

RESEARCH PAPER BY RICHARD ATTIAS & ASSOCIATES

PLENARY SESSION      Scheduled for: August 29, 16:45

## THE DIGITAL REVOLUTION

**We have an abundance of genius; we just need trust and support!**

### Session overview

Broadband access in Africa is modifying all sectors of the African economy, and triggering a radical transformation of society, from mobile banking, to healthcare diagnosis apps. Implementing new technologies is one of the top investment priorities for African CEOs – so represents a huge opportunity for African entrepreneurs and start-ups as well as international players.

### Regional challenges

ICTs have been touted as the magic bullet to solve all sector problems in Africa, from healthcare to agriculture. In 2013 there were 167 million Internet users in Africa - a 16% penetration rate on the continent (*McKinsey, 2013*). McKinsey forecasts that in the next decade this will increase to almost 50% of the population and that the Internet could contribute to \$300 billion to Africa's GDP growth (*McKinsey, 2013*). However, both mobile and fixed high-speed broadband Internet penetration rates vary considerably by region, demographic and geographic area. Urban residents, highly educated, and young people aged 18-34 years old have higher rates of Internet access (*Pew Research Center, 2015*). While tremendous potential for Internet-driven GDP growth exists, there remains work to be done.

The World Bank argues that the biggest obstacles to Africa realizing its Internet growth potential lie in the private sector's inability to reach a strong consumer base and too little cooperation between mobile companies. Affordable service and digital literacy serve as a foundation for the private sector to thrive (*World Bank, 2012*). Lack of infrastructure, nonexistent ICT strategy, and limited financial capital also contribute to stunted growth. Governments need to fix all of these problems to build a competitive ICT industry that will promote innovation. UNESCO reports that approximately 140 countries have developed a national high-speed broadband plan, to introduce measures that ensure digital inclusion

and affordable, reliable access to high-speed broadband. Despite this progress, 43 countries, 14 of which are African, do not have any plans in place (*UNESCO, 2014*).

Deploying broadband infrastructure remains one of Africa's biggest challenges in providing affordable and reliable, universal Internet access. Out of the two types of broadband, fixed and mobile, mobile broadband is projected to grow the fastest. The ITU notes that mobile broadband subscriptions grew at a rate of 40% between 2011-2014. It projects this growth will continue. Mobile cellular penetration in 2014 was at 69% in Africa (*ITU, 2014*). Fixed broadband penetration, on the other hand, grew slowly, and is projected to drop. In 2014, Africa had the lowest fixed broadband penetration of any region at 0.4%, compared with 28% in Europe, 17% in the Americas and 8% in Asia and Pacific (*ITU, 2014*). According to UNESCO, many countries are committed to deploying fiber-based, fixed broadband access networks because of the high speed potential and durability. Yet such infrastructure is costly and would require huge investment, which neither the private sector nor the government can finance alone.

Growing at 20% globally in 2014, mobile broadband (3G and 4G) had the highest growth rate of any ICT (*UNESCO, 2014*). Universal broadband is the UN's long-term goal, but for broadband to be universal it needs to be 100% available, affordable and fast, although the UN has not defined a universal broadband speed. More importantly, broadband is very expensive for residents of developing countries. In 2013, fixed broadband was 32.2% of average monthly incomes in developing countries (*UNESCO, 2014*). Mobile ICTs aim to bridge the digital divide by providing affordable and reliable Internet access and leapfrogging the need for fixed broadband.

Governments that implement national ICT strategies and introduce digital public service initiatives will provide the foundation for increased growth in mobile broadband. However, national Internet strategy including broadband and the deployment of ICTs needs to be tailored to local markets (*World Bank, 2012*). Government agencies, consulting firms and nongovernmental organizations foresee the largest social and economic impact in sectors including health, education, agriculture, financial services and government. As more mobile subscribers access the Internet, the ability for providers to handle massive amounts of data will be the continent's next big challenge.

## ICT penetration as a solution to development problems

### Health Care

ICTs can improve healthcare on a national scale by connecting national hospitals with smaller health clinics to provide digital health records. This can enhance patient care by ensuring clinicians know patients' health histories and can later report data for national digital health records. On a macro scale, massive data collection can help governments gather better health statistics for reporting purposes, which may help prevent epidemics (*UNESCO, 2014*). ICTs can also facilitate preventative care, by

allowing citizens to self-educate about health problems including diabetes, parasites and other diseases, and to practice good hygiene. Finally, ICTs may act as virtual training for workers in remote areas and allow them to liaise with doctors at larger hospital centers. McKinsey estimates that the benefits from technology in the health sector could range between \$84 billion to \$188 billion (*McKinsey, 2013*).

## **Education**

Shortages of teachers, books and materials can prevent students from accessing basic education. Both broadband and ICTs can bridge education gaps by providing essential technology training for primary school students and teachers. Blended classrooms that include both in-person instruction and tablet or enquiry-based learning and multi-media lessons have countless success stories. For example, technology specifically helps elementary and secondary girls obtain literacy and STEM skills - a demographic that has statistically fallen behind in classrooms in some regions.

UNESCO reports illustrate that ICTs also improve teacher competencies, knowledge and enhance their curricula. However, training programs need to be supported by the government and NGOs. UNESCO implemented a four-year project in eight sub-Saharan African countries where it created teacher-training institutes that used ICTs and mobile learning. Its objective was to train teachers in pedagogy and support teachers' professional development. It found that it had a high success rate. In addition, ICTs can facilitate the standardization and monitoring of school performances through data collection in the same way that it can for the healthcare sector (*McKinsey, 2013*).

## **Climate and Environment, Humanitarian Relief, Mobile Finance and Agriculture**

GPS, GIS, satellites and meteorological stations can be used to measure climate change and scientists and other actors can use these to manage climate risk and mitigate its impacts. ICTs can also act as early warning systems for potential events related to climate change (*World Bank, 2014*). Open source software including Ushahidi and Shana have facilitated massive rescues during natural disasters. Mobile banking has been another area with substantial growth over the past decade. For example, Africans with limited credit may take out micro-loans to start small businesses or finance large purchases. Very few Africans have access to banks and mobile money allows individuals to save money, accrue interest and send remittances overseas.

Experts forecast that agriculture has some of the greatest potential for reducing poverty out of any of the above-mentioned sectors. ICTs can act as extension programs, providing farmers with essential information on weather, market trends, and tips on crop selection, pest management and fertilizer (*World Bank, 2014*). In addition, mobile devices allow farmers to buy micro-insurance for their crops and use virtual trading platforms to purchase inputs. Other apps provide livestock tracking for farmers. On a

global scale, platforms can provide traceability of the agricultural value chain, increasing food security and safety worldwide.

### Solutions/recommendations from UNESCO, World Bank, McKinsey

- Policymakers and regulators should encourage investment and ensure sufficient availability of quality and take into consideration the needs of different services.
- Governments should encourage public-private partnerships to build capacity and ensure equitable access to technological innovations (*UNESCO, 2014*)
- Governments should help with direct infrastructure investment by enabling a liberal market, including issuing licenses and auctioning spectrum (*World Bank, 2014*)
- Governments should also reduce taxes and import duties on telecommunication/ICT equipment and services to boost levels of ICT uptake (*UNESCO, 2014*)
- Governments should review frameworks for intellectual property (IP), which can facilitate digital innovation, protect content creators and ensure the health of the broadband ecosystem (*UNESCO, 2014*)
- Governments must develop an ICT strategy that takes into consideration local market realities and differences in local consumer base and markets (*World Bank, 2014 and McKinsey, 2013*)
- Governments should collaborate with the private to create a national strategy and commit to building ICT capabilities. PPPs will also reduce capital risk (*McKinsey, 2013*)
- Entrepreneurs should look for support from incubator communities and angel networks while Africa's tech sector develops (*McKinsey, 2013*)
- Policymakers and donor communities should develop multi-country cooperation and best practices for ICTs (*World Bank, 2014*)
- Investing in tools and infrastructure and developing open data policies will support the sharing of knowledge (*World Bank, 2014*)

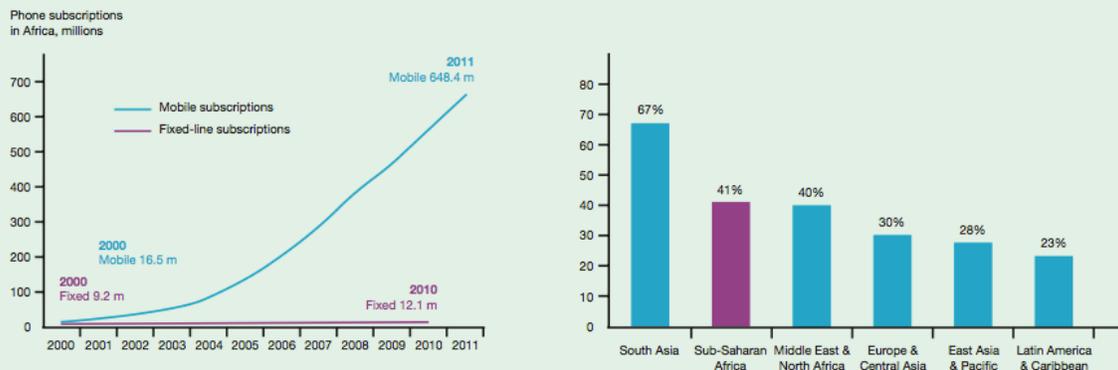
### Forum Flashback:

**NYFA 13:** Alain Ba Oumar, CEO Internet Gabon, said that governments had an obligation to provide quality services including internet. Francois Locoh-Donoh, Senior Vice President, Global Products Group, Ciena forecast that the cost of broadband would go down over the next 5-10 years (a prediction that has proved correct so far).

Figure 1.2

### Africa's mobile revolution

Mobile phone and fixed line subscriptions in Africa, 2000–2011 (left chart) and average mobile growth rates by region (right chart).



Source: World Bank, Wireless Intelligence and ITU.  
Note: Regions in the right chart include developing countries only.

Figure 1 World Bank

#### Additional reading:

CNN, Doctors develop apps for front-line health workers <http://cnn.it/1Mcqox4>

WIRED, "Mobile Money: 4 Services Tackling Wealth Inequality in Africa" <http://wrd.cm/1Lxe4e5>

Phone app to give Kenyan farmers info on best seeds for changing climate conditions:

[http://allafrica.com/c/-5\\_BNT](http://allafrica.com/c/-5_BNT)

IT News Africa, "Wi-Fi propels growth in Africa" <http://bit.ly/1J4JUOj>

Mail and Guardian, Senegal becoming Africa's tech hub <http://bit.ly/1BpRv7o>

FT: Africa leads the global pace in adoption of mobile phones and new technology

<http://on.ft.com/1JTqwnS>

The Economist, "Safaricom fights to maintain dominance in Kenya telecom market"

<http://econ.st/1HQpmXW>

The Wall Street Journal, "Africa Makes Leap in Cross Border Payments" <http://on.wsj.com/1Jj1u02>

Le Figaro, "L'entreprise télécommunication, Orange, négocie 4 filiales d'Airtel en Afrique"

<http://bit.ly/1gOdBXR>

The Battle Between Mobile Phone Companies is a Boon for Financial Inclusion" <http://bit.ly/1D1VKXA>

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