone else to call them. Mobile providers are equally struggling to make money by working around the ingenuity and inventiveness of poor rural people.

How can ICTs help poor rural people?

The focus must be on people and their needs. ICTs need to be appropriate, sensible and meet the requirements of poor rural people so that, as a tool, ICTs can increase their bargaining and purchasing power. The uptake of technology can only be successful if it is demand-driven and responds to the needs of beneficiaries.

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ICTs and more specifically mobile telephony can continue to contribute to further development if:

- we use participatory approaches, as outlined in the examples below, to find out and understand the needs and challenges of poor rural people;
- national poverty reduction strategies systematically include adoption of appropriate ICTs;
- there is a commitment to build the capacity of communities and local organisations to lead and own the process of appropriation; and
- there is a blending of old and new technology to create a three-tier system of public, private and community.

Examples of mobile telephony in action

The following examples show how farmers have participated in identifying and defining their needs, working with donors and other stakeholders to develop mechanisms to harness the power of mobile phones. This participatory approach allowed farmers to actively take part not only in the design but also to take responsibility in implementing the various projects and activities.

SMS Market Information Service, Zambia

IFAD supports the Smallholder Enterprise and Marketing Programme (SHEMP) in **Zambia**. Working with the Zambia National Farmers Union (ZNFU), it identified the need to provide market intelligence to farmers. In August 2006, the programme introduced an innovative, simple and cost-effective way to access commodity prices, using an SMS Market Information Service. To ensure good governance and provide equitable, fair and transparent services, the ZNFU developed a code of conduct outlining the expectations and rules of engagements for farmers, traders, processors, buyers and

[7] See: www.cgap.org

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ZNFU agents. It also provides detailed contact information to report irregularities. The service provides weather information, business news, up-to-date market prices, and lists buyers for 14 major commodities in a cost-effective, accessible and reliable manner. Extension workers also provide additional training and capacity building. For those with Internet access, the system is also supported by a website.[8]

The SMS system is simple to use. To obtain the best prices for a commodity, farmers simply send an SMS message to 4455 containing the first four letters of the commodity name. Within seconds, they receive a text message with the best prices by buyer using abbreviated buyers' codes. To get best prices in a specific district or province, he or she simply includes the province/district code after the commodity code.

The farmers then send a second SMS message with the selected buyer's code to 4455. A text message is sent back with the buyer's contact name and phone number, the company name and address and simple directions for reaching both. Farmers can then call the contact and start trading. The farmers pay US$0.15 for each text message.

This market intelligence system is continuously gaining popularity. It is empowering farmers to negotiate deals by offering time-sensitive information and fostering transparency in pricing. SHEMP and ZNFU continuously update prices on a daily and weekly basis. To ensure sustainability the system is managed by local institutions. They also conduct public advocacy activities to attract corporate sponsorships.

Over 100 traders and processors are now providing weekly price updates. Website visits and the number of SMS messages are continuously increasing. For example, in 2007 between February and June, 520 weekly SMS were exchanged. Between July and August over 1220 weekly SMS message were exchanged. Smallholders today have the necessary information to know what to grow, where to sell their products and at what price.

[8] See: www.farmprices.co.zm

Shu shu shus in Tanzania

Farmers' inventiveness has spearheaded another phenomenon. Poor farmers in **Tanzania** under the First Mile Project are using mobile phones to access market information in real time.[9] Market 'spies' – known locally as *shu shu shus* – investigate prices and what is selling at local markets, and use their mobile phones to report back to their villages. The commodity prices are then transcribed on village notice boards and also broadcast on radio. In partnership with Tradenet.biz they will soon be using mobile phones to access even more market information. This blend of old and new technology is helping farmers build better and more collaborative market chains from producer to consumer.

Making mobile phones universally accessible

A journey of a thousand miles begins with a single step. It does not matter how slowly you go, so long as you do not stop.
Confucius

By now, policy makers and development agencies should have enough evidence that of all ICTs, mobile phones have the best potential to stimulate growth in developing countries – and that investing in mobile services can contribute to both economic and social development. Phone manufacturers and service providers should recognise that the poorest people have turned out to be one of their biggest markets. Mobile telephony has not only helped bridge the digital divide but has been a catalyst to eradicate rural poverty and improve the livelihoods of the marginalised and poor.

To truly make mobile telephony the first universal access ICT there is a need to:

- put in place sound ICT policy in collaboration with government, civil society, private sector actors and consumers;
- invest more in mobile infrastructures and services in rural and disadvantaged areas;
- strengthen the capacity of rural entrepreneurs and farmers' organisations to better exploit the potential of mobile phones;
- deliver relevant and timely content and further develop peer-to-peer information systems;
- reduce both airtime and handset prices; and
- put in place better and enabling regulations to allow mobile services to thrive and expand.

[9] The First Mile Project is supported by the Government of Switzerland and implemented in collaboration with the Government of Tanzania's and the IFAD-funded Agricultural Marketing Systems Development Programme (AMSDP).

"Observations in the field are that mobile phone accessibility is helping to facilitate previously marginalised groups to take a more active part in the economic and social spheres of their communities and beyond."

Finally, to really appreciate the power and potential of this revolution, the mobile sector also needs to capture what official statistics are unable to: the 'informal use' of mobile phones – those sharing a subscription within a community.

Given the conducive environment, it should not be long before the private and public sectors join forces and start producing the US$10 handset – with the vision of producing the US$1 handset and further reducing airtime costs. And yes – this can be done through joint private-public and community partnerships, working to identify community needs and to understand their realities and constraints to build systems that are both profitable and work effectively for those communities.

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REFERENCES

Waverman, L., Meschi, M. and Fuss, M. (2005). *The Impact of Telecoms on Economic Growth in Developing Countries*. London Business School: London

Bhavnan, A., Won-Wai Chiu, R., Janakiram, S., Silarszky, P. (2008). *The role of mobile phones in sustainable rural poverty reduction*. World Bank.

Hammond, A., Kramer, W J., Tran, J., Katz, R., and Walker, C. (2007). *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid*. World Resources Institute (WRI) and International Finance Corporation (IFC).

USEFUL LINKS

IFAD: www.ifad.org

Rural Poverty Portal: www.ruralpovertyportal.org

Tradenet: www.tradenet.biz

Zambia Market Information System: www.farmprices.co.zm

Africa Connect: www.connectafrica.net