



Mobile Apps in Africa

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Mobile applications are beginning to transform African society—economically, socially, and politically. In particular, African software developers are creating and embracing mobile technologies, cloud computing, and social media to address their needs in many areas, including banking, information gathering, farming, healthcare, and education and training. However, in developing such apps, they've had to address numerous IT infrastructure shortcomings in Africa.

Overcoming Limitations

Software developers have to tackle harsh realities in Africa in terms of the mobile phones and services people can afford and the limitations in bandwidth, coverage, and electric power.

Exploiting Feature Phones

Many in Africa can't afford expensive smartphones; they can only afford low-cost "feature" phones, which have become increasingly popular in the developing world. Feature phones occupy the middle ground between basic phones—which simply make and

receive calls and send text messages—and smartphones. They generally have basic GPS, a camera, an MP3 player, limited Internet access capability, and the ability to run simple apps. In 2012, approximately 58.4 percent of global mobile phone shipments were feature phones, and such shipments are expected to be approximately 50 percent in 2013.¹ Data from BuzzCity shows that 85 to 90 percent of the people in Kenya and Nigeria use feature phones.¹

To cater to the large segment of feature-phone users in Africa and other regions, developers must create apps that can be deployed on feature phones and accommodate communication bandwidth limitations. For example, biNu has addressed the bandwidth issue by providing 3G speeds to 2G feature phones (www.binu.com). This app platform runs on a range of mass-market mobile phones and provides fast and affordable access to Web-based apps and popular Internet services. Users can instantly discover, use, and switch between services, change to local languages, and translate almost anything on the fly, without having to download and install separate apps.

Offering Internet Connectivity

Several small-scale trials, based on different technologies, are underway to address the major challenge of providing Internet connectivity to vast rural communities in Africa. For example, in Cape Town, Google is testing wide-area wireless Internet connectivity, linking 10 schools over a TV white-space network. TV white-space network technology provides wireless broadband by tapping into unused portions of wireless spectrum in the frequency bands generally used for television. It provides low-cost connectivity to rural communities with a poor telecommunications infrastructure and can help expand coverage of wireless broadband in densely populated urban areas.

ForgetMeNot Africa has built a platform that lets users of feature phones update their Facebook accounts, send and receive email, and chat over the Internet, using either SMS or via an app (www.forgetmenotafrika.com).

Addressing Power Shortages

To address the limited availability of electric power for charging mobile phones in remote rural areas,

Anthony Mutua from Kenya developed a “shoe charger” that allows the body’s energy to charge a mobile phone. The charger has a thin crystal chip that generates power as the user walks and creates pressure on the crystal. The chip can charge phones via a long cable while the user walks, or store electrical energy for later charging. It can work with any shoe except bathroom slippers and can be transferred to other shoes.

African App Ecosystem

As Africans turn to mobile phones for more online services and demand locally relevant services and content, an African mobile ecosystem has emerged, comprising developers; start-ups; and local businesses, marketers, and retailers. The ecosystem focuses its attention on the customers and their current and future needs. VMK in the Congo, for example, has developed its own app store to cater to the needs of the local population, because some popular overseas app stores don’t accept credit facilities originating from the Congo.

Apps in a few different key areas are helping Africans to improve their livelihood and economy.

Mobile Banking

One important area is mobile banking. The popular M-Pesa money-transfer application from Kenya was launched in 2007 and uses simple cell phones (www.safaricom.co.ke). M-Pesa—“mobile money” in Swahili—has revolutionized day-to-day banking for millions in rural areas who don’t have access to traditional banks. It’s the dominant form of mobile money in east Africa. Its key advantage is that it lets users send money to people, regardless of whether the recipient has a banking account. It’s now used for transactions ranging from money

Column Contributions

We welcome short articles (about 1,500 words) for publication in this column that describe applications of IT (including mobile phones) or discuss IT’s role in emerging markets, outlook for the near future, or issues and challenges for IT. We also welcome your thoughts on and experiences in putting IT to work in emerging markets. For further details, contact the column editor San Murugesan at san1@internode.net.

transfers to paying utility bills and school fees. It’s currently the most developed mobile-payment system in the world, accounting for 80 percent of global mobile transactions.²

The new Pesapal offers more features and payment options (www.pesapal.com). It uses mobile phones to buy and sell goods, and it can send out printable receipts, a payment history, and notifications (via email or text) when payments are due.

M-Shwari, meaning “no hassle” in Swahili, is a new banking platform for savers and borrowers. It lets subscribers of Kenya’s mobile network, Safaricom, operate savings accounts, earn interest on deposits, and borrow money using their cell phones. Subscribers can access instant microcredits of a minimum of 100 Kenyan shillings.

Crowdsourcing

Citizen journalism and reporting and crowdsourcing have become popular, particularly in developing economies. Crowdsourcing platforms are used to perform jobs, improve apps, test websites, and more.

Ushahidi, which means “witness” in Swahili, is an app that lets users gather and distribute information using mobile phones (www.usahidi.com). It was built to report violence during the 2008 Kenyan elections. Using Google Maps and SMS, the app presented a map of violence hotspots. It has since been used globally in other real-time situations, such as the

Haiti earthquake, and has evolved into three related products for democratizing information, increasing transparency, and lowering barriers to sharing stories.

The first product is the Ushahidi platform, which is a free, open source tool that users can download to crowdsource information using multiple channels, including SMS, email, Twitter, and the Web. It also provides rich information-mapping tools, so users can visualize the gathered information on a map.

Next is the SwiftRiver open source platform, which provides access to tools for filtering and making sense of real-time information (www.usahidi.com/products/swiftriver-platform). It helps you filter and verify real-time data from channels such as Twitter, SMS, email, and RSS feeds, and it lets you curate and analyze real-time data on any topic of interest. It can also help users discover nascent relationships and trends in datasets. It can automatically categorize and classify information based on keywords.

The third product is Crowdmap (www.usahidi.com/products/crowdmap), which is a hosted version of the Ushahidi platform. You can set it up in a couple of minutes to crowdsource information.

U-report is another app, developed by UNICEF Uganda and launched in May 2011, that’s revolutionizing social mobilization, monitoring, and response efforts (www.unicef.org/infobycountry/uganda_62001.html). This free, SMS-based system lets Ugandans



Figure 1. A Ghana farmer using apps on his feature phone. (Photo courtesy of Audience Scapes; www.audiencescapes.org.)

speak out about what's happening in communities across the country. It also lets them work with other community leaders for positive change. By sending the text message "join" to a toll-free number and submitting a few personal details, anyone with a mobile phone can become a volunteer "u-reporter" and share their observations and ideas on a wide range of issues. The u-report project in Uganda has built a community of over 90,000 youths using SMS to inform other Ugandans to take action on issues of shared concern.

Farming

Helping farmers in Africa produce more will be key to lifting millions of Africans out of poverty and sustainably feeding them and the rest of the world. According to the Forum for Agricultural Research in Africa (www.fara-africa.org), farmers in many parts of the world use newer technologies and better farming practices than farmers in Africa, helping them better address infertile soil, drought issues, plant diseases, and other limitations and produce higher yields.³ Experts believe data sharing and giving farmers, scientists, and entrepreneurs access to salient agricultural data that's easy to use—not just by humans but also by machines—will

help farmers address the problems they face and lift them out of poverty.³ Farming data include plant genomics, local weather conditions, rainfall levels, information on the best crops for a given soil type, information about pests and diseases, and anticipated prices at local markets (see Figure 1).

Examples of helpful apps include

- *M-Farm*—which was founded in Kenya in 2010 and provides up-to-date market information to link farmers and buyers through a marketplace and to report on current agricultural trends (<http://mfarm.co.ke>);
- *iCow*—a popular mobile app that helps dairy farmers manage their cows more sustainably (www.icow.co.ke); and
- *Farm Radio*—a program that helps more than 400 radio broadcasters in 38 African countries meet the needs of local small-scale farmers and their families in rural communities (www.farmradio.org).

Other useful tools include a country-specific multilingual app that gives agricultural advice to small farmers and an interactive tool that provides high-resolution maps of water resources and water-related risks or disease-affected areas.

Healthcare

Africa faces big challenges in providing quality healthcare to its people, particularly those who are poor and living in rural areas. Mobile health (m-health) services and hospital information systems could help address the health problems. Using a mobile phone, m-health applications can provide information about health in general, connect patients to qualified doctors, remind patients to take their medication, help them locate the closest clinic, transmit tests

and lab results from local clinics to doctors and hospitals, and provide counseling. Mobile phone apps give people in poor countries increased access to healthcare and open up a new frontier to improve patient care in rural areas and developing countries.⁴

Open Hospital (<http://openhospital.info>) is a small, open source information system that helps manage daily operations in small rural hospitals—operations such as registering patients, monitoring outpatient department visits, facilitating admissions and examinations, managing the pharmacy and bills, maintaining the vaccine database, supporting internal communications, and generating reports and statistics. It was developed to support St. Luke Hospital in Uganda but is now deployed in several other rural hospitals in developing countries. It was developed by volunteers at Informatici Senza Frontiere (www.informaticisenzafrontiere.org/en), a nonprofit organization founded in 2005 by a group of Italian managers working in the IT sector who wanted to use IT to provide practical help to those who live in poverty.

Education and Training

Education and skills development is key to boosting Africa's socioeconomic status and to improving its quality of living and competitiveness with other nations. Although most children in Africa don't have access to books, digital technology can change this. In particular, the nonprofit organization, Worldreader, is giving kids in the developing world access to digital books (see Figure 2). Using e-readers and mobile phones, it lets children and their families access thousands of local and international e-books. As of May 2013, Worldreader had distributed over 609,000 e-books in sub-Saharan

Africa (www.worldreader.org/what-we-do). It's also running projects in Ghana, Kenya, Uganda, and Tanzania.

The "Skills for Africa" program, launched by SAP Africa, aims to develop information and communications technology skills in Africa. The program promotes education and entrepreneurship and is designed to meet the complex needs of African skills development to ensure ease of use and learning in challenging environments.

Last year, SAP launched its Social Sabbatical program to help create skilled jobs and support employee learning and innovation. In this program, successful SAP employees from across the globe contribute their time and talent to mentor entrepreneurs and small businesses in emerging markets and support underserved communities in South Africa, Brazil, and India.

Mobile apps will continue to change the lives of people around the world, and several trends are aiding this transformation—advances in mobile technologies, the development of novel applications of value and relevance to people, the integration of mobile apps with back-end information systems, the continued growth in coverage of mobile cellular networks, the willingness of enterprises (both domestic and global) to deploy the necessary IT infrastructure and apps at affordable cost, and

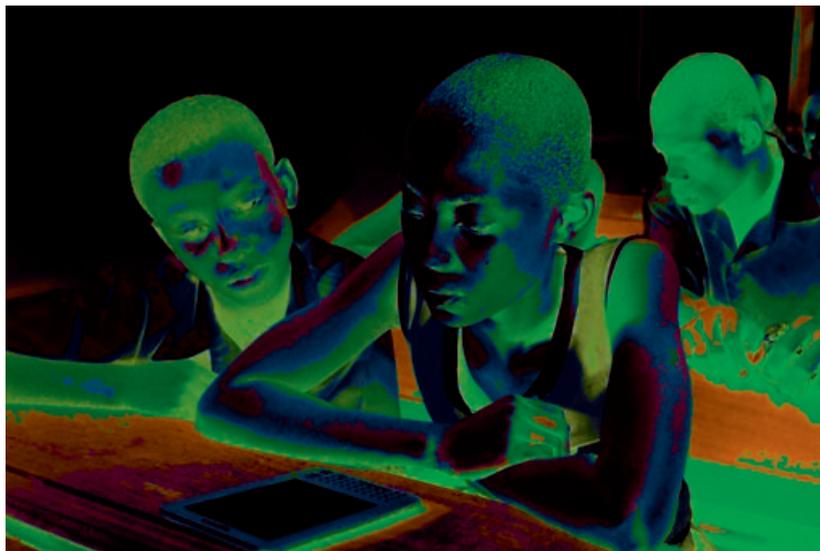


Figure 2. Junior-high-school students concentrating on their e-readers. (Photo courtesy of Worldreader; used with permission.)

increased user adoption of mobile apps. There are a few challenges that need to be addressed to realize the full potential of mobile apps, but stakeholders seem willing to address them.

IT professionals, educators, researchers, businesses, community organizations, and government agencies in Africa and elsewhere can—and should—make a difference by harnessing IT's power to address the problems of billions of people in the bottom of the pyramid in developing countries. ■

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