The Internet Economy in Africa

Harnessing the power of the internet, a challenging policy priority

In recent years, Africa's mobile and internet markets have seen significant growth, particularly in markets where public private partnerships, healthy competition and open access to information flourish. However, Africa's Internet potential is large and untapped. The continent makes up 15% of the world's population, but only 6% of the world's Internet users; Internet penetration in Africa tends to be low relative to regions of similar income levels. In this context, policy makers must continue to act as enablers of market conditions, catalysts for equitable service delivery, protectors of consumer rights and privacy as well as champions for the social, economic and job creation impacts that can be achieved.

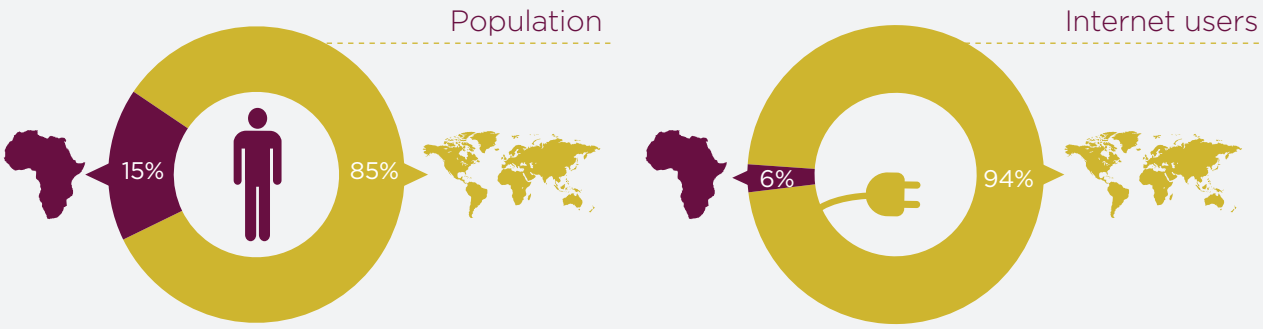
Dalberg

COPENHAGEN | DAKAR | GENEVA | JOHANNESBURG | LONDON | MUMBAI | NAIROBI

NEW YORK | SAN FRANCISCO | SANTIAGO | WASHINGTON DC

Harnessing the power of the Internet, a challenging policy priority

The World Bank has found that a 10% increase in broadband penetration is correlated with a **1.38% increase in GDP** in low and middle income countries[1]



Around the world, the Internet is proving to be a dynamic tool for **stimulating economic growth**. The World Bank has found that a 10% increase in broadband penetration is correlated with a **1.38% increase in GDP** in low and middle income countries[1]. Further, they note that, in Africa, mobile technology and policies of liberalisation stimulated **$56 billion in private sector investment between 1998 and 2008**[2]. The resulting economic growth can increase overall welfare, expand access to higher quality goods and services and create new jobs.

In addition to promoting broad-based economic growth, the Internet is also providing **opportunities to innovatively pursue social and developmental objectives**. Internet penetration is connecting remote populations to markets and strengthening the overall efficiency of service delivery in areas such as health, education, livelihoods and financial inclusion as well as creating access to government services for the most marginalised populations. Understanding these social impacts of the Internet will help policy makers better utilise it to transform lives.

Whether the Internet's potential to drive both economic growth and social outcomes is realised will be significantly impacted by policy choices. Those choices must respond to three key challenges, namely:

- **Developing appropriate policies and investment plans** to promote growth and innovation whilst appropriately protecting consumers
- **Keeping pace with the new requirements** of digital information and the set of industries that emerge in order to take advantage of new opportunities
- **Managing digital inclusion** and ensuring that the Internet is made available across geographic and demographic boundaries.

Navigating these challenges is not easy, and there is **much that can be learned from others** that have taken different approaches to harnessing the power of the Internet to drive economic growth, job creation and social outcomes.

What follows is an overview of the ways in which the Internet is driving socioeconomic impact and illustrative examples of how government – through principles of openness and transparency – can play a catalytic role in realising this impact.

1. Qiang, C. Z. W, World Bank. "IC4D: Extending Reach and Increasing Impact," Economic Impacts of Broadband, 2009. Chapter 3.
2. World Bank, Transformation Ready: Using ICT to Fast Track Africa's Development Path.", p.2

Characterising socioeconomic impact

"The Internet is based on a layered, end-to-end model that allows people at each level of the network to innovate free of any central control. By placing intelligence at the edges rather than control in the middle of the network, the Internet has created a platform for innovation" Vinton Cerf, computer scientist and Internet pioneer

The socioeconomic impact of the Internet is being driven by rapid innovations in **systems, applications and services** that are being developed across the public and private sectors. These new innovations are **changing the way that socioeconomic goals are achieved**, such as equitable access to healthcare, quality education and financial services.

Looking across a range of socioeconomic areas there are a number of **"impact areas"** where we see the Internet having a transformative effect.

Information Management	The **National Health Insurance Fund** in Kenya digitises member records and has created an online portal for hospitals reducing the human capital costs of processing claims by 53%, allowing them to expand coverage to secondary care facilities
Communications Awareness Marketing	**Young Africa Live** is a mobile web portal in South Africa that uses news, entertainment and social networking to promote awareness of HIV/AIDS and sexual health amongst young people. Since its launch in December 2009, YAL has attracted over 1 million unique visitors in South Africa and has since been launched in both Kenya and Tanzania
Supply Chain Management & Procurement	**Esoko**, which provides market information and supply chain management tools directly to customers, is used by smallholder farmers in 16 African countries. It is estimated that its services have raised farmer livelihoods by an average of 10-13%
Service Delivery	Safaricom's **Daktari 1525** will allow over 18 million users to call and talk to expert doctors 24 hours a day, 7 days a week. Other countries, like Nigeria (Dokitasays.com) are trying similar types of services but have yet to reach similar scale
Research & Development	The **Fab Lab** at University of Nairobi is a collaboration with MIT that is currently supporting 15 product innovations. The lab relies on the internet to access online journals, locate new sources of overseas funding and build partnerships with universities that enable them to utilise equipment not available locally
Financing	**Kilimo Salama** allows smallholder farmers to insure agricultural inputs using a weather-based index model, relies on digital networks and mobile technology and is currently providing insurance to over 65 000 farmers across Kenya and Rwanda
Leadership & Governance	The Ghana **Open Data Initiative** is in the process of uploading 3,000 data sets as well as building out 140 citizen applications that will use and increase awareness of information contained in this data

[SOURCES: Interview with Marwa Chacha, September 12, 2012; Praekelt Foundation Blog 'Young Africa Live Reaches 1 million Users' http://blog.praekeltfoundation.org/post/27976880410/yal-reaches-1million; www.esoko.com; Deloitte: Digital Villages: Building networks and connections, 2012; Interview with Kamau Gachigi, September 10, 2012; http://kilimosalama.files.wordpress.com/2010/02/kilimo-salama-fact-sheet-final11.pdf; http://techloy.com/2010/05/10/dokitasays-ask-real-health-questions-answers-by-real-doctors/; http://www.cio.co.ke/news/top-stories/Safaricom-unveils-mobile-health-service; http://data.gov.gh/; http://www1.ifc.org/wps/wcm/connect/e0ed35804c33fc309479def12db12449/KS+story.pdf?MOD=AJPERES]

Across socioeconomic areas such as health, education, energy, transport, financial inclusion, agriculture, SME development and government services the Internet is transforming how information is stored, communications happen, supply chains are managed, and services are delivered. However, innovation and impact across these sectors is emerging at varying rates and facing a diversity of challenges. **Deepening an understanding of the nature of these impacts** and the role of governments in enabling progress can create a powerful platform for learning across countries about what works and what doesn't.

A preliminary review of over 300 internet enabled systems, applications and services and interviews with experts, entrepreneurs and policy makers across Kenya, Ghana, Senegal, and Nigeria suggests that the opportunities and challenges to driving impact in each sector are unique and will require a range of actions from public, private and civil society actors in order to realise full potential. The examples below provide a set of preliminary observations about the state of the internet's impact on health, agriculture and financial inclusion.

Healthcare: mHealth and eHealth models focused on improving access, efficiency and affordability of healthcare have been rapidly emerging across Sub-Saharan Africa over the past few years. With 25% of African countries having a National eHealth Strategy or Policy[3], national leadership is also emerging. However, despite the move towards national alignment and ownership, countries are still struggling to move from policy to implementation and pilots are still struggling to move from start-ups to scale.

Financial inclusion: The transformational impact of M-PESA on Kenya's economy is well known, but despite the emergence of over 50 mMoney deployments as well as a range of epayment solutions, most platforms are struggling to achieve critical mass. Nonetheless, mobile and electronic payment platforms are already surging ahead to expand service delivery both within financial services and beyond. For example, MFS Africa is working with MTN Mobile Money in Ghana to deliver consumer credit, savings and life insurance products for lower income customers. And beyond traditional financial services, m-Kopa Solar in Kenya is leveraging payments to provide asset financing for affordable solar-powered lighting solutions while Changamka is using payments to manage health savings accounts for its customers.[4]

Agriculture: Two-thirds of Africans are reliant on agriculture as a primary source of livelihood, yet due to inefficiencies across the value chain including lack of accurate information and high transaction costs, farmers, traders and buyers are unable to effectively operate[5]. Internet enabled solutions are addressing value-chain inefficiencies and in some cases, tangible impact is starting to emerge. For example, a study of 600 farmers using Esoko in Northern Ghana saw a 10% increase in revenue following the receipt of market prices and solutions such as DrumNet in Kenya are reducing transaction costs and increasing income by a reported 32%[6]. But despite these early indications of impact, agricultural solutions continue to face a range of challenges including building sustainable business models, ensuring optimal infrastructure for growth and managing limited availability of ICT skills.

Below is a collection of examples of systems, applications and services at differing levels of development that aim to drive impact across a range of socio-economic areas.

IMPACT AREAS

	Health	Education and labour force	Financial inclusion	Industry (e.g. agriculture, SME)	Energy and transport	Government public service
1 Information management	AMREF, hp	INFOMISTER, Agile	GHAMFIN, Ecobank	esoko, BusinessGhana		NHIF
2 Communications, awareness, marketing	YOUNG AFRICA LIVE	K12	Stanbic, microcred	Manobi, NOKIA Connecting People, Agrosmart, iCow	KBS Kenya Bus Service Management Ltd	ICT Master Plan, Vision 2030
3 Supply chain management & procurement	Pedigree, SPROXIL	Ummeli, JobsGhana	EQUITY, ACCION	I-Farm, connecting farmers, Alibaba.com	GHANA NATIONAL WOOD TRACKING SYSTEM	
5 Service delivery	Ushahidi, WELTEL	Worldreader.org, intel	M-PESA, paga	RETAIL TOWER, 53 shopatica	GRUNDFOS, GRUNDFOS LIFELINK, TRAVBUDDY	Kenya Revenue Authority, www.lands.go.ke
6 R&D and innovation	ChildCount+, RapidSMS	KENET, AED Ideas Changing Lives	*iHub_	m:lab, meltwater entrepreneurial school of technology, Co-Creation Hub	FabLab nairobi	KARI
7 Financing	claimsync, Changamka	Africa Training Network, Education Africa	MFS AFRICA	KOPO KOPO, IBM, savannahfund	M-KOPA SOLAR, powerhive	
8 Leadership & governance	OpenMRS, CDC	KENET	CENTRAL BANK OF KENYA, BANK OF GHANA	GCNet, KUZiMA		KENYA openData, ICT BOARD, Ghana Open Data Initiative

3. Kay, Misha. National eHealth Strategies in the Global Observatory for eHealth (GOe), July 2012 http://www.itu.int/ITU-D/cyb/events/2012/e-health/Nat_eH_Dev/Session%201/eHealth%20strategy%20toolkit%20launch%20July%2024-26%202012.pdf.
4. GSMA Mobile Money Tracker, 2012
5. World Bank, Maximizing Mobile: Mobilising the Agricultural Value Chain, ICT4D 2012
6. World Bank, Maximizing Mobile: Mobilising the Agricultural Value Chain, ICT4D 2012

Effective government leadership and governance is crucial to creating a foundation for a vibrant Internet economy

There is not a single success model for building a flourishing Internet economy. Each government must respond to its own country context, shaping national policies, investment plans and crafting legislation that reflects national priorities. Looking across national approaches to developing a vibrant Internet economy, we have highlighted three major roles that governments can play.

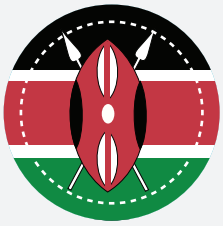
Government as a visionary: Strong government leadership in defining a national vision and strategy for the use of ICT and the Internet is an important signal and practical way of aligning a diverse set of national actors. Ideally, this strategy is integrated into the broader national development strategy to allocate budgets and show how the Internet can support the achievement of sector specific goals and objectives. Countries that have seen rapid development of the Internet have been proactive in using national strategies to drive investments in key public-goods related to the Internet. These can be developed using a combination of instruments such as direct public investment, public-private-partnerships, tax breaks and incentives.

Government as a catalyst: Creating the environment within which actors can invest in and collaborate around the use of the Internet is a crucial role of government. However, finding the right balance between allowing market forces to create the ecosystem and ensuring healthy competition and affordable access for consumers is not easy. Relevant, appropriate and transparent regulation, licensing policies, and managing arbitration channels are key to ensuring the potential of the Internet is realised.

Government as a first adopter: The public sector is often among the largest consumers of ICT services and a major source of data within a country. With a national mandate to provide social services, government has the opportunity to kick-start usage by role modeling behavior that includes digitizing content and using the Internet to transform service provision. The benefits of government shared services, facilitated through ICT and the Internet, are now well understood in terms of cost savings, service quality and access improvements. However, the secondary benefits of making public information available online are also numerous in terms of public accountability and enabling new business development. Government as a first adopter of various capabilities of the Internet can do a lot to catalyze national usage and realise impact.

Kenya and Ghana present two examples of distinct ways in which governments are demonstrating leadership and striking the balance between innovation and regulation. The Kenyan government has spearheaded numerous innovative Internet-related projects in East Africa, in part due to its active engagement and collaboration with the private sector. Ghana, with its strong and stable regulatory institutions, has built out a networked infrastructure in order to drive investment and create capacity. Analyzing the two approaches that these governments have taken and their respective results can be instructive for policy makers across the continent.

After providing a general overview of where Kenya and Ghana are positioned today, we will draw out a series of high impact or high potential initiatives that are contributing to current and future growth.



Kenya

The Kenyan government has actively engaged with the private sector and significantly increased its ICT activity to create an ecosystem that has helped attract 4.6M new internet users (12% of population) in the past year. There are a number of factors that have contributed to this growth. First, the Kenyan Government, particularly the Ministry of Information and Communications with support from the Kenya ICT Board, has been a strong advocate for investment in ICT and telecoms. Government has enshrined development of infrastructure and the ICT sector as part of the country's Vision 2030 and serves as a sound advocate for investment. Second, access to infrastructure has expanded, driven by the TEAMS cable and newly laid fiber optic networks which will continue to open access to new users. And finally, the growth of centres such as iHub, NaiLab and mLab have supported the developer communities and the incubation of new ICT businesses.

fact sheet...

- 808 GDP per capita (US $)
- 41.6M Population
- 5.2% GDP Growth, 2011-2012
- 89% Population covered by mobile network
- 16.1% Access to electricity, % of population
- 25.9% Internet penetration
- 109/183 WB Ease of Doing Business Ranking [Worldwide]
- 4.7M Mobile internet internet users
- N°9 WB Ease of Doing Business Ranking [Sub Saharan Africa]
- 39.41% Facebook users, % of online population

[SOURCES: IMF World Economic Outlook 2012; World Bank Development Indicators, 2011; World Bank Little Databook on ICT, 2012; Pro Analytics, checkfacebook.com]

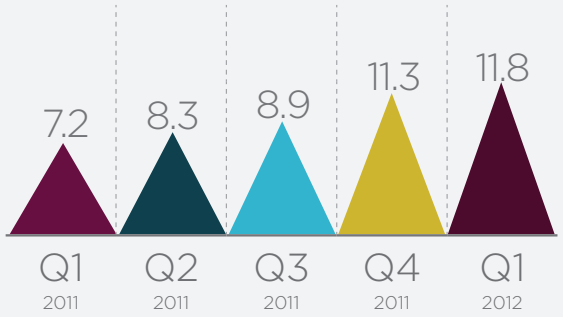
A vibrant supply side has helped to grow the internet economy...

- 4 sea cables now provide Kenya with over 5 million Mbps in total internet bandwidth
  - **90%** of bandwidth is supplied through Telkom Kenya Limited (EASSY)[7]
  - SEACOM's capacity has increased almost 50% from December 2011 to March 2012[7]
- Broadband prices have been trending downward, dropping more than **50%** between 2010-2011[8]
- Locally developed content is growing, likely increasing the relevance of the internet to local users
  - News and information sites, such as Daily Nation, The Standard and Mocality, are among the top 20 most popular local sites[9]
  - Innovation hubs like mLab, iHub and Nairobi Incubation Laboratory have helped to grow local applications

...bringing 4.6M new users onto the internet in the past year.

- Over the past year, internet penetration has increased **12%** points, a growth rate of **64%**[7]

Number of internet users in Kenya, 2011-2012 (millions of users)[7]



- Broadband subscriptions have increased more than **six fold** in the same time period, with over **500K** new subscriptions[6]

7. CCK, http://www.cck.go.ke/resc/downloads/SECTOR_STATISTICS_REPORT_Q3_JUNE_2012.pdf, June 2012
8. http://www.ihub.co.ke/blog/2011/09/mobile-broadband-in-kenya/
9. www.alexa.com

The three initiatives below illustrate the different ways that the Kenyan government has helped to grow the Internet by: 1) building public private partnerships, 2) coordinating overall investment in the sector and 3) directly investing government capital to expand the sector.

TEAMS (Public-Private Partnership)	Kenya ICT Board (Coordinator Role)	Pasha Centres (Direct investment)
OBJECTIVE: Connect East Africa to world communication network through fibre-optic cable	OBJECTIVE: For Kenya to become a top ten global ICT hub	OBJECTIVE: Providing access to underserved populations
DESCRIPTION: ~US$130M public private partnership with connecting Mombasa with Fujairah in the UAE, which serves as the center of Middle East fibre-optic network. The Government of Kenya holds 20% of shares, with the rest held or intended for private sector operators	DESCRIPTION: Kenyan Government entity which received ~90% of funding from the World Bank. It coordinates ICT activities across government entities, private sector, academic institutions, and the tech community in order to build infrastructure, promote digital inclusion, grow the business process outsourcing (BPO) sector, stimulate local digital content creation, and drive public sector ICT applications	DESCRIPTION: A Kenya ICT Board funded initiative that places electronic centers in underserved areas. These electronic centers are for-profit business that provide online government services. The ICT Board provides Pasha center owners with business training
RESULTS 5,000 kilometer fibre optic undersea cable completed in ~18 months	RESULTS 56 institutions of higher learning, representing 100,000 students and 5,000 faculty and staff, connected through fiber optic cables Provision of ~US$2 M in grants to 45 recipients to create local content Projected to enable 15,667 students to own laptops by providing US$120 Wezesha subsidy to reduce cost of laptops by 15-33%	RESULTS 29 Pasha Centers in 29 constituencies Provided 29 loans to start Pasha Centers; loans have helped start 15 new businesses and strengthened 14 existing businesses Pasha Centers receive an average of 440 visits monthly Pasha centers have created 40 new jobs in ICT sector. These jobs mostly go towards youth as 85% owners are below 45 years of age

[SOURCE: Timothy Waema, Catherine Adeya, and Margaret Nyambura Ndung'u. "Kenya ICT Sector Performance Review 2009/2010." Volume Two, Policy Paper 10, 2010. Researchictafrica.net; http://www.teams.co.ke; http://www.doitinkenya.co.ke/index.php; Interviews with Kaburo Kobia, September 12, 2012 Deloitte. Digital Village Report: Building networks and connections. 2012; Dalberg analysis]

Ghana

Ghana's approach to building an ecosystem for internet growth has focused on establishing a networked infrastructure and promoting government as an early adopter. Ghana was one of the first countries to introduce the Internet into its ICT market and has been patiently building out its infrastructure in order to position itself for growth[10]. This approach included a range of initiatives that focused on building government networks, enabling administrative systems and digitising processes to improve efficiency of service delivery. Although some of these initiatives are in the early stages of implementation, internet penetration in Ghana grew by more than 60 percent[11] from 2009-2011.

fact sheet...

- 1570 GDP per capita (US $)
- 8.7% GDP Growth, 2011-2012
- 60.5% Access to electricity, % of population
- 63/183 WB Ease of Doing Business Ranking [Worldwide]
- N°5 WB Ease of Doing Business Ranking [Sub Saharan Africa]
- 24.9M Population
- 77% Population covered by mobile network
- 9.6% Internet penetration
- ~1M Mobile internet subscribers
- 100% Facebook users, % of online population

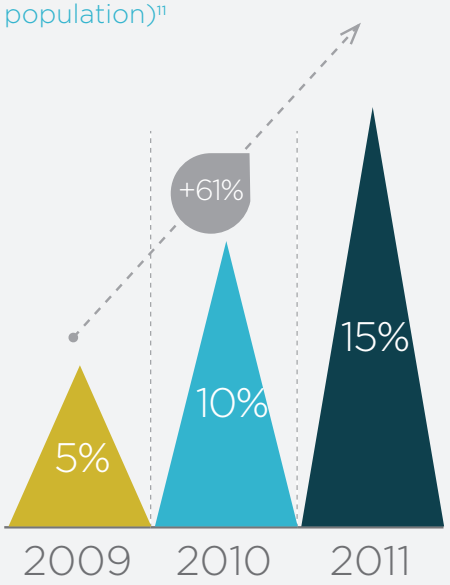
[SOURCES: IMF World Economic Outlook 2012; World Bank Development Indicators, 2011; World Bank Little Databook on ICT, 2012; Pro Analytics, checkfacebook,com]

A strong investment in building a connectivity infrastructure has created a solid foundation...

- Ghana was one of the first countries to connect to the SAT3 international fibre cable in 2002
- ICT for Accelerated Development (ICT4AD) was established in 2003 to provide universal access to high quality ICT services which would transform Ghana into a knowledge-based, technology-driven economy
- Price of wholesale bandwidth has fallen from US$ 2500 per mbps per month to US $297 per mbps per month over the past 5 years
- National Information Technology Agency is overseeing a number of initiatives including eServices, eParliament, eImmigration and ePolicing, which are expected to drive significant efficiencies and access

...contributing to over 60% growth over the past three years

Percentage of individuals using the internet in Ghana, 2009-2011 (% of total population)[11]



10. Ghana first connected to the SAT3 international fibre cable in 2002
11. International Telecommunications Union Statistics, 2011

The initiatives below illustrate the different ways that policy makers in Ghana have catalysed the development of a networked infrastructure in order to drive access. By supporting e-government services and coordinating selected investments, Ghana is poised to drive digital inclusion across the country.

Ghana Community Network (GCNet) (Using PPP to advance eGov)	Ghana Investment Fund for Electronic Communications (GIFEC) (Driving digital inclusion through targeted investment)	eGovernment Network Infrastructure (Establishing government as an early adopter)
OBJECTIVE: To develop and operate a customised electronic system for processing trade and customs documents	OBJECTIVE: To facilitate the provision of Internet connectivity to underserved areas of the country	OBJECTIVE: To build a nationwide government network
DESCRIPTION: GCNet is a customs and trade facilitation e-government application initiated in partnership with private sector partners including Ghana Commercial Bank, Ecobank, the Ghana Revenue Authority, and the Ghana Shippers Authority	DESCRIPTION: Implementing agency of the Ministry of Communications, established in 2004, to facilitate the spread of ICT and use in rural Ghana. Agency is promoting digital literacy and access through a range of initiatives	DESCRIPTION: Established in 2008 with a US$ 30 million loan from the Government of China to construct an initial nationwide e-government infrastructure. Includes a Data Center, WiMax coverage and Fiber Optic Metro Area Network (MAN) for 15 cities
RESULTS As a result of GCNet customs revenue is reported to have increased by 49% in the initial 18 months Customs clearance said to have been reduced from 6 days to <4hours in the Accra Airport	RESULTS >200 schools provided with ICT labs and internet access 93 Community Information Centres equipped and providing ICT training 350 Security/disaster response agencies connected e-Health, Community Information, School Connectivity, Rural Pay Phone, Easy Business, Post Office Connectivity, the e-Fishing, the Public Education Electromagnetic Field exposure and Health and the Library Connectivity Projects	EXPECTED RESULTS Network is configured to reach: up to 1050 sites across all 170 districts with fixed fibre-optic connections An additional 550 locations via wireless last mile access networks Ongoing upgrades of fibre-optic infrastructure on eastern national corridor

[Source: Transformation Ready: Using ICT to Fast Track Africa's Development Path. WorldBank, IFC, InfoDev, Korean Trust Fund, 2010; Dalberg analysis]

As we are beginning to see, the Internet is a fundamental tool for achieving both economic and developmental objectives. While impact has been tangible over the past few years, Africa's potential to harness the impact of the internet is largely untapped. Policy makers have a unique role to play. As illustrated by both Ghana and Kenya, policy makers can serve as leaders, enablers and early adopters in order to create space for an organically grown ecosystem where innovation can thrive.

The internet economy in Africa, an ongoing study

Google & Dalberg

The findings shared in this publication are highly preliminary and form part of a larger study that has been commissioned by Google Inc. and is being conducted by Dalberg Global Development Advisors. The study will analyse the economic and social impact of the Internet across Sub-Saharan Africa, in order to support policy makers in understanding the following questions:

- What is the economic and social impact of the Internet?
- What are leading examples of Internet related systems, applications and services that have created economic and social value in Sub-Saharan Africa?
- How can policy makers and industry leaders accelerate access and the level of impact in their countries?

In order to answer these questions, the study will draw on expert interviews from the continent and the world, market surveys with local businesses and other relevant organisations, as well as extensive desktop research. The results of the study will be released in early 2013 and we welcome your engagement and input into this study.

Should you wish to participate or learn more, please contact Robin Miller at robin.miller@dalberg.com.

Dalberg

Dalberg Global Development Advisors is strategy firm focused on frontier markets in general and Africa in particular, working with senior leaders across sectors, including the ICT space. During the last 10 years, Dalberg has successfully completed more than 600 engagements. Dalberg has worked for national governments across Africa, leading multilateral institutions, private sector clients including 10 Fortune 200 Global companies, international agencies, foundations, NGOs, governments and global corporations operating or investing in frontier and emerging markets. Our core advisory services include: (i) development of innovative strategies, approaches and market mechanisms; (ii) internal organisational reforms and restructuring initiatives; (iii) market and investment analysis and market-entry strategies; and (iv) coordination and facilitation of large multi-stakeholder initiatives. We focus on eight key sectors: Access to Finance, Agriculture, Conflict & Humanitarian Aid, Corporate Strategy, Economic Development and Competitiveness, Energy & Environment, Global Health, and Strategy & Performance. Dalberg has a global network of eleven offices across five continents including three in Africa located in Nairobi, Dakar and Johannesburg.

COPENHAGEN | DAKAR | GENEVA | JOHANNESBURG | LONDON | MUMBAI | NAIROBI

NEW YORK | SAN FRANCISCO | SANTIAGO | WASHINGTON DC