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Embracing "Open Access" in East Africa: A Common Internet Infrastructure Policy Agenda for Human Security and Economic Development

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In East Africa, development practitioners, economists, and local entrepreneurs believe the Internet can be a catalyst for economic growth and human development. However, these three communities lack a common agenda to make increased access a reality. This article attempts to find common language among these communities, and suggests they support a policy framework called Open Access, which aims to provide Internet access to the most people at the lowest cost through market-based solutions and limited public financing.

Introduction

Information Communication Technology for Development (ICT4D) is an increasingly popular buzzword in the East African human security community.[1] This community, which includes the overlapping professional worlds of humanitarianism, development, human rights, and conflict resolution, uses the term ICT4D to underscore the notion that the Internet, and other digital technologies, can be a powerful tool for reaching a wide range of socio-economic goals. For example, farmers can converse directly with

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their transnational suppliers instead of through inefficient intermediaries; children can use computers to learn basic skills and drastically increase their access to information; and journalists can self-publish via blogs in places where mainstream media show no interest.

Currently, however, East Africa is cut off from the Internet's global economic and information opportunities. The effectiveness, scope, and sustainability of ICT4D solutions in East Africa are necessarily limited by the prohibitive cost of providing Internet access there. While most of the world is connected to multiple submarine backbone fiber cables that offer the cheapest option for getting online, East Africa is one of the only regions in the world without a connection to fiber and is thus forced to pay exorbitant prices for satellite connectivity. According to the International Telecommunications Union (ITU), the UN agency that regulates and standardizes telecommunications, East Africa has an Internet penetration rate of only 3 percent, the lowest rate in the world, yet individuals pay on average between $250 and $300 per month for access, the highest cost in the world (ITU 2003). Governments and incumbent telecom companies in East Africa are unmotivated to change this status quo because they currently form a cartel that profits from the rent-seeking activities of limited competition and closed access.

Human development practitioners are often averse to enter infrastructure debates on this issue, which most commonly use the vocabulary of business and economics. But this is a vocabulary they must learn to use. Accordingly, this article argues that the single most effective step that these East African human security practitioners can take to improve the effectiveness of ICT4D programs is to support a comprehensive Internet infrastructure framework known as Open Access. Increasingly supported by economists and African business entrepreneurs, the Open Access model's goal is for the most information and communications services to reach the most people through the engine of market innovation and competition.

This article has three parts. The first part outlines the current state of the Internet in East Africa and illustrates how the human security community defines the debate over access in the region. This part argues that the community will be more effective at convincing governments to shift policy if experts use the language of economic growth. The second part describes two competing frameworks for internet provision and why the Open Access model is the better option for improving economic growth. This part also demonstrates the opportunity that exists for ICT4D practitioners to play a critical role in the Open Access approach and to help address problems that stand in the way of realizing the model's implementation. The third

and final part concludes with policy implications and recommendations for practitioners on how to advance and implement Open Access.

THE INTERNET IN EAST AFRICA: PRESENT REALITY, FUTURE POSSIBILITY

Information Communication and Technology for Development (ICT4D) has been high on the human security agenda since 2000. The Millennium Development Goals aspire to "make available the benefits of new technologies, especially information and communication" (UN General Assembly 2000, Target 18). The World Summit on the Information Society (WSIS), sponsored by the ITU and held in 2003 and 2005, is the highest-profile gathering around this aspiration to-date. The summit brought together government leaders, UN experts, and NGO representatives to discuss a broad range of issues pertaining to the role of information communication technology in the developing world.

The WSIS Declaration of Principles declares, "Our common desire and commitment is to build a people-centered, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge" (WSIS 2003). The discourse at such a gathering generally focuses on the role of donor agencies and NGOs. At the 2005 WSIS meeting, ICT4D expert Richard Gerster led a discussion that embodied the ICT4D community's values. His presentation, entitled "How ICTs Support the Eradication of Poverty: The Role of the Donor Community," detailed donor initiatives that support ICT skills being taught at rural schools and initiatives that promote the political participation of displaced persons through e-government (Gerster and Zimmerman 2005, p. 22)).

With so much high-level attention on promoting internet access in Africa, why do costs remain so high and penetration so low? There are two reasons. First, while Gester acknowledges that none of these programs are possible without sufficient internet infrastructure, he goes on to offer the mantra: "collaboration before infrastructure: technology is not a shortcut to development" (Gerster and Zimmerman 2005, p. 26). In a sense, this is the central reason ICT4D practitioners' strategy has been ineffectual. A successful approach to ICT4D must neglect neither the question of infrastructure nor the question of training. Without training, the Internet will not benefit the poor, but without a viable strategy to improve infrastructure, the Internet will not benefit anyone. Second, high-level international meetings and development declarations from WSIS are unlikely to convince African leaders to change policies. These leaders

have an enormous profit motive to continue controlling the market and pricing for Internet access in East Africa.

To see the Internet's development benefits, human security practitioners must continue to emphasize the benefit that the Internet can bring to the poor, but also utilize economic and business arguments that may better motivate East African leaders. One of the most compelling economic arguments for lowering the cost of Internet access in East Africa is that such a move will improve states' viability in the global economy. In an age of information outsourcing, cheap data connections are of primary concern. Studies have shown that outsourcing operations would cost 30 percent more in Kenya than in India, largely owing to the high price of information (McGlaughlin 2003). Further, communications costs affect the ability of a state to partake in the global trade of goods and services (Fink and Neagu 2002, p.2). The "death of distance" effect along with the threat of being left behind in an increasingly global economy might very well motivate African leaders.

In addition to global trade flows, African leaders may recognize that investing in telecommunications is one of the most profitable non-commodity investments that can be made on the continent (World Bank 2005). Witness the phenomenal success of mobile phones as a "leap frog" technology, bypassing previous technologies that require more cumbersome infrastructure. According to the ITU, Africans are willing to spend between 6 and 10 percent of their income on average for mobile phone technology, while in developed countries the level is closer to 3 percent (ITU 2003). Anecdotally, witness the miraculous story of Gambian entrepreneur Alieu Conteh's $10 million investment in a mobile license in the Democratic Republic of the Congo (DRC) during the First Congo War (1996-97). While the country had been dismissed for its crushing poverty and lack of rule of law, Conteh's company now has 3,000,000 subscribers and is valued at $1.6 billion, showing the value of digital technology to both consumers as well as investors (Zuckerman 2007).

With a decrease in the access price, many experts argue that the structural traits of broadband internet will make the technology at least as widely influential and profitable in Africa as mobile phones (McGlaughlin 2003). While the telephone is "circuit-switched, centralized, top-down, hierarchical, controlled, inflexible, intelligence at the core, proprietary standards," the Internet is "packet-switched, decentralized, distributed, ad hoc, flexible, end-to-end, intelligence at the edge, open standards" (McGlaughlin 2003, p. 12). The Internet is a far more versatile medium that allows for voice services like Skype as well as data services like Gmail. The amount

of user innovation on the internet and the ability for users to connect with more than a single contact means that the internet offers an entirely new way of communicating.

OPEN ACCESS: A BETTER SOLUTION

As mentioned in the introduction, East Africa is the only region in the world without submarine fiber connectivity, which is the cheapest, best technology for connecting to the internet.. In 2001, South Africa built a submarine fiber connection to Europe that ran up the West coast of Africa. Most West African nations bought access points in order to preempt future connectivity demands. East Africa has not had similar opportunities, so the current landscape of submarine fiber in Africa completely bypasses the eastern side of the continent. There is general consensus in the infrastructure business community that building a submarine cable along the coast of East Africa is the best option for improving access. However, this is where the consensus ends. There are two competing public policy models that are vying for capital to build a cable in the region.

The Club Consortium Model

The Club Consortium model is a closed agreement between several state-run telecoms that agree to limit competition and share the resulting high profits. The most prominent example of the Club Consortium mode is the SAT-3 submarine cable, which runs from South Africa to Portugal, with landing points in fourteen West African countries. South Africa Telecom laid the SAT-3 cable in 2001 to accommodate the high demand for traffic from South Africa to Europe.

While there was limited demand in much of West Africa at the time, several national telecoms bought into the agreement expecting demand to increase. The largest shareholders of the cable are AT&T, France Telecom, and VSNL. There are ten African shareholders, representing the national telecom of each of the connected West African nations (Esselaar 2007). The incumbent national telecoms also own the landing stations and control the access to the subterranean connections inside their respective countries. Since these companies have monopoly over access, they can sell to Internet service providers (ISPs) at extraordinary rates.

These rates differ by country depending to a large extent on the regulatory regime in place. For example, South Africa Telecom, operating in a largely uncompetitive telecommunications market, charges $25,000 for megabits per second (mbps) per month (the standard measure of information flow over bandwidth) to South African ISP's. While still expensive, the cheapest

rates are in Ghana, which made a deal with the Ghana ISP Association to offer bandwidth at $8,000 mbps per month (Fiber for Africa). The result of these high prices is that most ISPs choose to use international satellite, sending their investments outside of the African continent and bypassing the rent-seeking prices of their own incumbent telecoms.

The Club Consortium model leads to high prices for consumers and it also limits profit opportunities for both the private sector as well as governments. Since cheap communication, like good roads, is a central infrastructure to nearly all business ventures, these high prices are just another set of barriers to private sector innovation. Former telecom monopolists and their allies within government, by keeping access to information expensive, are limiting the potential windfalls that would result from the increase in users at lower prices.

There are two prominent political economy reasons why these poor arrangements stay in place. First, thousands of people are employed by these state-run telecom companies; which often run a deficit because of their inefficient operation. Politicians do not want to risk losing the votes of those who would lose their jobs from privatization. Second, African nations have notoriously weak regulatory bodies. Partly because of the lack of in-country expertise, and partly because of cronyism, regulatory commissions formed to promote competition often protect the profit margins of the incumbent telecom, limiting the ability to offer cheap and effective service.

The Open Access Model

The Club Consortium model represents the status quo: it is the only model that exists in Africa. However, when serious discussions began over the best way to provide submarine fiber in East Africa in 2003, some believed the region could steer clear of many SAT-3 pitfalls. Unlike Club Consortium, which thrives on centralized power and limited competition, the far better Open Access model places a high value on the most information reaching the most people. Open Access values competition and innovation, but also recognizes that in the East African context, the market cannot solve every problem. Therefore, a defining characteristic is that government will ensure that any ISP, NGO, or university can access the cable at the same rate. In this sense, the Open Access model recognizes, in line with the ICT4D community, that information is a public good. However, the model primarily utilizing a 'Bottom of the Pyramid' business model, which argues that service provision to the poorest members of society can an economically viable enterprise.

Unlike the Club Consortium model, Open Access has three distinct levels of ownership and service, with governments and the market playing differing roles at each level (Spintrack 2005). The transnational cable itself would be owned by a group of private investors and a public entity. This public entity could be an international organization such as the World Bank or a regional institution such as the New Partnership for Africa's Development (NEPAD). This public investor would ensure that ISP's, universities and NGO's all pay a fair price for access. The second level of ownership is that of the national entry point—where the cable enters a country—and the subsequent connection to a subterranean national infrastructure. Open Access envisions a transformative role for the incumbent national telecom at this level. Finally, the service level would be "technology-neutral," allowing providers of a wide range of data and voice services to purchase wholesale access (Spintrack 2005).

In the Club Consortium model, the regulator and the incumbent telecom on the service level were closely linked. Since new market entrants were often competing with the incumbent telecom, there was little incentive for stringent regulation or real competition. Under the Open Access model, the incumbent telecom no longer has to compete with new market entrants, thus decreasing the incentive for slackened regulation. In its new, more dynamic role, this national telecom no longer directly provides service, but instead becomes an infrastructure provider. According to the Information Development program:

> Depending on the history of the historic provider, [transitioning to an infrastructure provider] would be more or less difficult. The process will be relatively straightforward for historic providers that remain government-owned and set up operationally separate "business units" that are profit centers. But it will be more difficult for historic operators that still merge operations and cross-subsidize parts. If the historic operator has already been sold off in part or in whole, this may mean that the issue will have to be tackled in policy and regulatory terms (Spintrack 2005, p. 12).

This strategy has obvious payoffs in urban markets, where service provision is already competitive. However, at the rural end, national telecoms will have to partner with public interest groups like NGO's who can provide initial connectivity. With the national telecom working towards providing infrastructure throughout the state and not directly providing service, the regulator will have less incentive to create an uneven playing

field. This infrastructure provider can focus on creating a technology-neutral connectivity cloud (McGlaughin 2003, p. 30). Since broadband Internet is a versatile technology, the same physical infrastructure can support Internet access, 3G mobile service, and even Voice Over Internet Protocol (VOIP). With several levels of services being offered, the private sector would benefit from lowered barriers to access and end the need to compete with the giant national telecom. Meanwhile, the national telecom would benefit from an increased level of traffic on the infrastructure level. Finally, the consumer would benefit from lower prices and more choices of access resulting from increased competition.

Three Challenges to Open Access

The previous section attempted to demonstrate why an Open Access model will benefit urban consumers, rural end users (with the help of the ICT4D community), government, and the private sector. However, there are three looming challenges that must be overcome to make Open Access a reality. First, since Open Access requires horizontal technology-neutral regulation at the service level, there will need to be an increase in collaboration among government departments that historically have been unwilling to collaborate. For example, most East African nations have a ministry of communication that handles telephone issues and a ministry of science and communication that handles data and hardware issues. Increasingly, these two ministries will need to work together, as communications tools such as mobile phones begin to offer the same service as data processors such as computers. This is difficult because of many of these governments' lack of expertise but must be accomplished to create an effective regulatory regime for competitive Internet services.

The second challenge is to convince decision makers that the high initial price of laying cable is worth lower prices in the long term. As previously mentioned, most of the Internet connectivity in East Africa currently travels via satellite. This is the source of the high prices and low speeds for Internet access in the region. Some experts argue that the demand in East Africa will never be high enough to justify the massive investment necessary to build a submarine cable in East Africa (Resor 2007). These experts believe that governments and NGOs are better off subsidizing satellite connectivity. However, this approach will do little to make Internet access a major driver of economic growth and will ensure that demand in rural areas remains limited.

The third obstacle to the Open Access model comes from VOIP, what many African governments consider the third rail of Internet broadband

provision. VOIP is an application that allows voice packets to be transferred over a broadband Internet connection. With competition open to any technology at the service level, the governments fear that VOIP applications like Skype will be threatening for two reasons. First, they fear VOIP will spell the end of the incumbent telecom and eventually the prominent mobile operators. Second, they fear the currently notorious difficulty tapping VOIP services like Skype, which sends packets of data not through a local ISP but through Skype headquarters in Luxembourg. In many ways, this challenge is representative of the "Dictator's Dilemma," which puts governments in the difficult position of deciding whether they want open communication to promote economic development or whether they want to control communication to ensure their own political stability (Kedzie 1997). A practical approach is to temper the fear of broadband by urging governments to improve access while keeping VOIP illegal for now. In the longer term, as governments become comfortable in their new role as national infrastructure provider, they should see financial gain in maximizing the number of internet services provided.

POLICY IMPLICATIONS AND RECOMMENDATIONS

By adopting the Open Access model and advocating for it in economic and business terms, the ICT4D community can most effectively help East Africa gain the widest and cheapest access possible. The Open Access model, as previously argued, would significantly increase competition in urban areas where the demand currently far exceeds the supply of services. In rural parts of Africa, however, the lack of demand is a disincentive for the private sector to offer information solutions. Ironically, rural populations have the most to benefit from increased information opportunities. Proponents of Open Access have described the challenge facing the rural poor as the "chicken and egg" problem: rural communities remain uncompetitive because no large investor is willing to invest in infrastructure and service provision, while at the same time connectivity will go a long way in making these rural communities more competitive (Information for Development Program 2005).

Reaching rural end users requires a focus on both infrastructure and also training. ICT4D practitioners should focus on both elements. An innovative new strategy that counts on collaboration between small businesses and ICT4D NGOs is called "Incremental Infrastructure." Incremental infrastructure is an approach that focuses on mitigating the huge startup costs preventing governments and private corporations from bringing services to rural areas. Incremental infrastructure projects have

three components. First, they are atomic: each piece of the infrastructure is useful without the larger network. Second, these projects have lower initial startup risks because users finance them, in part. Third, they provide services previously unavailable (Zuckerman 2007). The low price allows ICT4D NGOs, in collaboration with small businesses, to provide small bits of rural infrastructure and service.

The ICT4D community should also impress upon governments that within the Open Access framework they can provide incentives to private companies willing to build using the incremental model. The small initial cost associated with building out connectivity to only a handful of villages will be far less of a financial risk to take then buiding infrastructure for an entire rural region. Alieu Conteh's investment in the DRC shows there is much promise in offering service at an incremental level.

Finally, ICT4D NGOs should play a more direct role in training rural end users. For example, take the Collecting and Exchange of Local Agriculture Content (CELAC), a project of the Busoga Rural Open Source Development Initiative (BROSDI) in Uganda (Bennett 2007). CELAC's foundation is a set of knowledge collectors who seek out best practices and other tips for increasing agricultural productivity for a group of farmers in Busoga. Farmers learn how to access and search for information at a small internet café CELAC set up, and all share information via radio and mobile phone. BROSDI has determined that this information has improved farmer output and, further, that rural farmers came to understand the value of technology for information sharing. By a targeted approach to reaching rural end users, instead of a broader mandate, ICT4D practitioners can reach users that many consider untouched and untouchable by digital technologies.

CONCLUSION

From the poorest farmer in rural Uganda to the business leader in Nairobi, everyone in East Africa has much to gain from cheaper and more widely available Internet access. The current lack of infrastructure has been the main reason the ICT4D community has had limited effectiveness in increasing its programs. This community must join the fight for Open Access, an Internet infrastructure policy paradigm that would benefit urban and rural users, the private sector, and governments. At future conferences, the ICT4D community should lobby international organizations, such as the World Bank and United Nations Development Programme, to contribute part of their human security budgets to one or several of the Open Access policy models currently in search of funding.

NOTES

Throughout this article, the term human security term is used in place of international development because it casts a wider net to the group of practitioners who are enthusiastic about ICT4D.

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