Banking on the go

The power of the phone

Cellphones have triggered a wave of technological innovation in the developing world.
In this special report, we examine how they are changing lives for the better

Melissae Fellet

THE cellphone has revolutionised life in the western world. Now, thanks to plummeting hardware prices and homegrown innovation, the developing world is poised to reap the benefits of this game-changing technology.

Take MedAfrica, an app that can be used on almost any cellphone, whether it uses a sophisticated operating system like Android or just SMS messaging. The idea is to provide people in far-flung areas of the continent with medical advice and direct communication with doctors.

Last month, Steve Mutinda and Mbugua Njihia took to the stage at the DEMO conference in San Francisco to ask potential investors for millions of dollars to develop MedAfrica. Njihia argued that it could offer 200 million people reliable, user-friendly and affordable healthcare.

Such lofty goals are commonplace in Silicon Valley. But Mutinda and Njihia are an unusual case: they hail not from California but Nairobi, Kenya.

In Africa, cellphone penetration – the number of phones as a percentage of the population – is still the lowest in the world, but it is growing quickly. In 2010, an estimated 41 per cent of the population on the continent had cellphones, compared with 76 per cent globally. That's double what it was in 2005.

Just as importantly, the number of local developers building software for cellphones is growing too. Innovation labs called mobile development labs, or "mlabs", have opened in Kenya and South Africa as a way to bring burgeoning numbers of developers together. Funded by Nokia, the Finnish government and the World Bank-backed

business development organisation infoDev, the goal of mlabs is to teach programming and business skills, as well as connect young developers with mentors. They help entrepreneurs identify community needs, craft a product and a business plan, and allow for product testing.

The Nairobi mlab, called iHub, has been open for just over a year. In June, the organisation invited

> "We're pushing to create a system where people can benefit from technology on a long-term basis"

developers in Kenya and Uganda to compete for a $25,000 prize to start their business. It received more than 100 entries, including an early version of MedAfrica specifically for use in Kenya. That idea won, springboarding Mutinda and Njihia towards what Njihia told the DEMO conference

could generate $2 billion in revenue in the next five years.

Such initiatives aren't limited to Africa – similar centres are expected to open in Pakistan and Vietnam as well. Firms like Google and Nokia are partnering with the World Bank on these and other efforts to train and nurture budding technologists.

But such centres are only truly successful when the community of entrepreneurs they help to create can stand on its own feet, even in the absence of outside funding, says Oscar Salazar, founder of Citivox, a software platform designed to collect and share data between citizens and their government. "When the money runs out, the project [often] dies," he says. "We're pushing to create an ecosystem where people can benefit from the technology on a long-term basis."

MedAfrica is an example of this. Part phone book and part ❯

‹ basic medical reference text, the app has a symptom checker and lists nearby doctors and hospitals based on the user's location.

It is based on a software platform, called Tuvitu, that Mutinda designed to provide news and entertainment on phones like the Nokia C3, one of the most popular models in Africa. Since 2009, Mutinda has used the platform to build 27 different apps that, as of last month, have been downloaded 700,000 times around the world.

There's plenty of innovation outside the internationally backed mlabs, too. An app called mFarm, developed by a group of female coders from Kenya, connects farmers with current market prices for produce using SMS messages. And Daniel Stern, founder of UConnect in Kampala, Uganda, is working to create an app that provides community health workers with instructions on how to tackle common problems during pregnancy and childbirth.

"It's like the first days of movable type," Stern says. "We are all trying to put together a printing press and we have a sense of mission. We know there's a tremendous need for products yet to be developed, especially in rural areas."

Cassava disease under control

"The cellphone has revolutionised the developing world more subtly than people know"

Beyond developing apps to improve healthcare, agriculture and other aspects of life, the cellphone has also brought with it more rigorous time-keeping.

"The mobile phone has revolutionised the [developing] world much more subtly and profoundly than people really know," says Ethan Zuckerman, director of the Center for Civic Media at the Massachusetts Institute of Technology. People in developing countries used to spend a lot of time waiting for taxis and appointments. Now scheduling apps enable them to organise their time effectively, thus increasing productivity. "The question is: what else can it do?" Zuckerman says.

The answers are myriad. The vast majority of phones in use in the developing world are feature phones like the Nokia C3, rather than the more expensive smartphones. Such phones have limited web-browsing capability, but developers have learned to squeeze huge amounts of performance from them. It is possible to check bank accounts and transfer money over SMS, for example, or even to pop in a specially designed SIM card to gain access to Facebook.

Earlier this year, Chinese telecommunications firm Huawei released an $80 Android phone in Kenya, putting smartphones at a price reachable for many middle-class Africans, says Zuckerman. London-based consultancy firm Balancing Act projects that such price decreases will drive smartphone penetration in Africa from today's levels of between 3 and 5 per cent to between 10 and 15 per cent in the next five years.

With ever-increasing computing power available in cheap, rugged handsets, the rapid growth in cellphone-based innovation is likely to continue apace. Local developers and entrepreneurs are looking for ways to improve quality of life and boost the economy. On the back of their ingenuity will be built the business, economic and infrastructural development that could one day change the face of the developing world. ∎

Smartphones keep an eye on crops

A handful of workers armed with just 10 smartphones could monitor an entire country for crop disease. An app can extrapolate information on disease severity in cassava crops collected at a limited number of sites to the whole of Uganda.

Cassava, or tapioca, is widely used as a staple crop across the developing world as it is resistant to drought. But when disease hits, farmers need to find healthy plants as replacements.

Each year, the Ugandan government sends survey teams into the countryside to measure plant health and bug infestation. Using data from 30 sites, workers map the levels of disease across 80 districts. But it takes five months to produce a nationwide map.

Smartphones could radically speed up the process. John Quinn at Makerere University in Uganda has developed an app that workers can use to record the severity of the crop disease. Their report is linked to the GPS coordinates on the phone and uploaded within minutes to an online map. An algorithm then extrapolates the information across the country.

Workers can also use the phone's camera to take a photo of whiteflies – which spread the African cassava mosaic virus – on the underside of a leaf. Software on the phone then counts the number of bugs.

The software can also estimate the degree to which cassava is infected with other diseases by analysing images of yellow, diseased leaves.

The pilot project, set to begin this month, will involve trained survey teams, but Quinn hopes that untrained farmers will be able to use the app in the future.

JAKE LYELL/ALAMY