What type of national ICT policies maximize ICT benefits?

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Abstract

There is a general agreement that policies are needed to bring the benefits of information and communication technologies (ICTs) to developing countries. This paper argues that the benefits of ICTs lie in the opportunities it offers developing countries to learn, innovate and create ICT-based jobs, products and services. ICT policies that are tailored to realize these opportunities are likely to enable individuals and organizations to fully participate in and contribute to the global information society while those policies that focus largely on "needs" may fail to lay the foundation for future growth of the information society.

The paper looks at Africa's current ability to harness the opportunities ICTs offer. It uses the growth of the mobile phone in Africa and strategies of a number of countries to identify key policy elements and gauges the Korean and Zambian ICT strategies against these elements. It concludes that strategies that seek to realize ICT opportunities often generate clear ICT visions and action-oriented, focussed and measurable targets than those that focus on needs.

Introduction

It is often taken for granted that "policy matters". However, the effectiveness and performance of a particular policy depends largely on the 'opportunities' it offers key stakeholders rather than the "needs" to be met. Policies that focus on opportunities market the dividends that all key players stand to gain if they invest their resources, technologies, time and skills in the strategy. It is these opportunities that attract the interest of all the players and lays the foundation for future growth .

Policies that emphasise tend to focus on the supply-side of ICTs and thus catalogue the extent of the problem, identify those who are in need (e.g., users) and responsible (e.g., service providers), and then design measures to correct the imbalance (e.g., taxes). They Ignore the demand-side and curtail the emergence of a vibrant ICT industry, discourage investment and knowledge development, all of which a vital in bridging the digital.

In practice, most countries' policies fall in between these two extremes. In Africa, countries that have followed the National Information and Communication Infrastructure (NICIs) scheme designed by the African Information Society Initiative (AISI) (e.g., Ghana, Malawi, Rwanda and Zambia) seem to adopt ICT policies that emphasise "needs" while countries that develop their own policies (e.g., Egypt, Mauritius, Morocco, South Africa, and Tuni-sia) seek opportunities. [1]

The countries that follow the NICI process conduct an extensive search for national priorities and needs, sensitize the community, develops ICT frameworks and write policy documents, action plans and legislations and develops implementation and monitoring bodies, among others. [2]. The other group of countries focus on the development of the building blocks for the information society (human resources, infrastructure, effective government, ICT financing and streamlining investment laws etc). The countries that develop their own policies are said to have been more successful in Africa. [3]

The difference seems to lie in the perception and strategies rather than in intentions of the overall policy. One set of policy makers realize that the only way to effectively bridge the digital divide is to "... create an environment in which entrepreneurs can flourish, in which minds can expand, in which technologies can reach new frontiers". [4] It is the individuals, firms and organizations that will develop and use ICTs to deliver services, create jobs and wealth for the country. This strategy seems to work.

The other set of policy makers view the poor as victims caught on the wrong side of the digital divide and are denied the benefits of ICTs. In this case, identifying the needs and providing quick-fixes (e.g., cheaper gadgets and networks etc) that are specifically designed for the poor forms a large part of the solution. In poor countries, the list of needs could be endless and conflicting. Experience shows that this strategy, so far, is not successful in narrowing the digital design.

Part of the challenge resides in the fact that many strategies drawn from policies that focus on needs are often designed as an "end" (standalone mini projects) rather than to serve as foundations for future development. This could stall development. Mark Bernett, who helped make Zambia become the fifth African country to get onto the internet, summed it up as follows: *"By 1993, we had decided that we wanted "the real thing".. full Internet access, .. There were plenty of people who said that Africa had other priorities - after all, wasn't Fidonet (e-mail) working - or that Africa needed its own systems of communication...but with the relevant bits of string and sticky tape, ..[Africa] has gone from Zambia being one of the only countries with a connection to no country being without"* [5].

Although there were 4 donor-sponsored, email-based projects that the University of Zambia had successfully executed by 1993, no donor was interested in financing

full internet access. Thanks to the lack of support, the University devised its plans, got a loan and developed Zambia's first internet service provider (ISP) and demonstrated to other players that internet services were not a privilege for advance countries. [6]

It may seem bizarre that donors that were interested in connecting universities and health centres were not interested in internet connectivity. In reality, the email-based projects were designed to be a success in themselves and not to build capacity needed to join the internet revolution. And yet, it is such ISPs that have formed the backbone of the current internet-based businesses, community, government, and individual services without which the divide would have been much wider.

A national ICT policy should address these challenges by providing the basic building blocks, streamlining its legal and regulatory policies to stimulate learning, creativity and innovation. For example, the Uganda Communication Commission (UCC) has provides grants and waives the licensing fees for internet cafes, telephone centres, postal and courier facilities in rural areas. Since 2003, it has supported the development of 20 telecentres, 54 ICT training facilities, 50 internet cafes, 316 pay centres and 25 rural postal service offices in rural Uganda. In addition to expanding the ICT services to rural areas, it has created entrepreneurs, jobs and technology awareness and wealth. It is a strategy that maximizes opportunities and benefits for all key stakeholders. Therefore, it is possible to see the digital opportunities in the digital divide even for the poor.

The first part of the paper looks at the ability of Africa to harness the opportunities ICTs present and second looks at the key ICT strategy elements needed to realize the opportunities it offers. The third section gauges the ICT strategies of Korea and Zambia against the elements.

## 1. Harnessing opportunities and perception of policy makers.

1.1 Can Africa harness the opportunities ICT offer?

ICTs contribute to economic development in two ways: 1) the effective use of ICTs in production, distribution and marketing of products and services, and 2) the production, assembly and export of ICT products and services. [7] The use of ICTs by firms, institutions and individuals is expected to results in increased productivity while the production of ICT products and services helps expand the economy and increase and diversify exports.

Some would argue that Africa is already harnessing the opportunities that ICTs offer. There are now many African people connected and others who are employed in the ICT sector directly or indirectly. Africa is saving time and resources by putting reliable and faster communication tools in the hands of its people, firms and institutions.

In comparison to other regions, even when one considers the level of economic development, Africa appears to be

Figure 1. ICT opportunity Index of African countries
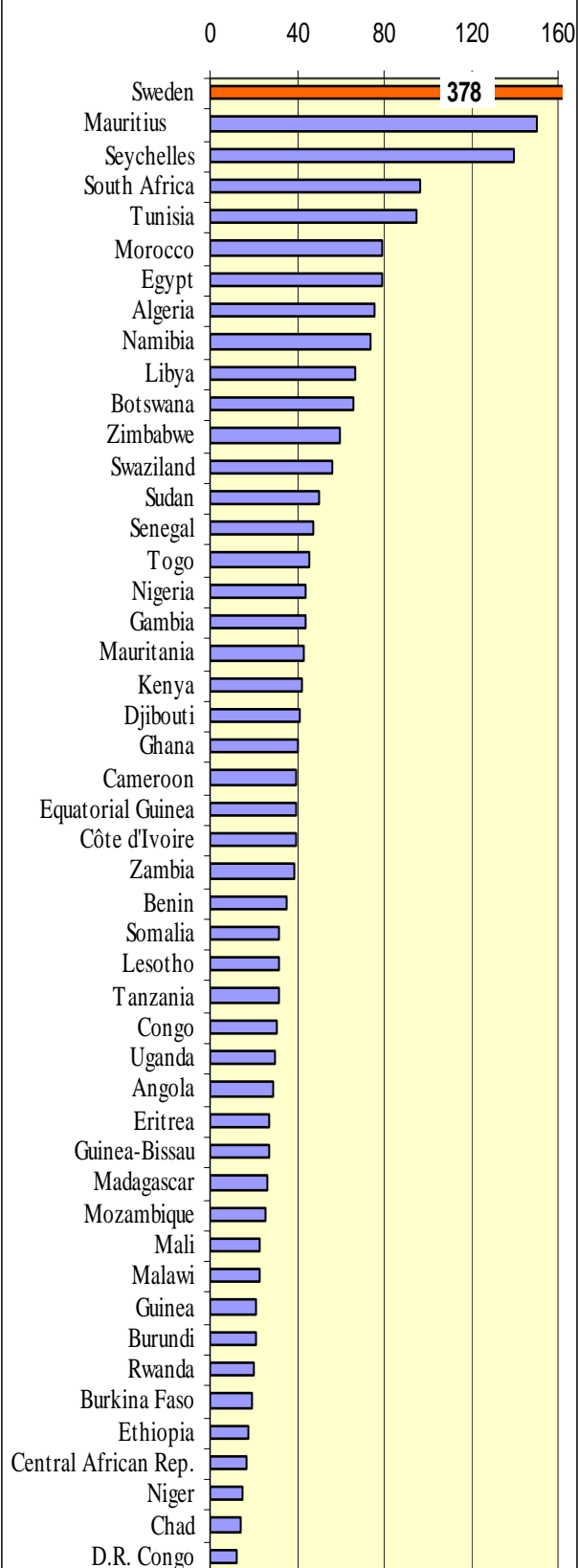
Source: ITU

lagging behind.

Most African countries are in the bottom ranking of the International Telecommunications Union (ITU) ICT Opportunity Index (ICT-OI) for 2007 (see Figure 1). The indicators used in constructing the index include networks, skills and usage. [8] Based on this index ranking, Sweden scores about 378, the highest in the World, and Mauritius (the highest in Africa) scores only about 150. There are only four African countries with a score of above 80 while the rest are in the bottom range of the list.

The average score hides an even poorer score in ICT networks index (fixed lines, mobile phone and internet bandwidth). For instance, Sweden scores about 605 in the network index while Mauritius scored a paltry 142. The gap between the two countries is wider than given by the ICT-OI. Indeed, Africa's bottom 10 countries have an ICT-OI score of less than 26 but a network score of less than 16!

Africa's ICT-OI may be very low but the usage figures are even lower. A survey of ICT usage in 14 African countries revealed that the most commonly used communication tool by formal and informal sectors in Africa is currently the mobile phone (see Figure 2). Tools such as the internet and computers ranked even lower than the postal mail box (for the informal operators). Even in the formal sector, the use of internet is about half that of computers and phones. In the case of Tanzania, only 20% of firms that have computers used them for basic business functions, such as, invoicing, and only about 30% of those that had internet access frequently used it. About 13% of firms ranked Internet as an important marketing tool. [9]

In countries with relatively more advanced ICT networks, the usage of modern tools by SMEs is much higher. A poll of about 6000 owners of SMEs in South Africa in 2006 found many SMEs to be "satisfied with the availability of information and communications

technology but still wrestle with the challenge of securing the skills and expertise necessary for sustained performance." [10] About 76% of entrepreneurs surveyed regard ICTs as important tools for business.

Taken together, there are at least three major issues that African policy makers need to address if the continent is to harness the opportunities offered by ICTs: 1) look at ICTs as development tools that can transform sectors, add-value to services and basis for new industries, 2) lay the foundation on which such transformation of Africa economies could be based and 3) design support measures that specifically target the emergence and growth of an ICT industry. Africa has everything to gain and nothing to lose: we cannot get worse than we are (We pick up these points in the next sections).

1.2 Policy and the growth of the mobile phone services in Africa.

The mobile phone growth in Africa has been spectacular and the mobile network coverage has extended beyond the reach of both landline phones and electricity networks. The number of subscribers to mobile phone networks in Africa increased from about 652,000 in 1995 to about 38 million in 2002 (see figure 2). This number is estimated to have reached about 188 million (20% of the population) at the end of 2006 and expected to triple by 2011. The rapid growth of mobile phone subscribers has beaten even the most optimistic projections made by ITU in 2003. ITU estimated that mobile subscribers per 100 inhabitants was going to reach 7.6 in 2005 (see figure 3) while the actual figure was about 13 per 100 inhabitants. [11]

It is estimated that the mobile phone industry revenue alone contributed about 1.4% of Africa's gross domestic product (GDP) in 2002. This figure is thought to have risen to 2.2% in 2004. [12] In Kenya, Tanzania, Rwanda and Uganda, the mobile phone contributed between 3.5

Figure 2. Access and usage of ICTs by formal and informal SMEs
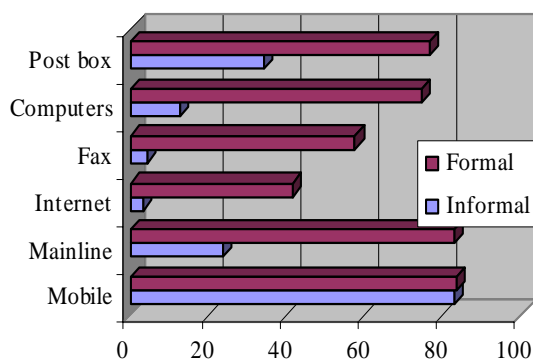
Source: Research ICT Africa,

Figure 3. Suscribers/users per 100 inhabitants in Africa
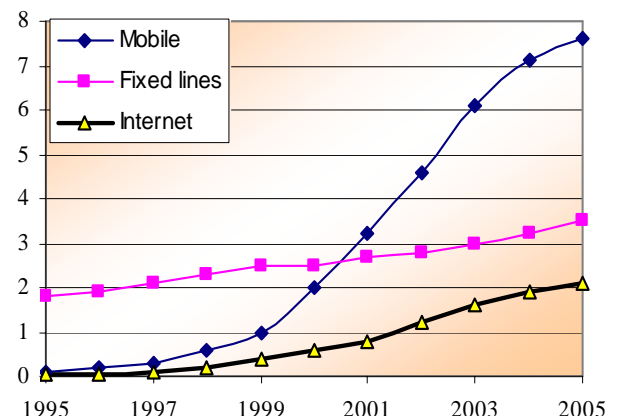
Source: ITU, 2007

NB: 2004 and 2005 figures are estimates

and 5% of GDP, employed about 500,000 people and accounted for more that 93% of telecommunication connections.

This growth has been driven by at least three major factors: (a) innovation, (b) demand and utility, and (c) regulation. Together, they provided opportunities for investors, operators, users and the governments.

a) The industry has developed innovative services that have made mobile phones meet some of Africa's challenges and avoided the hurdles that landlines face. Over 80% of the subscribers are pre-paid. It is flexible for resource poor users. The cost of top-up cards (airtime credit) ranges from $100 to $0.5. Such cards are affordable and creates an illusion that credit is cheap and yet they probably spend just as much or more on the service.

A recent report suggests that the "key changes [in African mobile phone business] are represented by the launch of lower entry points, through top-ups, scratch cards, credit transfers and e-top-ups". [13] Estimates now suggest that the lowest price for electronic top-up is about $0.41 and the average revenue per user has fallen to as little as $3. It is thought that over 95% of all mobile phone subscribers in Africa are prepaid.

In addition, some mobile operators have introduced the sharing of credit among subscribers. For example, Celtel Zambia offers a service called "Me2U" for pre-paid customers to send a portion of their units (airtime) to any other Celtel users in one short SMS. Such a system suits Africans, perhaps the most generous poor people, very well. It is also faster, safer and more convenient to send airtime than cash to a friend, child or other relatives. Even where such a service is not available, an SMS or a "beep" could tell a wealthier relative to call back. In Ghana its called "flashing" and in Zambia "paging".

In Kenya, Safaricom, the country's largest mobile phone operator is running a money transfer system- called M-PESA. It allows users to transfer money by SMS within the country, make deposits, withdrawals and check account balance. The customer simply buys electronic money (e-money) that could be sent to others. It is estimated that about $100,000 was transacted through the M-PESA system within one month of its launch.

M-PESA is not the only electronic mobile phone based money transaction service. Celtel launched Celpay - a mobile phone platform that allows individuals to access their account and pay bills and buy mobile top-ups. In Congo D.R., where years of corruption and economic mismanagement followed by civil wars, left few viable banks intact, Celpay registers about 3 million transactions a month. Celpay is also available in Zambia and is accepted mode to for paying for fuel, utility bills and member shops. [14]

In a nutshell, Celpay operates like a debit card. The mobile phone operators provides the subscriber with a more secure and user-friendly card that is linked to the subscribers account at a participating bank. Given the risks of carrying cash, distance to banks and the availability of mobile networks, Celpay type of services may provide an opportunity even for banks to expand to rural areas without huge investment in manpower, infrastructure and utility bills (e.g., electricity and water).

There are also efforts by the private sector to work together to provide an improved services to their clientele and grow their networks. For example, three mobile operators in East Africa (MTN-Uganda, Safaricom-Kenya and Vodacom-Tanzania) are launching a borderless network to charge about $0.26 per minute. In effect, they are creating a near roaming-free regional network. If successful, they would provide an excellent example to the European Union concerning roaming charges.

b) The growth of the mobile phone in Africa may seem surprising at first glance but it should have been expected since there is no other competitive communication system. The functionality of the mobile phone itself (calendar, calculator, camera, email, internet, video and watch), though not discussed here, has transformed it from being a business tool to a personal item and comes in handy.

The demand for telephone services that are reliable and affordable was very high. As of 1994, about 1.7% of the Africans had a telephone subscription. Even where the lines were available, the service was not at all guaranteed. Heavy rains and vandals easily cut off the connection and bills may be incorrect. [15] Mobile phones have overcome some of these challenges.

c) Regulations have also played a role in the development of the mobile phone. The 1990s were the time when most African countries were liberalizing their economies and democratizing. The telecommunication sector was largely opened up to the private sector but competition was largely in the mobile telephone services. The number of countries with monopoly mobile operators dropped from 32 in 1997 to 14 in 2004. Therefore, it is not surprising that mobile operators have been service-oriented.

However, there are feelings that the regulatory environment is still far from meeting best practices. It is estimated that an additional $4.8 billion investment in mobile phone industry in SSA would have been made by 2005 (sufficient to connect an additional 25 million subscribers) if the best practices in administrative and regulatory regimes were in place. Some of the key obstacles include the lack of basic skills by regulators to assess the economic and social impact of policies, the lack of clear objectives and targets to guide the industry and the absence of predictable, consistent and transparent guidelines in the industry.

For example, the tax policies of many African countries seem to contradict government pronouncement about digital divide. A study of 33 African countries by Deloitte in

2006 revealed that taxes account for about 20% or more of the cost of owning a mobile phone in 11 African countries and between 15-20% in another 9 countries (or 20 out of 33 with taxes higher than 15%). [16] Although balancing the needs to collect the appropriate revenue due to government and encourage mobile phone coverage and use may be a challenge, tax levels of above 15% indicate that some governments treat mobile phones as luxury services rather than a tool to empower the poor or bridge the digital divide. This leaves demand, competition and technology as the drivers of the growth of the mobile phone in Africa.

2. Perception of the role of ICTs and ICT policy.

There are three major views on how to mobilize ICT for development:

(a) Some view ICTs as a major development tool for the poor if only they can have access. Thus ICTs are seen in the same vein as other development tools such as roads, bridges and railway lines. From this perspective, penetration of or access to ICT tools (e.g., percentage of population connected) becomes a measure of development by itself. It is therefore not surprising that most of the global statistics focuses on access. The assumption is that the tools will eventually empower individuals to realize their own opportunities.

(b) Others think it is not merely access but the concrete use of ICTs that matters. Although access is important, the focus is on the extent to which ICTs are used to produce and deliver goods and services. From this perspective, the benefits of ICTs are not assumed to follow automatically from access to the tools but rather through active use. Rather than a focus on broadband penetration, attention is drawn to services and business transactions made possible through the new communication tools and their diffusion.

(c) There are also others who view ICTs as an industrial development opportunity or 'technological niche', where even countries lagging behind could catch-up with leading nations in the use, development and economic exploitation of the technology. The focus here is not just to have access but to participate in the development, commercialization and production of ICT products and services.

2. 1   ICT Policy elements

The perceived benefits of ICT by a country may influence the nature and importance attached to the sector. As shown in table 1, Mauritius and Malaysia have high-level ICT ministerial committees that are chaired by their respective Prime Ministers. On the other hand, Ghana has a committee that is Chair by the President of the University of the Future. The decisions and recommendations

that the respective committees are likely to make will have varying political weight.

The declared missions and targets of the ICT policies become more specific, measurable and focus as one moves (across table 1) from Ghana to Malaysia. For example, the telephone penetration density of 25% in urban areas and 10% in rural areas that Ghana seeks to attain by 2010 is likely to be attained even without its current policy. It also explains why the Ghana policy is relatively technology neutral.

In general, there are at least 6 key elements that ICT policies, as a minimum, have to address:

2.1 Designing a clear vision

Why does a poor country like Zambia or a rich country like Sweden need an ICT policy or ICT Commission, respectively? Why don't they promote all aspects of ICTs through their broadcasting, telecommunication, technology and industrial policies? The answer forms the mission of the ICT policy.

The mission or theme of the ICT policy needs to be clear and focused, and conceived at the high-level or at least with a direct participation of high-level officers (e.g., cabinet level). It should be (or at least sound) ambitious, inspirational and simple for politicians to support and market. Broad visions may be all-inclusive but they are often overly ambitious, unrelated and expensive to implement especially in countries with limited resources.

No policy should be designed simply because other countries have one or donors/international institutions are seeking to help develop one. The reasons for developing a policy should be guided by national interests if it is attract support, perform and meet the set goals.

2.2   Specific and action-oriented targets

Political support of a policy may depend on how well technocrats have framed or defined the targets. The targets should provide clear answers to: what activities will be undertaken, when, by who, at what cost and what will be the benefits to the country or stakeholders? Governments, especially poorer ones, have limited budgets and are very sensitive to vague promises with a high initial investment costs. Focusing on the factors that appeal to industry, government and public institutions as well as those that use existing institutions may be favourable. In other words, the targets should be inspirational, clear and forward-looking if support is to be maintained.

In countries such as Zambia, the number of targets should be modest and short-term even when the vision is long-term. For example, developing an IT infrastruc-

ture capable of delivering data, voice and video to every district in 5 years is an ambitious vision by itself (consider that the policy alone took 4 years to complete). In this case, the targets would narrow down to the technology (e.g., fibre, satellite and radio), sequencing (which districts first and what technology for which region), when and who will undertake it, how much will it cost and how other players will use it (e.g., ISPs, municipalities, schools, mobile operators and broadcasters etc). Unclear and overly ambitious targets may scare

other stakeholders, especially politicians.

2.3 Regulations and support measures

The regulatory regime of an ICT policy could be divided into three main categories: 1. the general guidelines or laws that govern the conduct of players, 2. regulations designed to promote technology development, transfer, rollout and commercialization and 3. the administrative and support measures that indirectly promote the growth of the ICT sector. The first group of regulations

Table 1. A comparison of political support, visions and targets of three national ICT strategies

	Ghana (2004)	Mauritius (2004)	Malaysia
High level Committee	Committee within the ministry of information chaired by the University President	A ministerial committee chaired by the Prime Minister	Ministerial Council chaired by the Prime Minister
Vision	Provide every citizen and resident access to high quality and affordable ICT services to transform Ghana into a knowledge-based and technology-driven economy	Make ICT the fifth pillar of the economy (after sugar, textile, tourism and offshore services)	Enhance the existing investments in information, communication and multimedia services (ICMS) infrastructure that will support future growth of ICMS services.
Targets	1. Universal access for all communities to internet, telephone and multimedia by 2010 2. Telecom service penetration to reach 25% in urban and 10% in rural by 2010 3. Connect all schools, clinics and public offices to advanced telecom services 4. Fully open, private, competitive markets for all telecom services 5. Streamlined, efficient and effective regulations of the industry that are technology neutral, fully transparent and competitive 6. Affordable prices for telecom services, especially for the poor 7. Profitable investment opportunities for business in all segment 8. Ghana as a first-class hub for investment, jobs and development, leader in transformation of Africa.	1. Increase fixed telephone density from 28% to 35% by 2005 2. Increase mobile cellular telephone density from 37% to 50% by 2005 3. Extend broadband connectivity to all business hubs within the country by 2006 4. Provide at least 30% of household with broadband connectivity by 2008 5. Provide at least 50% of household with Internet connectivity by 2008.	By 2008: 1. High Speed Broadband : 2.8 million subscribers; 2. 3G and Beyond: 1.5 million subscribers 3. Mobile TV: 75% mobile users adopt mobile TV 4. Digital Multimedia Broadcasting: 60% household coverage for DTTB. 5. Digital Home: 500,000 homes Interwork with external networks 6. Short Range Communications: Extensive usage in the supply chain management, Local manufacturing of RFID chipset 7. VoIP/Internet Telephony: Residential & business service revenue constitute RM 1 billion 8. Universal Service Provision: Increased broadband Internet individual access
Technology the policies seek to support	Technology neutral	1. Global mobile personal communications by satellite, 2. Internet telephony, 3. Mobile cellular, 4. Fixed wireless, 5. Mobile wireless 6. Multimedia 7. Cable	1. High Speed Broadband 2. 3G & Beyond 3. Mobile TV 4. Digital Multimedia Broadcasting 5. Digital Home 6. Short Range Communications (e.g. RFID-based) 7. VoIP/Internet Telephony 8. Universal Service Provision

Sources: http://www.gov.mu/portal/goc/telecomit/files/finalntp.doc, http://www.ict.gov.gh/Telecom%20policy/Ghana%20Telecom%20Policy%20Final.pdf and http://www.cmc.gov.my/Admin/WhatIsNew/55077762MyICMS%20final%20191205.pdf

sets out the general ground rules: competitions, standards, nature of service and licensing arrangements etc.

The second set is a collection of discretionary regulations that government may use to promote growth in one part of the industry. The industry and its partners may also lobby government for support from time to time to help meet a given target or survive, such as taxation, licensing fees, incentives etc. This group of regulations may change annually (with national budgets). The third refers to support provided elsewhere that helps the industry development. For instance, science and engineering education, start-up funds for SMEs, labour and market flexibilities, competition policies and contracts etc. Effecting change in other sectors may require the participation, appreciation and understanding of institutions and agencies in other ministries.

The first set of regulations is possibly predictable and industry can plan around them. The second set is not and a policy needs to pay attention to them as they could disrupt, discourage or facilitate investment. The third set of regulations play a vital role in the learning, adaptation and development of the industry. For instance, inflexible labour laws may make it difficult to change the business strategy of a firm if it results in manpower loss. Similarly, lack of skilled manpower could discourage investors or hinder development of new services while a functioning money market may promote expansion.

For example, Mauritius offered foreign and domestic investors in the ICT sector a package of incentives to enterprises whose activities involve technology and skills above the average existing in Mauritius, a 50% income tax reduction for expatriate employees, duty-free status for their personal effects coming to Mauritius, accelerated procedures for visas and work permits, and the availability of work permits for spouses. It has also developed the Ebène CyberCity - a property owned by a State enterprise - as an ICT park and role model for future ICT-connected communities.

2.4 After launch Campaign and awareness initiatives.

Countries invest significant amounts of energy, resources and time conducting consultations, gathering information, identifying priorities and needs, draft documents and then handover the draft law to parliament to enact. After a grand launch, all the players go back to "business-as-usual" and the policy seems to vanish or gather dust on some shelf.

The policy beneficiaries may create contact teams in different areas of interest, collaborate or share information. For instance, a team of IT firms, financial institutions, research centres and government agencies could review emerging projects, global technologies, competition, skills and national and international regulations.

They could make presentations that raise interest in the government and public interests.

2.5 Creating markets

An effective ICT policy should seek to address the entire innovation strategy - from design, initiation, development and commercialization of new and mature products and services. This could generate a dynamic and competitive industry. For that to happen, the policy should provide support for marketing the products and services the policy stimulates at home and abroad. This could include easy and cheaper market entry conditions, protection of inventions and promotion of the products at home and abroad.

Government is one of the largest organization and thus potentially a major user of ICT products and services on the domestic market. Governments could encourage business houses and their own institutions to adopt new technologies to improve their operations. For example, when Zambia developed its stock market in 1993, it settled for an electronic one. [27] The Lusaka Stock Exchange (LuSE) uses an electronic clearing and settlement system. Since it does not use physical certificates, an investor can get his/her shares or money in three days. Tax authorities, hospitals, schools and universities, among others, could be required to use some of their limited resources to develop e-services, not just for communication, but as part of their modernization strategies and development. Government could also encourage firms to shift to an e-economy through well crafted incentives and regulations. Such moves could provide additional market and learning opportunities for ICT business houses and individuals.

2.6   Promoting investment in ICTs

There are many challenges Africa faces in promoting and attracting investment in the ICT sector. Many African countries have a low FDI potential and are unlikely to see substantial increases without improving their business environment and ICTs could be one such area. According to UNCTAD's FDI Potential Index ranking, there are only four African countries with a high FDI potential. However, almost half (14 out of 31) of the countries that are considered high FDI performers but have a low FDI potential are African countries (see table 2). Given that most of the reforms have already been implemented (e.g., privatization which attract FDI), Africa countries may wish to develop their ICT sector to attract investors or improve the general FDI potential of the country (to move into the high -FDI potential, high FDI performer class).

ICT policies that conceive projects of interest to the private sector, research centres and international institutions could attract investor. For instance, Malaysia's Multimedia Super Corridor (MSC) has attracted about 900 multinational firms and formed the basis for a number of its flagship projects such as Smart Schools,

Telehealth, smart card technology and e-government. Mauritius's cyber city and Thailand's Science Parks have had similar impacts.

3   National ICT policy or ICT strategies?

The ICT policy is supposed to solve bottlenecks, such as those highlighted earlier, in order to realize the full potential of the current and emerging ICT tools. It is supposed to be a tool that will guide a country to bene-fit from the modern ICT tools and address or redress some of the ICT challenges. For this to happen, the pol-icy is supposed to be dynamic, focused and action-oriented to meet the aspirations of the country.

Here, we compare the ICT strategies of Korea and Zam-bia and see how well they meet the key elements dis-cussed in section 2.

3.1   The case of Korea

Korea has developed a competitive ICT industry in the last 4 decades and increased the penetration of many ICT tools in the country. One of the early goals was to eliminate the waiting list and increase penetration of telephone services. To achieve this goal, Korea intro-duced the one-phone, one-family policy and separated the national telecommunication firm from the Ministry of Communication in 1982. Within 8 years of the initia-tive, the waiting list was eliminated and home phone lines increased from below 40% to 90%. [17]

Korea raised money for investment through bonds and restructured tariffs to promote investment in ICTs. An-nual investment increased from about $1.5 billion in 1982 to over $3 billion in 1992. In addition, the country charged its power utility (KEPCO) and telecommunication company (KT) with building an extensive fibre network that to license and carry traffic of cable and internet service providers.

In recent years, the Korean government investment in ICT projects increased from $131 million in 1996 to $322 million in 2002. Most of the investment was in high speed internet infrastructure (about 86% of the money in 1996 and 46% in 2002). The main goal was to facilitate private sector investors to rollout services in poor re-gions. Today, Korea ranks among the top countries in terms of high broadband penetration.

The current Korean ICT strategy launched in 2003 is dubbed the "IT 839 programme" i.e., '8 services, 3 infra-structures, 9 new growth engines'. [18] The eight ser-vices include: wireless broadband, digital multimedia broadcasting, home network, telematics, radio frequency identification, W-CDMA, terrestrial digital televisions and VoIP while the three infrastructures to support these ser-vices are: background convergence network, ubiquitous sensor network , and next-generation Internet protocol (IPv6).

These are expected to drive the new 9 growth engines: next-generation mobile communications, digital televi-sions, home network, IT system-on-chip, next-generation PC, embedded software, digital contents, telematics and intelligence service robot. Put together, they are sup-posed to help Korea become a "*nation connected by tele-com networks that will provide uninterrupted, high-speed access to the Internet, fixed lines and mobile networks anytime, anywhere by 2007*". [19]

Table 2. Comparison of FDI performance and potential of countries.

	High FDI performers	Low FDI performers
High FDI Potetial	Australia, Bahamas, Bahrain, Belgium, **Botswana**, Brunei Darussalam, Bulgaria, Chile, China, Croatia, Cyprus, Czech Republic, Dominican Republic, Estonia, Finland, Hong Kong (China), Hungary, Iceland, Ireland, Jordan, Kazakhstan, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Netherlands, New Zealand, Panama, Poland, Portugal, Qatar, Singapore, Slovakia, Slovenia, Spain, Sweden, Trinidad and Tobago and United Arab Emirates.	**Algeria**, Argentina, Austria, Belarus, Brazil, Canada, Den-mark, France, Germany, Greece, Islamic Republic of Iran, Israel, Italy, Japan, Kuwait, **Libyan Arab Jamahiriya**, Mexico, Norway, Oman, Philippines, Republic of Korea, Russian Federation, Saudi Arabia, Switzerland, Taiwan Province of China, Thailand, **Tunisia**, Turkey, Ukraine, United Kingdom and United States.
Low FDI potential	Albania, **Angola**, Armenia, Azerbaijan, Bolivia, **Congo,** Costa Rica, Ecuador, **Ethiopia, Gabon, Gambia**, Geor-gia, Guyana, Honduras, Jamaica, Kyrgyzstan**, Mali**, Mon-golia, **Morocco, Mozambique, Namibia**, Nicaragua, **Nigeria,** Republic of Moldova, Romania, **Sudan**, Tajiki-stan, **Uganda, United Republic of Tanzania**, Viet Nam and **Zambia**	Bangladesh, **Benin, Burkina Faso, Cameroon**, Colombia, **Côte d'Ivoire, Democratic Republic of the Congo, Egypt**, El Salvador, **Ghana**, Guatemala, Guinea, Haiti, India, Indonesia, **Kenya, Madagascar, Malawi,** Myanmar, Nepal, **Niger**, Pakistan, Papua New Guinea, Paraguay, Peru, **Rwanda, Senegal, Sierra Leone, South Africa**, Sri Lanka, Suriname, Syrian Arab Republic, TFYR of Mace-donia**, Togo,** Uruguay, Uzbekistan, Venezuela, Yemen and **Zimbabwe**

Source: WIR, 2006

The ultimate goal is to use ICTs as an engine of economic growth that will help raise the income per capita of Korea from $13,000 in 2003 to $20,000 by 2007, expand IT employment from about 1.2 million to 1.5 million and expand IT export products from $57.6 billion to about $110 billion over the same period.

To meet such ambitious targets, the Korean government and the private sector proposed to invest about $170 million and $85 million, respectively, in the initiative between 2003 and 2007. Korea already accounts for about 28% of the global mobile phone market, and is a major player in the semiconductor, liquid crystal displays and digital television sets. However, this project was designed to keep Korea a step ahead of its competitors.

An earlier report summed up Korea's strategy as follows: "*Korea has built and is continuing to build a stand-alone capability in a broad range of electronics technologies; electronics materials and packaging, and development of key new information technology products. The nation's strategic focus is on achieving dominance not only in the production and manufacture of electronics products and components, but also in creation and innovation of new technologies in the field. Korea is determined to remain internationally competitive in electronics in the long run and is prepared to commit the required long-term financial and logistical resources to achieve its goals.*" [20]

3.2   Zambia's ICT policy

The current ICT-related policies of Zambia were adopted as part of the structural adjustment programme (SAP) of the World Bank, which included the privatization of state-owned firms and opening up of the economy. As part of this process, Zambia enacted the Telecommunication Act (1994) which separated the Post and Telecommunication Corporation (PTC) into Zambia Postal Services (ZAMPOST) and Zambia Telecommunications Company (Zamtel). Another legislation of interest is the Broadcasting Act (1994, revised 2002).

Other than meeting the World Bank/IMF conditionalities, these changes were also needed to promote investment in the telecommunication and broadcasting sector and improve services. Like most of Africa, mobile phone, digital television and radio broadcasting services grew rapidly (figure 4). For instance, the number of radio stations has increased from one to about 25 over this period. They include commercial and community radio stations in urban and rural areas.

There is a feeling that the country that was a front-runner in getting onto the internet and launching private mobile phone firms but it is being overtaken by late comers. [21] It is also observed that investment in

the telecommunication industry of Zambia has fallen from $1.2 per capita in 1996 to $0.5 per capita in 2002 while that of Mozambique increased from $1.6 per capita to $2.7 per capita over the same period. [22]

Meanwhile the demand for ICT services in the country remains very high. Some rural districts used their constituency development funds to invest in digital satellite transmitters for television. The government tried to ban the practice but a public outcry soon forced it to lift the ban. [23] The state-run television station is now playing catch-up installing digital transmitters.

This year, the government released the national ICT policy (28 March 2007) [24] During its launch the President stated that the policy will help create "an innovative, market responsive, highly competitive, coordinated and well regulated ICT industry" to make Zambia globally competitive. [25] It will also "create a favourable business environment and promote Zambia as a destination for ICT-related investments within the region and on the international market."

The policy identifies 13 pillars: Human capital development; promoting ICT in education, research and development; promoting public access content development and cultural heritage; developing the ICT service sector; developing the telecommunications and support infrastructure; promoting e-commerce; e-government; integrating ICT in agricultural development; integrating ICTs in healthcare delivery; integrating ICTs in tourism, environment and natural resource management; mainstreaming youth and women issues; developing the legal and regulatory framework; and promoting security in the information society.

The vision of the policy is to develop a "*Zambia transformed into an information and knowledge-based society and economy supported by consistent development and pervasive access to ICTs by all citizens by 2020*". The above 13 pillars and their objectives and strategies are designed to realize this vision.

Figure 4. Basic ICT subscribers per 100 inhabitants: Zambia

Source: ITU, 2006
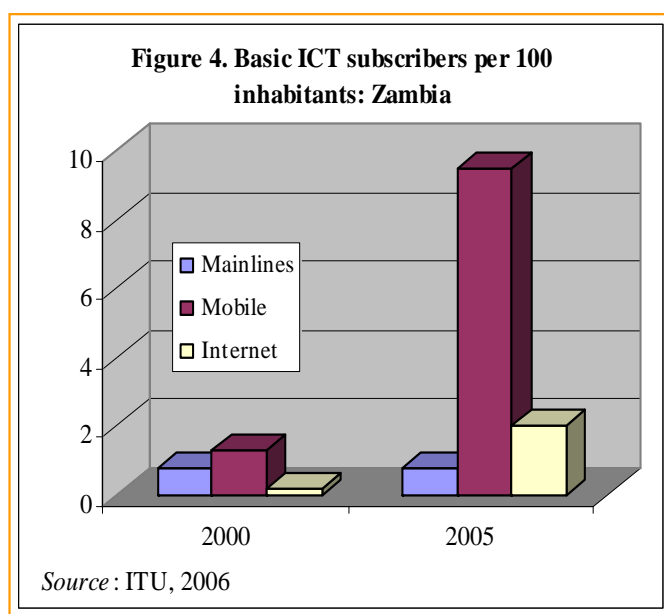
To meet these goals, the country seeks to establish a number of regulatory and promotional agencies. These include bodies such as the Computer Crimes Investigation Unit, ICT incubator, ICT Enterprise Development Fund and Zambia ICT Agency. These agencies are supposed to cooperate and work in close collaboration with the government to avoid duplications, promote innovation and entrepreneurship and provide a level playing field.

The implementation strategy seems to rest largely with government departments and public institutions. The location of the proposed ICT Agency has been left hanging, the role of the private sector is not clear and the relationship between the new agencies and existing one is not yet worked. Similarly, the financial, human and technological resources needed to meet the targets have not been worked out.

3.3   How do the two strategies measure up?

In terms of vision, both countries seem to know what they wish to achieve. However, the Korean vision is clearer and measurable. In a way, it is easier to hold the Korean government accountable for any failure and for success in meeting the goal (e.g., GDP per capita $20,000). On the other hand, the Zambian vision is not measurable in anyway.

The Zambian targets are likely to occur whether there is a policy in place or not. For instance, the level of ICT literacy and expertise, ICT infrastructure development, ICT contribution to economic development and use of ICT to promote entrepreneurship or reduce poverty is taking place already. External pressure and modernization efforts by firms will drive such goes.

It is also possible to galvanize support around a national strategy where all players feel they have a role to play. For example, both strategies seek to involve the private sector. However, the Korean strategy estimates the level of investment, use, production and exports the private sector needed to achieve while the Zambia strategy simply expects the private sector to participate. It perhaps reflects the differences in their ability to estimate the technological, economic and social impact of the proposed policies.

Both policies promise their citizens improved services and development. Korea promises its people by the time its ICT strategy is completed (4 years) their income will almost double and they will be using state-of-the-art ICT networks and products. Zambia promises its citizens things that would happen in 13 years (if one considers the current rate of growth of internet, mobile and television and their convergence, that will happen).

The Zambian policy has already been criticized for not addressing Zambia's involvement in the East African Submarine Cable (EASSy). Zamtel, the State-run firm,

enjoys a near monopoly on the project. [26] The Zambian strategy has a greater focus on legal and regulatory issues (e.g., requiring new projects to include ICTs, avoid duplication of infrastructure, liberalize all ICT policies, establish a rural ICT development fund etc).

Zambia charges ISPs $25,000 as for an operating license – a huge sum for start-up firms without any financial support. By contrast, Korea does not charge ISPs any fee. Korea only requires ISP to register.

The Zambian policy is a collection of what may have come from the World Summit on Information Society than providing a true national direction. Zambia is a poor country, unlike Korea, and does not have the luxury of abundant financial and human resources. it is all the more important that the policy should have had a focus in those areas it stands to gain most.

Zambia seeks to create new bodies for implementation and monitoring the policy but does not estimate how much is needed to run them. It does not say why the, for instance, the Zambian Communication Authority (CAZ) cannot handle communication development and licensing. Uganda has used this approach and it seems to work. The Korean strategy does not go that way.

The Korean policy does not emphasise labour and market flexibilities or go beyond automation of processes and production of services and electronic products. Perhaps highlighting the amount of catching up Korea needs to undertake to attain leadership position in value-added and productivity gains.

Policy makers should at least attempt to estimate the cost and impact of a policy on employment, productivity, efficiency, competitiveness, exports and wealth creation. Perhaps the main difference between the two is that one is more of a policy (government statements) and the other is more of a strategy (how governments want to achieve their goals). For Korea, government pick the winning technology services. Zambia does not seem to go that way.

Conclusion.

The growth of the mobile industry in Africa provides a good lesson why ICT strategies need to address demand and supply sides of their ICT visions. Although, there are no grand plans in many African countries that guided the growth of the mobile industry, it has and promises to deliver more products and services to the poor. Demand and innovation has led to the development of some Africa-first and Africa-specific products and services.

Government policies are only beginning to be supportive and leave much to be desired. A number of national monopoly telecommunication firms that carry traffic for other players seem to be making huge profit margins and national tax regimes seem to view ICTs as a luxury.

The competition and consumer protection rules remain an area of great concern. For example, the Mauritius regulator ICTA conducted a price investigation that led to the fall in the prices users paid Mauritius Telecoms for traffic on the SAT3 submarine cable from $10,000 per mbps per month to $3250 per mbps per month. This resulted in Mauritius Telecom's traffic on the cable to go up (from 17% to over 80%). There are few such determinations on the continent.

National ICT policies should develop strategies whose targets are action-oriented, focussed, measurable and inspirational to attract the interest of key stakeholders. They should also be timely as the technology is changing rapidly.

Currently, the focus on needs is not serving the continent well. Although Africa adopted "a master plan and a declaration to move [its] countries into the information age" in 1996, it remain at the periphery of the information society. Ironically, even the limited growth registered so far has been driven by entrepreneurial activities that have seen opportunities for growth in the ICTs market and not the grand plans.

Party of problem is the lengthy policy making process time. Zambia's first ICT policy draft was published in 2003, the final draft in 2005 and launched in 2007. During that period, mobile networks have been extended to some rural areas, new telecommunication and broadcasting firms have entered the market, wireless broadband deployed in some cities, more than 500km of fibre network laid, ePost launched, [28] and new technologies have emerged. While those developing the policy were busy identifying needs and priorities, others who saw the opportunities the market offered were busy realizing them.

Perhaps, more emphasis should be placed on the strategy and assessing the potential impact of the proposed policies on employment, productivity, innovation, competition and demand. The current NICIs schemes emphasise the "process of arriving at the vision" (policy making) and the statements of government (policy). The Korea ICT Policy is actually a strategy (and so it is called officially) with only 1-2 pages devoted to background information while the Zambian one devotes 23 pages (recounts the main United Nations, African Union, NEPAD, SADC and COMESA ICT initiatives). In this case (Zambia), policy is more prominent than strategy.

Many African countries are in a good position to harvest the opportunities ICTs present. The painful reforms that they undertook in the 1990s introduced labour and market flexibilities that could enable firms and institutions to quickly adopt new technologies and change their business models. This goes beyond simple automation or electronic linking of various entities. It entails streamlining and developing new producing, processing and managing products and services.

To realize such benefits, strategies should focus on laying the foundation on which the industry or services will be based (e.g., IT universities, networks, tax and licensing regulations, labour and market reforms etc) and stay out of most areas where the private sector is best suited to meet the needs.

Donors and government will have to focus on the big picture and support the emergence of an information society. In particular, mathematics, language, science and engineering skills, life-long education, financing start-ups especially in new sectors and in rural areas, communication infrastructure and supportive regulations. It is the dividends, not the divide by itself, that inspire individuals, institutions and firms to innovate, develop, produce and deliver the benefits of ICTs.

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