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Silicon Savanna: Mobile Phones Transform Africa

By Alex Perry / Nairobi

The buzz at Pivot25, a conference for mobile-phone software developers and investors held this June, is all about the future of money. Ben Lyon, the 24-year-old business-development VP of Kopo Kopo, wants \$250,000 to produce his app for shops to process payments made by text message. Paul Okwalinga, 28, describes his money app — called M-Shop, it allows you to buy travel tickets and takeout via mobile phone — as "not reinventing the wheel but pimping it." Kamal Budhabhatti, 35, claims Elma, the latest product from his company Craft Silicon, lets a phone do and be almost anything financial — act like a credit card or an online bank (a "digital wallet," he says), trade shares or forex, organize a company's payroll and (incidentally) surf the Web and phone home. Cash suddenly seems very old. The previous week, Joe Mucheru, a senior manager at Google, declared credit cards prehistoric. Adding to the giddy mood is the thought that the inventions on display might make some lucky Pivot25ers gazillionaires. And where are these extraordinary futures being imagined and plotted? The giraffes and zebras grazing in the game park outside rule out Silicon Valley, Seattle and Bangalore. Try Nairobi.

Cell phones have taken all the world forward, but they are positively transforming Africa. Lack of infrastructure — few hospitals, landlines and roads; little power, education or running water; small banks; sparse insurance; tiny stock exchanges — is a large part of what economists mean when they say *poverty*. And much of Africa is a giant, dark infrastructural void, as anyone who has flown over the continent at night can attest.

[See pictures of the cell phone's history.](#)

The arrival of the mobile phone changed that forever. For the first time, hundreds of millions of people found themselves on some sort of grid, one that allowed them to talk to one another and the world. The take-up was astonishing. From almost none a decade ago, there are now half a billion mobile phones in Africa, roughly one for every two Africans, according to industry analyst Informa Telecoms & Media. The economic effect has been just as dramatic. According to studies by the London Business School, the World Bank and consultants at Deloitte, for every 10 additional mobiles per 100 Africans, GDP rises 0.6% to 1.2%. "Mobile tech has the fastest adoption rate of any technology in the world," said Miguel Granier, founder of Boston-based technology and development fund Invested Development, who was attending Pivot25. "For rapid, catalytic growth, it's the biggest opportunity there is."

But this is not a story merely of how technology is changing Africa. Africans are changing technology right back. They now use text-message networks to send e mail, run social networks (South Africa's MXit) and even verify from a bar code whether a drug is genuine or fake (mPedigree in Ghana and Sproxil in Nigeria). Africa's influence on global technology is most marked in mobile banking: with its M Pesa service (*M* for mobile, *pesa* meaning money in Swahili), Kenyan operator Safaricom became the first-ever telecom company to create a mass mobile-banking service, setting industry standards now being copied from California to Kabul.

[\(See pictures of office cubicles around the world.\)](#)

Africans, and Kenyans in particular, are making their presence felt online too. When Kenya erupted in violence in the aftermath of a disputed general election in late 2007, a handful of Nairobi code writers created Ushahidi (meaning testimony in Swahili), a data-mapping platform to collate and locate reports of unrest sent in by the public via text message, e mail and social media. The idea was simply to find out what was happening. Says Ushahidi co-founder Juliana Rotich: "The TV was playing *The Sound of Music* while we could see houses burning in our neighborhood." But the desire to know what's going on turned out to be universal, and Ushahidi quickly became the world's default platform for mapping crises, disasters and political upheaval. According to Rotich, by May of this year, Ushahidi, which is free to download, had been used 14,000 times in 128 countries to map everything from last year's earthquake in Haiti to this year's Japanese tsunami and the Arab Spring.

Ushahidi's creation was all the more remarkable for coming at a time when bandwidth in Kenya was some of the thinnest in the world. In 2007 just one fiber cable only partly connected sub-Saharan Africa to the world, and most of the continent logged on via satellite, which is expensive and slow. In the past two years, however, six more cables have arrived, linking the region to the U.S., Europe and Asia, and by 2013 that number will be 12. Tim Parsonson, CEO of African data-center operator Teraco, says that in the past four years Africa's Internet capacity soared from 340 gigabits to 34,000 gigabits per second while the cost of the Internet to its service providers plunged from \$4,000 to \$200 per month for a megabit per second and could fall still further, to \$100, within a year.

[\(See TIME's internet covers.\)](#)

As a result, Internet traffic in Africa is among the fastest growing in the world. "This is a tidal wave of activity crossing the continent," says Ben White, a blogger and the founder of VC4Africa, which connects African tech entrepreneurs with mentors and financiers. Google says online advertising in 2010 saw 5.2 billion clicks on African sites vs. 3.7 billion in Western Europe. "The pace is amazing. It's lightning speed," says Mucheru, who heads Google's sub-Saharan Africa office. The Web's economic effect echoes that of mobiles: a 2009 World Bank study found every 10% rise in high-speed connections raises growth by 1.3%.

Just as African bloggers have joined the global conversation, Africa's tech developers are joining the global marketplace. The next killer piece of code is as likely to be written in Africa as anywhere else. Amazon's revolutionary cloud-computing platform, which allows users to rent varying amounts of virtual computer capacity on which to build applications, was developed in Cape Town. Parsonson, 42, whose Teraco built three data centers in two years in South Africa and is erecting two more in Nigeria and Kenya, says he is witnessing an online explosion faster and bigger than at any other time in the Web's short history. "There is," he says, "a lot going on."

[See pictures of China's investments in Africa.](#)

Silicon Savanna

On the second day of Pivot25, Bitange Ndemo, Permanent Secretary of the Kenyan Ministry of Information and Communications, dropped a bombshell. In conversation with a panel of Kenya's tech luminaries, he said construction on the new \$7 billion Konza Technology City outside Nairobi should start toward the end of the year. "We are building the infrastructure," said Ndemo. "Now it's time for content and applications." To that end, he added, "we, the government, are going to shock you."

In the first week of July, Kenya's government will become the first in Africa — and one of the first in the world — to be completely data open. It will release online millions of pages of previously internal, often secret government documents. "All the data you want, you'll find it there," said Ndemo. He described the initiative in terms of allowing a government that faces a general election next year to demonstrate service delivery as well as to have a legacy project for President Mwai Kibaki, who is not expected to seek re-election. But the implications of such radical transparency for a government frequently ranked among the most corrupt in the world are immense. In an interview, Ndemo agreed that open government will "completely change the way the government deals with the public and will strike a huge blow against corruption. There has been some resistance — the Planning Ministry refused for a whole year to give us their data — but we have convinced them."

[\(See: "Kenya's Banking Revolution."\)](#)

As the most developed country on the continent, South Africa is the obvious hub for online Africa. And yet when Google was looking for a regional base, it went first to Nairobi. Why? Because Kenya — notably its government and specifically Ndemo — embraced the Internet as few other nations have. Unlike other African regulators, who often see protecting state telecom monopolies as their duty, Ndemo was an early and enthusiastic liberalizer of telecoms and fiber networks and was instrumental in Kenya's decision to lay its own national undersea fiber cable when talks on a regional link failed. Ndemo says the state's ultimate aim is free mobile calls and e mail for every Kenyan who wants them, which he estimates at 60% to 80% of a population of 40 million. The driving principle behind his digital zeal, says Ndemo, is that "the Internet is a basic human right" and a necessity for economic growth.

Kenya's love for IT has earned it the nickname Silicon Savanna. The moniker neatly encapsulates the themes of its rising influence on global technology: mobile and rural and filling some wide-open spaces in infrastructure and democracy. Pivot25, for example, is exclusively focused on mobile-phone apps because it's becoming clear that mobiles are how the developing world connects to the Web. Half of all Africans — and 92% of Kenyans — go online through a mobile phone. (Not many expect to graduate to a desktop. No African manufacturer makes standard computers, but already two — one in Nigeria, one in the Republic of the Congo — are building tablets.)

[\(Read "In Kenya, Land Reform Worries Both Rich and Poor."\)](#)

The rural theme is also evident at Pivot25. The Mobile Crop Disease Surveillance app, for example, is a real-time alarm system run on text messaging. Another app, M-Farm, allows farmers to use texting to price their produce correctly, pool buying and selling power and keep in contact with suppliers and buyers. Ushahidi co-founder Erik Hersman, who also set up the iHub and m:Lab tech centers in Nairobi and organized Pivot25, argues that producing apps for an African farmer's cell phone, often an old, basic model, may not only be necessary to address the Kenyan market but also be a recipe for worldwide adoption. "Any of these apps can go global," he says. "They work on any phone anywhere. In a sense, Africa is the best testing ground for new stuff. If it works here for the guy on his Nokia 1100 [a basic GSM mobile and the world's most popular phone, with more than 250 million sold since 2003], it'll work for anyone."

Even if an African Angry Birds (run on SMS) is in everyone's future, the influence of Africa's technologists may be most keenly felt close to home. As debilitating as Africa's lack of infrastructure is its democracy deficit, and the two are often related. Historically, the continent's dictators showed scant concern for giving their people the basic tools they needed to get on in life, not least because political ambitions evaporate as simple living becomes harder. So perhaps it's natural that, like Ushahidi and Kenya's open-data initiative, much of Africa's tech innovation has an activist edge. Twaweza and Uwezo in Tanzania and Kenya are merely the most prominent of scores of new African Web-based campaigns for state transparency and accountability. Ory Okolloh, 34, another of Ushahidi's co-founders and a Google policy manager, says, "The Internet doesn't care who you are. People are accessing the Internet for free without having to be from the right family or tribe or paying a bribe. There is a liberating aspect to that that gives it an edge." VC4 Africa's Ben White says, "The more people connect, the more they know people who also think infrastructure and government support are missing. That's when people start demanding services and — when they do not get them — you get situations like Egypt."

[\(See the battle over Kenya's new constitution.\)](#)

That prospect is already prompting some repressive governments to pull the plug. In April, during opposition protests against President Yoweri Museveni, Uganda ordered Internet service providers to block access to Facebook and Twitter, where much of the dissent was organized. That month Swaziland also reportedly suspended access to Facebook in the face of protests. In June, Rwanda blocked the Umuvugizi

website as a court found its editor guilty of insulting President Paul Kagame. And journalist groups say Sudan and Tanzania, which has a version of WikiLeaks in JamiiForums, use Chinese-style malware to damage user systems and delete content. More-enlightened leaders make the new channels work for them. The eventual winner of Nigeria's presidential election in April, Goodluck Jonathan, announced his candidacy on Facebook.

It is surprises like that — a politician entering a presidential race via social media — that reveal the true significance of Africa's rapid entrance into the technology business. It defies stereotypes, overturns perceptions. Says Ushahidi's Rotich: "When I speak in Europe or the U.S., people are shocked. I'm a woman, I'm not begging for money, and I'm not showing them pictures of abject poverty. Ushahidi is jarring for people. It complicates their view of Africa. Ushahidi is cool. I think that's good. I think maybe through tech, people are just beginning to work out just how cool Africans really are."

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