

The Internet and Business Process Outsourcing in East Africa

Value Chains and Networks of Connectivity-Based
Enterprises in Kenya and Rwanda

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EXECUTIVE SUMMARY

Background and study setup

Internet connectivity is widely considered to be a game changer for knowledge economies of developing countries. The arrival of submarine fibre-optic underwater cables in East Africa in 2009 and 2010 is seen by many as a strong case in point. The fast evolution of the information and communication technology (ICT) landscape of Kenya and Rwanda that ensued has attracted the attention of actors from private investors, development agencies, NGOs, policymakers and many other groups. Kenya became a role model for its widespread adoption of mobile money services and a burgeoning ICT application development sector; Rwanda's government became known for its explicitly ICT-oriented development agenda as well as large-scale ICT projects in government, health and education that aimed to latch onto fast-growing mobile subscription rates and 3G network roll-outs.

For this report, we set out to examine the role that changing connectivity has played for a particular component of the ICT sector in Kenya and Rwanda: ICT-enabled business process outsourcing (BPO).¹ BPO has been a priority in the national ICT strategies of both countries, so we anticipated this sector to provide a fertile ground for comparing expectations and realities of the role that changing connectivity has played following the deployment of fibre-optic cable infrastructure.

BPO is also an interesting sector because internet connectivity is at the heart of its value chain: At first glance, fast internet connections should go a long way in bridging geographical distance and enabling Kenyan and Rwandan businesses to tap into continuously growing BPO demand from all over the world. BPO is also inherently a global, or at least a widely geographically distributed, industry. Our analysis was therefore designed to shed light on the risks and opportunities of establishing connectivity-based local sectors that are bound to be exposed to international markets and competition.

We used an analytical framework that honed in on the effects of increased internet connectivity on the value chains of the BPO sector. Since we wanted to examine potential benefits and risks of changing connectivity for *local* BPO businesses in Kenya and Rwanda—that is, businesses that create and extract economic value through and for individuals regularly located in Kenya and Rwanda—we further examined the interaction of value chains with geography and the locations of different actors on those chains. We wanted to identify both the geographically contingent exchanges that happen along the BPO value chain and the exchanges that happen locally across the value chains of related sectors.

Our team of researchers from the Oxford Internet Institute developed a staged, in-depth analytical approach to elicit the expected and actual roles that changing connectivity played in the Kenyan and Rwandan BPO sectors. We first conducted a content analysis of 378 East African media sources to understand the hopes and visions invested in the arrival of fibre-optic cables. Once we started conducting interviews, we quickly found that mainly the Rwandan but also the Kenyan BPO sectors were less active than we had envisioned. We then included other kinds of ICT-based companies in our sample in order to understand the environment of the core BPO sector and potential barriers that had kept it from growing further. Broadening the scope also made sense as policymakers in both countries had come to recognize that the promotion of international BPO was likely to require more fundamental changes in the structure of their domestic economies. We ultimately conducted 102 interviews with policymakers and private sector representatives in both countries. Two open focus groups in 2013, in Nairobi and Kigali, were used to corroborate preliminary findings, and to disentangle inconclusive ones. A final workshop held in August 2014

in Kigali served to collect a last round of feedback from Rwandan BPO practitioners.

Findings

Relevant sectors and value chains

1. An active BPO sector was found to exist in Kenya but not in Rwanda. Even Kenya's, over a decade-old, BPO sector has not been able to capture large amounts of work from foreign clients, falling far short of original hopes and expectations.
2. Two additional sectors within local ICT industries have distinct value chains while also playing a role in shaping the BPO sector: ICT innovators (such as start-ups developing new applications and software) and ICT connectivity enhancers (such as electronic payment intermediaries).
3. The three sectors together (BPO, ICT innovators and ICT connectivity enhancers) can be summarized as connectivity-based enterprises: these businesses provided content and services through value chains and networks that depended on ICT infrastructure (hardware and software) put in place by local and international ICT corporations or government entities (such as subsidized/government-owned and private mobile network operators, device manufacturers, and software multinationals).

We first outline findings that apply specifically to the BPO sector, before outlining findings that hold more broadly across all three connectivity-based enterprise sectors.

BPO-specific findings

1. Diverse but persistent (re-)intermediation

The limited outsourcing opportunities that were available from international clients were usually subject to various forms of mediation: such as, through online platforms, through international consultants, through governmental or government-affiliated agencies or through impact sourcing agencies. Our observations also supported the idea of 're-intermediation'. Distributed work platforms like Odesk and elance, by virtue of their design principles, offer only certain kinds of barely-profitable and non-sustainable work in a 'take it or leave it' format. Better connectivity also allows international consultants and more powerful companies to re-package and re-distribute work to Kenyan and Rwandan companies that are lower down in the chain. Kenyan and Rwandan BPO actors believe that this intermediation lowers their margins and that a greater degree of disintermediation would benefit the sector.

2. Understanding the market forces of global BPO value chains and networks

As late follower countries for BPO, Kenya and Rwanda have faced strong competitive pressure from mature BPO industries in India and South East Asia. The local BPO sectors do not have the depth, scale efficiencies, cost-competitiveness and skill base to compete for international customers with established foreign BPO companies and markets. Due to a lack of international competitiveness, Rwandan and Kenyan-born BPO enterprises have largely expanded within their home countries or across Africa (for some Kenyan companies), where they can offer a better fit of supply and demand (defined by provided/demanded quality and price). At times, local BPO companies themselves "re-outsource" their work abroad, hiring foreign companies, as this can still be cheaper than doing it locally for large scale and complicated projects. In addition, subsectors of BPO do not always adhere to the same market dynamics, for instance, regarding available deal flow and required skills.

3. Gaps in workers' skills on multiple levels

Among the contributors to low competitiveness, shortages of human capital and skills stood out on multiple levels, even for parts of the BPO sector focusing on "low-skill" work. Mostly lacking were technical skills, but also limited soft skills were problematic. Higher education institutions appeared unable to fill skill gaps comprehensively and prepare a BPO work force. BPO providers often trained their employees themselves; however, this increased their cost.

4. Late-follower challenges

In both countries, the sectors went through a learning curve concerning the potentials and limitations of BPO work. The main learning outcome was that internet connectivity does not eliminate the need for direct, trusted interactions with clients and an understanding of their needs. Both continue to be easier to achieve in markets close to the BPO operator's own location or when temporary physical proximity (Torre, 2008) can be established (e.g. during shorter visits of international clients). It appeared no longer possible for Kenya or Rwanda to achieve the overwhelming scale efficiencies and trust advantages of Indian and other Asian operators. Notably, Rwandan interviewees expressed a firmer belief in the elimination of geographical distance due to internet-mediated connectivities. This might mean that internet connectivity is an initial hurdle that prevents managers from seeing other hurdles until it has been transcended.

Findings for connectivity-based enterprises

1. The importance of skills, learning and combinations of local and global knowledge

Value chains and networks of all connectivity-based enterprises relied heavily on learning and skill formation, in particular for technical knowledge such as in software development. Internet connectivity, through enabling access to open source software communities and resources, had a meaningful impact on enhancing the skills of Kenya's and Rwanda's work forces. Yet, hands-on mentoring, talent with complementary non-technical skills and exposure to new contexts and networking opportunities usually generated the greatest successes. International exposure in particular enabled actors to leverage the 'best of two worlds': local knowledge and superior skills. This meant that a small but growing segment of local connectivity-based enterprises, offering services to domestic and African markets, has been able to derive a palpable net benefit from improved connectivity. Over time, the value derived from internet connectivity and the value derived from ICT-related skills appear to have mutually enhanced each other.

2. Social connectivity and trust as necessary conditions for ICTs to bridge distances

ICTs could not replace or make superfluous the need to establish trusted social relations with clients and business partners to enable economic interactions. This was true even though value chains of connectivity-based enterprises were predicated on ICTs' distance-bridging potential. Connectivity-based enterprises engaged in value creation and extraction that served (end) customers at a distance (without face-to-face interaction), but any larger and more sustained economic transaction required the establishment of social connectivity and trust. Temporary geographical proximity between actors (for instance, during conferences or short in-country visits by international actors) was one initiator of ongoing transnational business relationships, but relationships were rarely "born online". Lacking conceptual connectivity—a collective and a priori trust between East African companies and foreigners—was often an important initial burden before any company would even be able to prove itself as trustworthy in a one-on-one relationship. The only exceptions were internationally operating companies where trust was established via alternative pathways (such as the company's brand and reputation or broader contractual arrangements).

3. Domestic and regional markets as newly found opportunities

Companies in all three sectors were largely focused on businesses generated within Africa. In Kenya, businesses were mainly focused on Uganda, Tanzania, and South Sudan. Rwandan-based companies were focused on similar

countries, but also on the Democratic Republic of the Congo and Burundi. Increasingly, domestic and regionally proximate markets have revealed unexpected potentials, and have been developed into modest but sustainable and growing value creation and extraction opportunities.

4. Gateways and gatekeeping

Connectivity-based enterprises followed diverse pathways of transitions and upgrades, usually based on iterative increases in social connectivities and trust. By and large, the most prevalent expansion paths proceeded from local to regional to global, and rarely was a 'born-global' strategy realistic. Small Rwanda- or Kenya-based businesses often began with one formal contract with a foreign client that helped them to establish themselves. Foreign large companies typically entered the Rwandan or Kenyan market through tenders for large projects. ICT innovators would start with website design or international and practical exposure and sometimes flourish from there. Government and large institutional actors occasionally acted (unintentionally) as gatekeepers towards smaller firms through rigorous tendering requirements.

Recommendations

Our findings led us to derive a set of recommendations for government agencies, policy, industry associations and development organizations that aim to foster sectors of BPO and connectivity-based enterprises.

1 Building skills on multiple levels

Connectivity-based enterprises in Kenya and Rwanda face a large gap between their skill demand and the available supply. Beyond technical expertise, management and soft skills are lacking and hamper businesses' productivity and competitiveness. Higher education needs to provide graduates with more comprehensive and applicable skill sets. Public private partnerships between universities, training institutions, enterprises and government could help students, freelancers and junior employees improve their job and income opportunities.

2 Identifying a competitive edge for the local sector

When attempting to support a globally active local sector that is already well established in other countries, policy should carefully weigh what competitive advantage the local sector will have over foreign competitors. Labour cost advantages might not be sufficient and might not outweigh scale efficiencies and learning advantages that foreign competitors have already established. Competitiveness might rather be derived from unique knowledge of, and access to, local and regional markets. A lack of local knowledge can also be a barrier for international companies coming into these markets. Government incentives, such as funds and subsidies, can be an option, but they need to be based on a realistic and in-depth assessment of local businesses' competitiveness and opportunities for value creation and extraction.

3 Adopting a holistic perspective across sectors

When establishing a connectivity-based enterprise sector such as BPO, policy needs to pay particular attention to other sectors that have related value chains and rely on similar input factors. Beyond internet connectivity, skills, reputation, regulation, the availability of mobile and electronic payments, access to risk finance and several other factors matter as enablers for connectivity-based enterprise sectors. Vicious and virtuous circles within and across related value chains have to be considered.

4 Considering social connectivity beyond internet connectivity

There is an important difference between *accessibility* and *being accessed* through the internet. Connectivity-based enterprises, like any other business, rely on the awareness and the trust of their customers, suppliers, and partners to be able to make contracts and deals. These social factors are usually best

established through personal contacts and social relations, which are rarely 'born online'. Enabling temporary geographic proximity and venues for face-to-face interaction—for example, during events, conferences, and business and outreach trips—thus remains an important goal for governments and industry associations, even in the BPO sector.

5 Building a sector's reputation

By definition, connectivity-based enterprises work with customers and suppliers that are in a different location, so that trust is particularly hard to establish and sustain. If clients are generally sceptical of a country's sector, an individual enterprise will find it difficult to obtain a chance at proving itself. Government agencies, policy, and industry associations have a role to play in ensuring a good overall reputation of a sector. Certification programs could be one important lever. Another way might be to set up platforms that enhance matchmaking, accountability and the enforceability of contracts.

6 Setting realistic expectations for collective learning

Implementation of technological infrastructures, including ICT and internet connectivity, is important, but actors need time to experiment and iterate through generations of value chains and networks that work for their context. Competitive advantages need to be identified and tested, and risks need to be taken. Policymakers and institutional actors need to allow for collective learning and knowledge spillovers between different actor groups and between different geographies and social contexts to support iterative improvements and adjustments.

Conclusions

Our study outlined how policy, popular discourse and media got somewhat carried away by the promise of internet connectivity as the fuel for the growth of Kenya's and Rwanda's BPO sectors. The development of ICT sectors fell short of many original hopes. Internet connectivity proved to only function as a catalyst for economic growth in combination with other enablers, even for the examined sectors of connectivity-based enterprises. Competitive advantage is always relative, and, in the case of Kenya's and Rwanda's BPO sectors, India and other Asian BPO destinations have maintained the edge in international markets. Despite the overall positive evolution of ICT-based subsectors in Kenya and Rwanda, the role of internet connectivity for growth in knowledge economies continues to be a complicated one, including for connectivity-based enterprises. Future opportunities might actually lie in 'close' (local and regional) markets, and policymakers and indeed all economic actors will need to continue to learn and adjust to other unexpected developments brought about by internet connectivity.

1. INTRODUCTION

How does a US-American customer of a Dutch insurance company find herself speaking to a Rwandan call centre operator in Butare? How did the information she conveys with her voice end up being packaged as data, routed through myriad wires and switches in dozens of countries, ultimately traveling thousands of miles, when she just had a simple question about her insurance policy? At face value, examples like this one—now a common experience for consumers—show us that information and communication technologies (ICTs), and in particular the internet,² have created awe-inspiring means to bridge geographical distance, in this case for a business seeking to access low-cost labour in low-income countries.

Yet, if we probe a little further and ask "Why this particular call centre and why Rwanda?" or "Why do we see such outsourcing in some industries and for some tasks but not for others?", the potential explanations immediately become more complicated. Maybe there was a subsidy, or maybe Rwandan service workers were deemed to be particularly skilful for this sort of work compared to workers in other countries, or maybe a procurement specialist for the insurance company happened to meet a representative of the Rwandan Development Board (RDB) at a conference, who later brokered a deal with the call centre manager. In short, if we start thinking through questions around the dynamics of globally distributed flows of information and value creation, we quickly see that even the simplest interactions can be preceded by intricate, complex and socially embedded interactions and decision-making processes of economic actors.

This report examines if and how the internet can enable development of an industry that is predicated on bridging geographical distances between low-income and high-income countries via ICTs: the business process outsourcing (BPO) sector.³ We selected the local BPO sectors of Kenya and Rwanda as case studies for a number of reasons. Both countries have sought to benefit from an incisive event for the ICT landscape of East Africa: the arrival of the region's first submarine fibre-optic cables to the coasts of Kenya and Tanzania in 2009. Our research team felt that this large-scale upgrading of internet infrastructure offered a unique opportunity to empirically examine the short and medium-term effects of ICTs on economic development, and also to compare visions and hopes with the realities that have materialized over the last five years. Moreover, policymakers in both countries have singled out BPO as a potential game changer for employment opportunities and economic transformation. This means that the sector could serve as an important test-bed for the hopes around global connectivity and integration wrapped up with the arrival of the cables.

As our introductory example suggests, concrete contexts and histories shape the ways in which actors engage with technology, and thus needed to be taken into account for this analysis. Even more importantly, the present case is an industry that is inherently based on interactions between actors that span (sometimes very large) geographical distances, and so we found it useful to hone in on the very notion of 'connectivity'. In other words, while much popular discourse around globalisation paints a picture of individuals seamlessly connecting to other individuals on the other side of the planet once infrastructure is in place, it is essential to remain sensitive to the intermediating influences that build cognitive and perceptual connections between actors: connections that are based on technological connectivities.

Ultimately, we needed to broaden our understanding of connectivity far beyond *internet connectivity*, in the sense of mere technology-enabled accessibility. For us, the focus was the real changes in opportunities and outlook of economic actors, and so we saw enhanced internet access only as a means to desired ends, such as business deals, increased revenues, employment, learning, economic inclusion, integration and transformation, and so forth. This meant that we examined the more far-flung effects of the new technological

infrastructure in East Africa by also scrutinizing changes in actors' *social and conceptual connectivities* (Graham & Mann, 2013) as well as *enablers* that are complementary to internet connectivity.

The project used a value chain and value production network perspective (Gereffi et al., 2005; Coe, Dicken & Hess, 2006) to analyse the relations between any actors involved in 'bringing goods to the market'. We also employed ideas of (dis)intermediation and positionality in order to conceptually underpin some of the work (French & Leyshon, 2004; Graham, 2008; Klein & Werthner, 1999). Several of the arguments made in this report, including the idea of conceptual connectivity (a collective and a priori trust between East African companies and foreigners), were articulated earlier for an academic audience in a paper published by two of the authors (Graham & Mann, 2013).

This conceptual focus is also at the heart of two important clarifications concerning the scope of this report. First, we broadened our sample beyond just BPO enterprises to include a broader array of ICT companies. This was necessary because we quickly found that only a limited amount of BPO work was actually taking place in both countries. This broadening of focus was also useful because we saw that the value chains and networks of BPO companies were closely related and interconnected with other subsectors of local ICT industries. Second, we were interested in economic opportunity created through BPO, and so the locus of value creation and extraction, as well as (working) conditions for the involved actors, mattered.

The report is a unique contribution as an in-depth analysis of impact of changing connectivity on an inherently internet-reliant, high-profile industry in low-income countries. This is a different approach than previous studies that have mainly focused on the positive impact of ICTs when they are applied to existing sectors in African economies (Aker and Mbiti, 2010; Chowdury and Wolf, 2003; Donner, 2005, 2007; Moloney, 2007, 2008a, 2008b; Morawczynski and Ngwenyama, 2007; Morawczynski, 2009; Mihasonirina and Kpodar, 2011; Waverman et al., 2005).

The report is structured as follows: As context and background, chapter 2 gives readers an overview of Kenya's and Rwanda's ICT landscape, charting out the infrastructural conditions that the emerging BPO sectors have sought to latch onto. Chapter 3 includes a short literature review and describes our analytical approach based on the value chain and value network concepts. Chapter 4 summarizes our data collection and methodological approach. Chapters 5 to 7 present our findings, starting with the categorization of subsectors relevant for understanding the BPO value chains and networks, followed by in-depth analyses and a discussion chapter. Chapters 8 and 9 provide our policy recommendations and conclusions.

2. INTERNET CONNECTIVITY AND GOVERNMENT POLICY IN KENYA AND RWANDA

Before delving deeper into the analysis of value chains and networks in the Kenyan and Rwanda BPO sectors, it is necessary to arrive at a basic understanding of the ICT infrastructure and policy conditions in both places, as well as high-level information on the BPO sector and the governments' BPO-related policies. Concerning the bigger picture around the arrival of the undersea fibre-optic cables as well as Rwanda's and Kenya's ICT infrastructure and policy, this chapter gives an overview, but readers can refer to other sources for more in-depth information.⁴

East Africa was the last major geographic region of the world connected to the global fibre-optic grid, but by 2010, three undersea fibre-optic cables connected the region to international networks.⁵ These cables brought the possibility of much lower internet costs and higher internet speeds to the countries of the region.

However, users were not automatically switched on after their arrival. The fibre-optic cables brought bandwidth to the ports of Mombasa and Dar es Salaam, but much work was, and is, needed to transport that bandwidth into homes and offices. Mobile telephony and wireless technologies have played a much stronger role for 'last-mile' access in Kenya and Rwanda compared to high-income countries: fibre-connected buildings use Wi-Fi extensively, and 2G+, 3G and most recently 4G mobile technology (from low to high bandwidth) has been deployed, enabling mobile internet access. Although the economies of such technology are more favourable to an East African context than the extensive roll-out of fixed-line internet infrastructure to individual households, the cost per connected user is still often prohibitive in sparsely populated areas, which limits scaling economies of networks at large (Williams, 2010), meaning that affordability issues remain for private households as for businesses.

The following sections look at the changing internet connectivity in Rwanda and Kenya. It also expands on how their respective economic plans, Vision 2020 and Vision 2030, have influenced the development of internet and ICT infrastructure. Rwanda and Kenya have very different patterns of internet connectivity, partly as a result of their geography and partly as a result of their governance structures.

Rwanda

ICT and internet infrastructure

Rwanda has witnessed a dramatic transformation in digital connections over the past decade. Almost all of the country (99.79%) is now covered by mobile telephony networks, with a subscriber base of over 5 million as of September 2012 (or 48.1% of the population) (RDB, 2013). The RDB projects that this number will expand to almost 7.5 million by the end of 2016. This transformation has taken place within the context of continuous GDP growth reaching 8.0% in 2012 (World Bank, 2013).⁶

While the private sector has undoubtedly been growing, it is important to stress that the Rwandan government has played a much stronger role in the roll-out of its country's internet infrastructure than the Kenyan government has in Kenya. With its small and predominantly poor population, the country was not initially attractive to international telecommunication companies seeking new markets. At the same time, Rwanda's relatively high population density implied that the country is suitable and amenable to subsidized or government-led infrastructure projects (see Friederici, 2013, for examples). The Rwanda Development Board (RDB) laid a national fibre-optic backbone that connected all towns and cities in the country, and constructed a lot of infrastructure in the capital city of Kigali through the Kigali Metropolitan Network. The government

also helped fund the entrance of the South African company, MTN into Rwanda (Booth and Golooba-Mutebi, 2012; Kelsall, 2013). While MTN still dominates, two other companies, Tigo and Airtel have since entered the market.

Even after laying the physical backbone, the government discovered that regional internet service providers (ISPs) were having trouble negotiating access to international connectivity from Kenya and Tanzania. It therefore opted to buy bulk capacity from international suppliers at wholesale rates for domestic redistribution. It has given responsibility over this bandwidth to the Broadband Systems Corporation (BSC), a private company in which the government is a majority shareholder. These interventions have made it possible for smaller ISPs to enter the market, particularly in areas with lower demand, resulting in slashed wholesale bandwidth costs that decreased by 75% (Government of Rwanda, 2012).

The government has also played a strong role in convincing the international payment company, Visa to choose Rwanda as its African headquarters. In 2011, the company introduced the Rwanda Integrated Payments Processing System, thus facilitating electronic payments within the country (Crisafulli and Redmond, 2012). This system has now been integrated with wider regional payment systems like the East African Economic Community's (EAEC) Common Market Protocol and the Common Market for Eastern and Southern Africa's (COMESA) Regional Payment and Settlement System (Maiyambere, 2012; Mbabazi, 2012). These integrations are intended to prepare the country to become a regional trade and financial hub.

High-level policy strategy for BPO sector

Concrete and reliable information on the size and shape of the Rwandan BPO sector is scarce. One estimate by the private sector consultancy On the Frontier Group (OTF, 2010, as cited by The New Times Rwanda, 2010) held that the sector would grow from USD29 million in 2009 to USD274 million in 2020, with the RDB citing similar figures in unofficial documents (RDB, no date). However, no information is available on the methodologies and assumptions underlying such estimates. In this section, we therefore only briefly highlight the Rwandan government's high-level approach to BPO.

The government's hands-on role in the Rwandan ICT and internet industry is based on its goals to generate ICT-led economic growth. These ambitions are outlined in the government's national development plan, Vision 2020 (Government of Rwanda, 2000), focusing much more explicitly on ICTs than most other countries' economic development policies.⁷ The plan's overarching goal is to build a knowledge-based economy and make Rwanda a middle-income country by 2020. As Rwanda lacks natural resources, it has strongly emphasized the education and skill development of its people.

In this context, the Rwandan government has identified BPO to have particular potential to generate economic growth. However, Rwanda's strategy differs markedly from that of Kenya. Instead of supporting the establishment of new Rwandan BPO operations, the goal is instead to nurture existing firms with BPO potential (in niche fields) and aim to attract international BPO players.

The government has attempted to implement this vision for the BPO sector with two broad strategies. First, the government (via the RDB, the Ministry of Youth and ICTs, and the Rwandan ICT Chambers) seeks to attract large international companies to set up regional headquarters in the country and help upgrade the country's infrastructure.⁸ The government hopes Rwandan workers and businesses will benefit from these arrangements through knowledge transfer and revenue-sharing arrangements.

Second, the Rwandan government has sought to encourage entrepreneurship and private sector development from within the country. It established the Kigali Institute of Science and Technology (KIST) to boost the country's number of advanced technology students. Students are sent abroad for training in advanced engineering,⁹ and the government convinced Carnegie Mellon University (CMU) to open a graduate degree program for East African students in Kigali. A technology innovation hub, k-Lab, was financed by the government, with the goal to spur technology entrepreneurship among Kigali's tech-savvy youth.

Kenya

ICT and internet infrastructure and policy

Kenya's story has been significantly different from Rwanda's. Besides its own investment in the TEAMS cable, the government has largely allowed the private sector to spread mobile telephony and internet connectivity to its population. The main mobile network operators driving infrastructure deployments are Safaricom, Airtel, Essar and Telkom Kenya (operating under the Orange brand).

Even though the government's strategy to achieve its goals was different to Rwanda's, the overall goals are relatively similar. Like Rwanda, Kenya developed an overall economic development plan, dubbed Vision 2030 (Republic of Kenya, 2007a; 2007b). Although the focus on ICTs is not as explicit as in the case of Rwanda's Vision 2020, the Kenyan government also argued that the country should reduce its dependence on the agricultural sector and instead hone in on the export of services (Kenyan ICT Board, 2009). The arrival of fibre-optic cable in Mombasa was subsequently seen as an important enabler for this economic transformation. The policies were paralleled by an enhanced sense of optimism and an impending 'ICT revolution' (Graham & Mann, 2013).

Kenya is widely considered to be an East African success story in the realm of ICTs because of its status as a Pan-African 'ICT Hub'. Furthermore, it already is characterised by relatively impressive ICT penetration statistics. For the last quarter of 2013, the Communications Authority of Kenya (which succeeded the Communications Commission of Kenya) reported a mobile subscription penetration of 76.9%, a broadband penetration of above 3% and an internet penetration (using the broadest definition of 'internet') of 52.3%, of which 99% were mobile internet subscriptions (CAK, 2014).

The evolving BPO sector and policy phases

Compared to Rwanda, Kenya's BPO sector has a longer history. In this section, we therefore give a brief chronological outline of the changing state of the sector. We will focus on the broad strokes of government policies that accompanied the sector's evolution, leaving a more in-depth analysis of lessons from this history for chapter 6.

2007-2011: BPO as a key government strategy for economic growth
BPO was one of the six key sectors explicitly highlighted in the Kenyan government's Vision 2030 (Government of Kenya, 2007a; 2007b). In 2007, before the arrival of the cables, the BPO sector in Kenya employed only about 4,000 people, contributing about 0.01% to the nation's GDP (Republic of Kenya, 2007a; Omondi, 2012). Still, BPO was estimated to ultimately create at least 20,000 direct jobs and contribute 10 billion Kenyan shillings (USD120 million) to the country's GDP; this economic impact was expected to be generated both by Kenyan firms and large multinationals. The hope was that BPO would become the "sector of choice [for] employment among youth and young professionals" (Republic of Kenya, 2007a: 81).

Envisioning Kenya as the top digital offshoring destination in Africa, the government called for the creation of a 7,500 seat 'BPO park' at the Athi-River Export Processing Zone, an aggressive marketing campaign, the development of targeted training programmes, the development of a BPO incentive

framework and initiation of a BPO and Contact Centre policy.¹⁰ The government also established the semi-autonomous Kenya ICT Board, which, among other goals, was set to promote the BPO sector.

Like the Rwandan government, the Kenyan government intervened to reduce bandwidth costs, but it focused more directly on the BPO sector. In 2007, the Kenyan government used 78 million Kenyan shillings (about USD920,000) from the World Bank Transparency Communication and Infrastructure Programme (TCIP)¹¹ to subsidise the cost of satellite bandwidth for BPO companies while the country waited for the East African submarine fibre-optic cables to arrive. This case illustrates that the government put much emphasis on BPO over other ICT subsectors: it effectively used funding that was originally earmarked for e-government to promote the BPO sector.

In 2009, the government commissioned the consulting company McKinsey to compile a report on Kenya's niche within the global market for BPO/ITES (Kariuki, 2010). It confirmed that Kenya could become competitive in niche call centre and customer service work, stressing, in particular, the neutral English accent of Kenyan graduates. The Kenya ICT Board also visited countries such as India and the Philippines to learn how these countries had developed their BPO sectors. The Board's immediate mission was to find and develop Kenya's particular national comparative advantage vis-à-vis other destinations in the world.

2011 onwards: a shift towards high-value added ICT services

Following the first experiences after the arrival of the cables, the government started to change its approach. In particular, it shifted attention away from call centres to higher-value producers like software engineers, most visibly in the celebration of cases like M-Pesa¹² and Ushahidi¹³. Government officials also began to realise the potentials of automation to centralise rents and reduce corruption (Mutai, 2013). For example, in an interview, the Permanent Secretary of ICT, Bitange Ndimo revealed how the automation of the Land Ministry had increased government revenue from KSh800 million (USD9.6 million) to KSh8 billion (USD96 million); he was keen to automate other government services.

In line with this tendency to take other ICT-based industries into account, by 2012, the Kenyan ICT Board had changed its mandate from promoting BPO to promoting ICT services at large. Similarly, the 7,500-seat BPO park in Athi River was re-conceptualized as 'Konza City', a more general kind of 'technopolis'. BPO, for instance, was only mentioned in passing at the ground breaking ceremony in 2013. The Kenyan government has also started to engage more actively with the emerging entrepreneurial and ICT startup communities forming around the iHub and other technology innovation hubs in Nairobi (Gathege & Moraa, 2013; Graham & Mann, 2013). For example, the Kenya ICT Board, with support of a World Bank loan, funded the Nailab business accelerator, located in the same building as the iHub, in early 2013. In sum, the Kenyan government has largely shifted away from its narrowly focused promotion of BPO towards the encouragement of broader ICT entrepreneurship and the modernization of its public services and government programmes.

3. VALUE CHAINS AND VALUE NETWORKS

In this short chapter, we will outline the theories and analytical perspectives that we used to analyse the BPO sectors of Rwanda and Kenya. Namely, we are drawing on a value chain / (global) value production network perspective (Gereffi et al., 2005; Coe, Dicken & Hess, 2008). In the following, we first give brief pointers to additional important concepts and streams of literature—including ICTs and distance, and (dis)intermediation and trust—before we describe value chain / value network ideas in more depth.

ICTs' role for distances, (dis)intermediation and economic opportunities

Many authors have pointed to the ways that ICTs can help economic actors transcend geographical or political barriers, with those in economically marginalised areas seen to be afforded tools to overcome spatial isolation and exploitation (Graham & Mann, 2013). Such proclamations often use metaphors like the 'global village' (McLuhan, 1968) or the 'death of distance' (Cairncross, 2001). While such proclamations are often repeated in popular media and casual conversations, we would instead look to more nuanced understandings of the intersections between ICTs, distance, and geography (e.g. Graham, 1998). Technology does not unfold in a neutral way, but is shaped and informed by networks of actors who use it in unique and culturally specific ways in each geographical location and social context.

Contexts do not only impact technology; technologies also play a role in the production of space, place, and location. For example, ICTs are often described as 'reducing distance' and 'improving connectivity'. ICTs can also do the opposite, creating new barriers and new kinds of memberships. An increased capacity to communicate at a distance has the potential to both increase and decrease instances of face-to-face communication, and to stretch and shrink distance (see for example Morawczynski, 2009 for a discussion of M-Pesa, remittances and frequency of 'trips home').

ICTs have also been described as a potential source of disintermediation, allowing actors who do not reside in a proximate geographical or social environment to "cut out the middle man" and communicate and interact more directly and effectively. Yet, other research has clearly shown how ICT should in fact be understood through the concept of 're-intermediation'; the technology and innovations, their social configuration and their ordering systems have been created by humans, which can imply that the 'experts' involved in constructing these models and systems themselves replace older intermediaries as new intermediaries, in particular, in dynamic change and power perspectives (French & Leyshon, 2004; Graham, 2008; MacKenzie et al., 2007; Klein & Wertherer, 1999).

When the effects of ICTs on distance and disintermediation are applied to economic opportunities, offshoring and outsourcing industries immediately come to mind. In the past, the offshoring of jobs from one place to another was partly determined by the extent to which tradable goods produced by such labour could be packaged into 'boxes'. A distinction emerged between jobs in manufacturing and jobs in non-manufacturing. With the advent of contemporary ICTs and the internet, a new distinction is taking form instead, "between those types of work that are easily deliverable through a wire (or via wireless connections) with little or no diminution in quality and those that are not" (Blinder, 2006: 118). In particular for large ICT-based businesses, this means that both agglomeration and dispersion economies can be exploited, depending on task requirements like creativity, routinisation, the complexity of coordination, and the possibility of codification for a given task (Autor, Levy, and Murnane, 2003; Leamer and Storper, 2001; Malecki & Moriset, 2007; Moriset & Malecki, 2009).

The prime example for ICT-based offshoring is probably the emerging economies in Asia, which have been able to carve out niches as sites of technologically mediated service provision. India, in particular, by virtue of its well-educated and English-speaking workforce, has become the offshoring destination of choice for many companies.

However, even for India, as the nation widely acclaimed as the foremost BPO success story, closer analysis reveals a picture that is patchier than the ideal of equally distributed or inclusive economic growth. For example, urban, well-educated, middle-class and privileged castes dominate the BPO industry (Nijman, 2006). Such socio-demographic patterns can also have effects beyond their obvious implications for inclusion and exclusion of groups from opportunities, as they can translate into far-reaching consequences for society as a whole. For example, reverse migrants (i.e. Indians returning mainly from the US to start businesses and lives in India) can have markedly different political and ideological views from other Indians (Fuller & Narasimhan, 2006; Upadhyay, 2007). Finally, the vision of the BPO industry as a creator of choice employment for large numbers of people has not fully materialized: observations pointing to tight surveillance and heavy-handed management practices, such as the regulation of accents and identity, but also the repetitiveness of BPO work and its emotional cost have called this assertion into question (Bryson, 2007; Mirchandani, 2004).

Trust, reputation and conceptual connectivity

When we think more about the underlying mechanisms that let ICTs and the internet bridge geographical distances to enable economic opportunities, we discover that social connectivity is usually required beyond internet connectivity. If we think about the types of exchanges and deals in the BPO sector, it is easy to see that the two (or more) actors that conclude the economic transaction will have established some sort of social relation beforehand. The service provision itself (e.g. the call of a client of an insurance company being dealt with by a Rwandan agent) might be adequately described as a 'pure' information exchange between actors, but the economic interaction between BPO customer and supplier that necessarily precedes this service provision (e.g. an insurance company signing a service agreement with a Rwandan call centre) will certainly require a more sustained and socially embedded relation between actors, irrespective of them involving ICTs in this process.

In this context, trust between the parties plays a distinct role. Only if a minimum level of trust is present will business deals be concluded. Here, personal relationships might play a strong role, and brokers might be required to mediate between otherwise unacquainted customers and suppliers. One question for our empirical enquiry then is whether ICTs and the internet can help to establish such trust, or if other, complementary enablers need to establish the trust for ICTs to be able to afford their distance-bridging and shrinking potential.

However, beyond the trust that is manifest in personal relationships between actors, a country's, or a sector's reputation at large can play a strong role in attracting or discouraging economic activity. Foreign clients and investors will often apply preconceptions of 'BPO in Kenya' / 'BPO in Rwanda' or even just 'Kenya' / 'Rwanda', instead of going through the exercise of carefully contextualizing and differentiating between subnational regions, demographies, different service providers and so forth. This is arguably where national policy matters most, as it might have a more immediate effect on this broader, collective concept of trust and reputation. For instance, legal and regulatory frameworks might secure the faith of clients abroad in East African companies and entrepreneurs, or ratings and reports from international agencies might shape foreign (but also local) customers' broad-based perceptions. Importantly, given the symbolism and ideologies that policy and societies at large attach

to ICTs and the internet, these technologies can function as drivers of such 'conceptual connectivity', irrespective of immediate, palpable realities (Graham & Mann, 2013).

Value chains and value networks

The final, most important analytical concept that we employ concerns the ideas of value chains and value networks. Simply put, any activity that is involved in bringing a product or service to the market is meant to create an addition of economic value, which is added to the input factors. When distinct activities and tasks are involved and when they follow each other in a linear process in the production, one can think of a value chain. A value chain is thus an analytical device that can be used to show how different entities or different actors within an entity add value to a good or service as it moves from conception to distribution and consumption (Porter, 1985). Importantly, actors holding certain positions in value chains and value networks can generate strategic advantages, power or dominance over other actors in the chain or network.

These concepts are well-researched, and the literature on value chains is much more comprehensive than the overview presented in this outline. Gereffi, Humphrey and Sturgeon (2005), for example, developed an intricate typology of global value chains with five categories, ranging from 'market' to 'modular network' to 'relational network' to 'captive network' and then finally, to 'hierarchy'. This typology is based on the degree of explicit coordination required to structure interaction between actors in the value chain.

Their model can be interpreted as a way of charting the level of direct coordination required in different market settings. In some industries, overt hierarchical control is needed to bring goods to the market, while in others the price mechanism or the support of intermediaries can suffice. Setting structures and (national) standards and frameworks for value chains can be a means to establish a minimum quality and accordingly a national or sector brand (Gibbon & Ponte, 2005).

When we assume that this process is less linear and closed off, and that multiple different actors get involved in a particular element of the chain, one can speak of value networks. For instance, Coe, Dicken and Hess (2008: 6) argue that "[i]n reality, each stage of a production chain is embedded in much wider sets of non-linear/horizontal relationships". While it is prudent not to get too weighed down in terminology, the utility of the 'value network' concept is that it encourages reflexivity about the wider social, political and cultural environments in which producers and consumers find themselves. In particular, we can easily think of examples where value chains of related firms and sectors, locally and globally, have intricate interactions with the value chain of a particular firm, forming value networks at various levels.

This report uses these two concepts, value chains and value networks, to analyse the impact that changing internet connectivity has had on the Rwandan and Kenyan BPO sectors and the economic opportunities within them. With a physical commodity like tea, it is usually easy to point to places on a map and say, 'This is where these activities are located'. When it comes to ICT services, it is a little harder to envision the value chain, both geographically and procedurally. Information flows through digital networks, and while these digital networks have a tangible geography (in the form of wires, satellites, servers, or IP addresses), they are more difficult to pinpoint as geographical flows on a map.

Instead, it can be more useful to ask how much of the created value is captured or extracted (for example, in the form of wealth, salaries, earnings, jobs) within geographical entities (like Kenya or Rwanda) or organisational entities. If Rwandan and Kenyan policymakers and businesspeople want their countries to become important destinations for ICT industries, they need to have a grasp of how value creation and extraction in value chains works, and how different

market structures or forms of state intervention might change where and how value moves.

This report integrates these ideas around ICTs and geographical distance, re-intermediation, trust and conceptual connectivity, as well as value chains and networks, to analyse the changes that the arrival of the fibre-optic cables in East Africa have brought about for the Kenyan and Rwandan BPO sectors. It will show where and how value creation takes place, and also who is able to extract value. We will draw out commonalities between the two countries, and will summarize (1) how our respondents perceived the changing connectivity's impact on geography and geographical distance; (2) how changing connectivity has changed access to information and abilities to communicate and conduct economic exchanges directly and indirectly with other local, regional and international actors; and (3) how changing connectivity has impacted value chain and network configurations.

4. METHODS AND DATA

This chapter describes the four stages of methods employed in our research. A team of researchers from the Oxford Internet Institute, University of Oxford, developed an in-depth analytical approach to capture the expected and actual impacts of changing connectivity in the Kenyan and Rwandan BPO sectors. To systematically examine expectations, we conducted a content analysis of media articles discussing the arrival of the fibre-optic cables in the region. We also reviewed important policy documents, such as Rwanda's Vision 2020 and Kenya's Vision 2030. In 2010, we also conducted 20 interviews with policymakers from BPO firms in Nairobi and in Kigali to further inform the project and the design of the survey instrument. We will briefly outline the methodology for the content analysis here, but will not discuss the setup stages of our research extensively in the present report; instead we refer readers to Graham and Mann (2013) for details.

As the main data collection method for the present report, two of the authors, together with local partners from the University of Nairobi and the University of Rwanda, carried out 102 in-depth, semi-structured interviews with a range of actors in the BPO sectors and ICT-based businesses of Nairobi and Kigali. We adapted our data collection method and participant sampling throughout the process, before focusing entirely on the data analysis in the last year of the project.

Preliminary research: Discourse and content analysis

Before we set out to collect information directly from participants, we conducted a content analysis of East African media sources to understand the hopes and visions invested in the arrival of fibre-optic cables in the region. We made use of keyword searches in the Lexis-Nexis online database in order to select media accounts of the arrival and perceived impacts of the fibre-optic cables. Specifically, we identified articles that mentioned broadband internet in close proximity to a mention of either an East African country or one of the fibre-optic cable providers.

The result was a sample of 378 international and East African media reports about the landing of the cables. The sample was developed to be broad enough to cover a potentially diverse range of discourses and themes, yet small enough to be handled qualitatively so that not only manifest content but latent meaning could emerge from the analysis (Shoemaker & Reese, 1996: 32). We supplemented these texts with an examination of the national development plans of all East African nations and speeches given by heads of state about the arrival of fibre-optic cables.

Participant selection and sampling

Data collection during fieldwork was mainly done through interviews with BPO and other ICT-based businesses, policymakers and representatives from private sector associations in both countries. In Kenya, these interviews included representatives from the Kenya ICT Board, Bitange Ndumo (at the time, the Permanent Secretary of ICT), an adviser in the National Communication Secretariat, the Head of the Communication Workers Union, and representatives from iHub, mLab East Africa and 88mph (three tech hubs and business accelerator programmes in Nairobi). In Rwanda, the team interviewed Dr Ignace Gatare (at the time, the Minister for Youth and ICT) and representatives from the Rwandan ICT Chambers, the Rwanda Utilities Regulatory Authority, the Rwandan Development Board and kLab (an innovation and incubation hub in Kigali).

In total, 53 interviews were conducted in Rwanda and 49 in Kenya, for a total of 102 interviews (each 1-4 hours in length). All interviews were conducted in

English. Exploratory surveys with workers in Kiswahili and Kinyarwanda were also used to get a sense of the experience of workers and developers in both countries.

In all cases, the researchers sought informed consent from participants and asked permission to record the interviews. Occasionally, an interviewee would ask that the researcher treat particular parts of the interview as sensitive. In these cases, great attention has been paid to alert the team as a whole to handle and interpret this material carefully. Some individuals also preferred their interviews not to be recorded, in which case the researchers took detailed notes.

With the exception of public figures, specific interviewees have been anonymised throughout this report and in related publications in order to protect the confidentiality and privacy of participants. Many interviewees revealed the challenges of discussing failure in public forums and viewed the research project as an opportunity to air more critical views. This was particularly true in the ICT innovator sector (see chapter 5 for details), where entrepreneurs are under intense pressure to project success and optimism about their businesses. Our sense was that this confidentiality allowed participants to be more honest and less guarded in their interview responses.

Towards the end of the data collection period, two open focus groups were held in Kigali and Nairobi in May 2013, in which research participants and other interested parties were invited to reflect on preliminary findings. A final workshop held in August 2014 in Kigali helped to disseminate our research and to collect a last round of feedback on our findings from Rwandan BPO practitioners that we incorporated in this report. As these sessions were open, representatives from additional organisations also attended.

Interview guide

The initial interview guide was underpinned by three research questions. First, *how did respondents perceive the impact of changing connectivity on geography and distance?* Second, *how has changing connectivity altered direct and indirect access to information and partners of economic exchanges?* Third, *how has changing connectivity impacted value creation and extraction in value chain and network configurations?*

Concretely, interviewees were asked about 1) their internet connection, 2) their expectations of internet connectivity, 3) their disappointment with internet connectivity, 4) their fears concerning internet connectivity, 5) the range, scale and geographical scope of their businesses, 6) their ideas about the shape of 'value chains' in their sector, 7) their strategies for getting new clients and for raising public awareness about their companies, 8) their experience of barriers that prevented them from accessing new markets and customers/clients, 9) their use of websites and social media, 10) their employment and recruitment practices, 11) their experiences and ideas about the education system in both countries, 12) their experience working with private sector associations and with government departments/policymakers, and 13) their experiences with processes of 'disintermediation' and changing geographies, resulting from internet connectivity.

Methodology adaptation

During fieldwork, the research team adapted both its initial sampling strategy and the interview guide to reflect the realities they found on the ground. For instance, we quickly found that the Rwandan (and to some extent the

Kenyan) BPO sectors were less active than had been envisioned. The team also became aware that the business models and strategies of companies that formed the BPO sector were still developing, and still trying to adapt to market conditions. In the period of our research, there was hence a lot of uncertainty and speculation in the sector about its evolution. For instance, one international BPO consultant felt that Kenya's BPO potential could be catalysed if a local BPO firm would get a large client and 'pull' other business into the country, or if a large multinational BPO company entered Kenya in order to do local work. For these reasons, we needed to interview additional actors who could help shed light on potential barriers and interactions between connectivities and enabling factors.

We then included other kinds of ICT-based companies in our sample. This broadening of the sample was based on an important emerging finding in our research: the value chains of other subsectors of local ICT industries formed interconnected value networks together with BPO value chains, and it was essential to look at dynamics outside of the BPO sector to understand the BPO sector itself (see chapters 5 and 6 for details). The adjustment of scope also made sense as policymakers in both countries had come to recognize that the promotion of international BPO was likely to require more fundamental changes in the structure of Kenya and Rwanda's domestic economies.

Particularly in Rwanda, where the BPO sector was at an incipient stage, we attempted to include companies that had the potential to engage in BPO in the future. We included a range of engineering, legal, financial and advertising agencies. Our researchers also sought out interviews with Rwandan telecommunication providers, due to their potential to become BPO clients in the future, and with local call centre and BPO providers. Similarly, in Kenya, we aimed at interviews with large multinational financial companies that were investigating the potential of the local BPO market.

Additionally, while the team had initially designed the project to analyse the impact of fibre-optic connectivity on East Africa's potential to engage in *international* flows of BPO work, the early fieldwork prompted a significant re-focusing away from the international market towards BPO work for actors in the *domestic* and *regional* economies. The team also discovered that most ICT innovators—a group included in addition to the BPO sector (see chapter 5)—were more interested in developing software for regional markets, even if they had the capacity to conduct coding work for clients from outside of the region.

Transcription, coding and analysis

After the fieldwork had been completed in both countries, two transcription companies were used to transcribe the recorded interviews. A Kenyan BPO company was employed to transcribe the bulk of the interviews, while a second, non-East African company transcribed interviews where there was a potential conflict of interest, namely for the interviews conducted with companies engaged in transcription work themselves.

Ninety-nine of the interviews were coded using N-Vivo, a qualitative analysis software package designed to allow users to organise unstructured text, and therefore examine relationships between ideas and statements in interviews. The researchers read through the transcriptions, coding areas of text where ideas or emerging themes were being discussed. This close coding of the interviews allowed the research team to identify common experiences and ideas shared across the sample of interviews, but also to identify interesting exceptions.

Methodological limitations

Our research team acknowledges the necessary limitations of the data collection and interview analysis methodology employed in this project. Transcribed interview data is vulnerable to misinterpretation and artefacts of imperfect expression—sometimes participants might not find the appropriate words to describe a complex economic dynamic. We also acknowledge that we sometimes used provocative and leading questions to stimulate discussion. For these reasons, the team has been careful not to take quotations out of context, but rather to reflect on how their interviewees expressed themselves throughout the entire interview process, clarifying earlier statements and ideas at later stages of the interview.

It was also sometimes difficult to differentiate between respondents' direct experiences and their anticipations and projections. Often, participants had clear opinions and ideas about the BPO sector and its evolution even when the extent of actual economic activity was unclear (indeed, this observation motivated our work described in Graham and Mann, 2013). In some ways, the fieldwork revealed that it was too early to conduct research about the impact of fibre-optic cables on the BPO sectors in East Africa, or that the question is in fact posed too narrowly to be answered in a meaningful way. Much more of the impact has potentially yet to come, and we found that it can be hard or impossible to directly associate the deployment of internet infrastructure with a clear, observable development pattern in a given ICT sector.

Finally, different interviewees could relate better to concepts such as 'value chains' and 'intermediaries' than others. BPO operators mostly grasped the notion of value chains and intermediaries without additional explanation while other ICT-based businesses found it harder to envision such chains. The latter were more likely to see themselves as acting independently from others and engaging in a disintermediated market. Similarly, some interviewees strongly identified with ideas about a 'flattened world', in particular software developers who engaged with open-source communities. These different experiences will be discussed in more detail in chapter 6, but it is worth noting how different experiences of connectivity were filtered through participants' engagements in particular kinds of work and information flows. The research team often had to adapt the interview guide on the spot, to account for these varied experiences. Different answers did not necessarily mean contradictions within the sample, but rather, different experiences even within similar sectors and fields. Our team took great care to contextualize each respondent's statements to account for this framing, but we cannot rule out the possibility that we sometimes generalized across participants who had very different understandings of concepts or terms that we were using.

5. VALUE NETWORKS OF CONNECTIVITY-BASED ENTERPRISES

Our research found that the BPO sectors of Rwanda and Kenya cannot be meaningfully understood only by examining the companies within each sector. An active BPO sector was only found to exist in Kenya but not in Rwanda, and even Kenya's over a decade-old BPO sector has not been able to capture large amounts of work from foreign clients; falling far short of original hopes and expectations.

These nascent clusters of economic activity were closely interrelated with adjacent subsectors of local ICT industries, even though their value chains were distinct. Looking at these interrelations was useful for understanding the BPO sectors and their challenges by revealing the dynamics of value networks in Kenya's and Rwanda's BPO sectors that are interconnected to distinct value chains of other subsectors.

This chapter defines and delineates the BPO sector and two other sectors, ICT innovators and ICT connectivity enhancers, as sectors that we found to be interconnected in value networks. Based on their commonalities and distinctive factors towards other ICT companies, we denote the three sectors together as connectivity-based enterprises. This chapter is thus simultaneously a description of our research findings and a categorization that is essential to understand the actual value chain analysis that we conducted. We describe each sector and the umbrella category in this chapter, before the following chapter presents in-depth analysis of value chains and networks in the sector.

Business process outsourcing

We define *BPO* as work that was previously carried out within a firm but that is now carried out by an outside entity. We focused specifically on digitally enabled, ICT-based BPO as this kind of work can potentially be outsourced across greater distances and is ostensibly influenced most by the presence or absence of ICT and internet infrastructure.

We also found it important to distinguish between different geographical configurations of BPO work flows. Aside from international inflows of work (Rwandan/Kenyan BPO companies conducting work for foreign clients), we also found outflows of work (foreign BPO companies conducting work for Rwandan/Kenyan clients). We also found domestic BPO work flows (Kenyan/Rwandan BPO companies serving Kenyan/Rwandan clients). International inflows can further be divided into inflows from the region (that is, East Africa), from within Africa, and from outside of Africa. A final important distinction concerns the origin and/or headquarters of a BPO company: an international business can have an office and operations in Rwanda or Kenya, but it remains an international company. These differentiations became essential to untangle more diverse flow patterns than the typically envisioned inflow of international work to Rwandan or Kenyan-based and -born firms.

ICT innovators

The second sector of ICT-based companies with a distinct value chain were *ICT innovators*. This category mainly includes start-ups, entrepreneurs and software developers producing new applications and software.¹⁴ ICT innovators accrue value from their technical abilities and by applying those abilities to sell novel ICT products that they develop from scratch or by adapting an existing ICT product to a new (local) market—still an ‘innovation’, even if not an ‘invention’. Accordingly, this value chain was the most contingent on the availability of highly skilled workers.

While it is imaginable that solutions developed by ICT innovators are sold to international clients, this was not the case in our sample: all products

developed by ICT innovators were designed for and marketed towards domestic or regional markets. Differentiation (and ultimately the possibility of extracting value locally) thus came primarily from combining two forms of expertise: technical capabilities and local domain knowledge about the contexts or communities at which the product was aimed.

ICT connectivity enhancers

The third sector was made up of *ICT connectivity enhancers*. It was more diverse and less clearly confined. Examples included electronic payment intermediaries, ICT training institutions and trainers, content and platform providers, hardware and software suppliers, web advertisers and agencies, software developer and web design freelancers not involved with innovations (as defined above), etc. What this group of actors has in common is that their value creation primarily consists of enhancing the value of internet connectivity for others. In other words, connectivity enhancers facilitate greater value extraction from internet usage for others. This means that ICT connectivity enhancers address clients that are already using the internet or ICTs but that have an additional unmet (connectivity) need and that aim to “get more out of” being connected.

This sector can thus be understood as a sort of secondary infrastructure that is necessary for internet connectivity to enable more advanced forms of value creation and extraction (where infrastructure is broadly defined). This sector is therefore complementary to digital content and applications themselves (consumption or usage is the end goal) and also to ICT and internet infrastructure in a narrow sense (cables, wires, towers, switches, etc.), which usually has very high upfront capital investments and is therefore mostly dominated by larger players. This category of connectivity enhancers was more prevalent in the Rwandan sample simply because we sampled more BPO companies and ICT innovators in Kenya.

Emergent value networks of connectivity-based enterprises

The typology of BPO companies, ICT innovators, and ICT connectivity enhancers emerged from our non-random, snowball sampling based on early interviews with respondents and our focus on understanding the internet's effect on the Kenyan and Rwandan BPO sectors. As a result, it should by no means be understood as a comprehensive or representative categorization of ICT-based companies. There might also be overlaps; for example, individuals might often transition between ICT innovators and ICT connectivity enhancers, depending on their opportunities and capacities at a given point in time.

Yet, we believe that this categorization is useful for addressing our research questions. We found these sectors when we expanded our sample beyond the companies at the core of the Kenyan and Rwandan BPO sectors. We did not pre-specify them but instead the categorization emerged from a snowball sample that was constructed iteratively while attempting to understand the dynamics that influence the BPO sector. This meant that, by virtue of our sampling approach that followed connections starting from (the few) BPO companies we found, we uncovered value networks within which the BPO sectors' value chains were embedded and upon which they relied.

Once we had finished our data collection, we found that each of these three sectors had in common that they consisted of companies that based their business model on (internet) connectivity; that is, they are *connectivity-based enterprises*. These businesses provided content and services through value

chains and business models that depended on ICT and internet infrastructure (hardware and software) put in place mostly by local and international ICT corporations or government entities, such as subsidized/government-owned and private mobile network operators, device manufacturers and software multinationals. They were thus categorically distinct from these larger providers of primary ICT and internet infrastructure, and they presented us with a complex picture of interdependencies and interconnections. The following two chapters will describe these interdependencies in more depth, and describe how we found that the BPO sector is best understood when looked at together with the other identified sectors.

6. IN-DEPTH VALUE CHAIN ANALYSES

This chapter presents the core empirical findings. It contains answers to the project's research questions about the influence that the arrival of the fibre-optic cables to the East African coast has had on Kenya's and Rwanda's BPO sectors. It draws extensively on our categorization of two additional sectors of connectivity-based enterprises—ICT innovators and connectivity enhancers—whose value chains interconnect with the BPO sectors' value chains, thereby forming value networks. This descriptive chapter outlines the three sectors of connectivity-based enterprises in turn, for both Rwanda and Kenya. This prepares the ground for the next chapter, which compares the three sectors and highlights their unique characteristics, their overlaps with other sectors of connectivity-based enterprises, and the interdependencies of Kenya's and Rwanda's BPO sectors.

Rwanda

Business process outsourcing

We found Rwanda's BPO sector to be at an incipient stage. The vision of BPO as a vibrant global industry that low-income countries can simply tap into through low-skill work labour cost advantages was not the picture that we found. Despite the government's discussion of BPO in the popular media [Majambere, 2010; Mugisha, 2010] and in policy documents [MINICOM, 2011; RDB, 2012], a very limited amount of international BPO work is currently flowing into the Rwandan economy.

We detail some important facets of the sector that explain this overall finding; namely the importance of social connectivity, the role of international firms and non-typical work flows, as well as open debates and trends in the sector.

Social connectivities and the focus on domestic and regional markets

Instead of predominantly serving clients from outside Africa, BPO appeared to be limited to domestic and regional markets. Call centres, for instance, focused either on the local telecommunications industry or on relatively simple local operations, such as taxi cab call-outs. Most international inflows of work came from places within the region, most notably from Burundi, Kenya and Uganda. Burundi was overwhelmingly the most common destination of choice, with several respondents pointing to Rwanda's higher level of socio-economic development. Kenya and Uganda were seen as more established markets.

This also applied to financial BPO. A handful of financial companies were included in the project sample and their operations were focused on the domestic market. Some handled work for foreign companies operating in Rwanda and occasionally in neighbouring countries. When BPO companies took on more regional work inflows, they were usually part of a regional network of companies, for instance, with headquarters in Nairobi. Many Rwandan-based financial companies and call centre and customer service businesses were also headed by Kenyan nationals.

Many Rwandan respondents who were able attract international inflows of BPO work had personal and family connections abroad that allowed them to compete for foreign clients. Accordingly, most managers expressed a desire to focus on expanding within Africa; South Sudan, Tanzania and the DRC were mentioned as potential markets in addition to the current target countries of Burundi, Kenya and Uganda. French speakers mentioned francophone Africa as another potential future target market. If they were planning on entering new markets, managers typically felt the need to find a local partner in that country.

Within the scope of this project, only four companies were discovered that were handling inflows of international BPO work from outside of Africa as part of their core businesses. These four companies focused on niche work and tended

to have a mix of international and Rwandan clients. In three of the cases, an intermediary helped broker the relationship between the Rwandan firm and the international client. In the fourth case, the company's director had prior professional relations with clients after working and living in a foreign country. Despite changing digitally mediated connectivities, socio-economic connections therefore remained necessary for companies to access international markets.

The first of the four cases is a Rwandan financial company that conducts audits and financial accounting for international clients in Europe. In the case of financial services, the Rwandan company usually came into contact with international clients within Rwanda; international companies would have a project in Rwanda and would hire the local BPO company to carry out the Rwandan accounting for the project, attracted by the cheaper cost of labour. Once the international companies started to recognize and trust the company's competence, they offered additional work from their international offices. The BPO company's manager is now considering making BPO a bigger part of his accountancy business. As an important lesson, in this case, it was through face-to-face interaction in Rwanda that the company was able to initiate a lasting business relationship. This resonates with the concept of temporary geographical proximity [Torre, 2008] as an important initial enabler for sustained (digitally mediated) exchanges over distance.

The second case is a Rwandan-born engineering and design company, doing 3-D modelling for international firms in the US and India. The company accessed these clients through intermediation via an equipment supplier. The BPO company also benefited from training and networking support from a US-based company with an interest in developing its partners' capabilities to use a software suite that it supplied. However, when the global recession of 2009 led to a drop-off of demand in international markets, the Rwandan company re-oriented itself towards the local and regional market.

The third and fourth cases conducted mobile application development for clients based in the US and Japan. For the third case, the Rwandan Development Board (RDB) together with the Japanese International Cooperation Agency (JICA) and the Japan External Trade Organization (JETRO) had established ties between the Rwandan software development company and the Japanese client, Rexvirt Communications/A.B.C. Partners. This case is discussed in detail below as the company agreed for us to share its story (see box).

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Case study: A Japanese client for a Rwandan Software Development Firm

After outsourcing an initial batch of work to the Rwandan software company, Japanese Rexvirt/ABC Partners is now attempting to broker further opportunities for Rwandan companies to engage with other Japanese clients [Rexvirt/A.B.C. Partners, 2013a,b]. The company considers Rwandan developers to have many 'harmonies' with the Japanese work ethic; such as 'kaizen' (good communication skills), diligence and shyness and 'earnestness and honesty'. At the same

time, the company feels that "Even if there is good harmony, project management is also very important. We must make a standard of it" [Rexvirt/A.B.C. Partners, 2013a] (see also figure 2). It is in the process of developing a model for such further engagement, taking part in trade shows and doing surveys to better understand the market. This is a very active form of intermediation.

2. Why Rwanda

Since Rwandan system developers are characteristically similar to Japanese developers, they are adaptive to the Japanese development style which requires flexible decisions in response to changes in conditions according to the progress in development. If a methodology that matches well with the Japanese development style further permeates in Rwanda, this country will become a more attractive country in offshore projects.

Characteristics of Rwandan system developers and their development style that is fit for Japanese projects

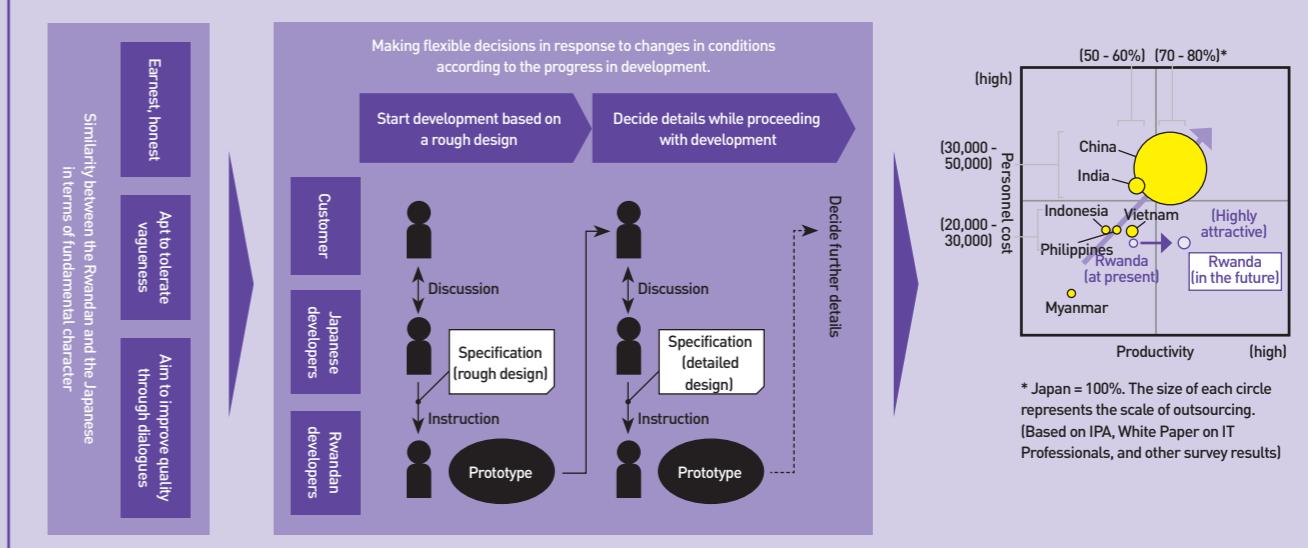


Figure 1: Rexvirt Communications and A.B.C. Partners promotional material¹⁵

Whole image of two models

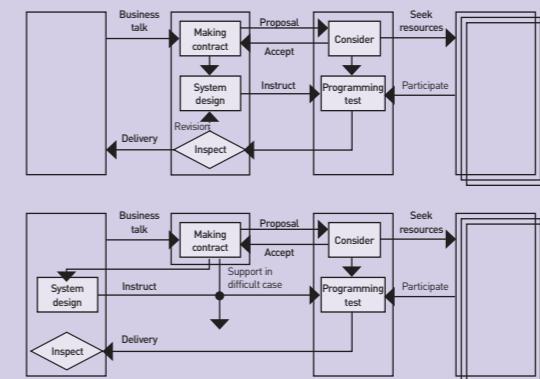


Figure 2: Source Rexvirt Communications and A.B.C. Partners, 2013a

Pros and Cons for customers

Japanese customers don't need to instruct Rwandan engineers by themselves (Rexvirt do it). The customers need to pay the labor cost of Rexvirt. * Currently all is this model, because customers hope that Rexvirt takes all the responsibility of quality control.

Japanese customers collaborate with Rwandan engineers directly. It is easy for the customers to enhance cost performance because they don't need to pay the labor cost of Rexvirt (only cost for matching and supporting).

Figure 3 represents the two forms of engagement that Rexvirt is developing for Japanese companies interested in employing Rwandan developers. In one, Rexvirt simply makes the initial introduction. In the other, it also takes responsibility over project management. When Rexvirt surveyed Japanese clients, they found that Japanese firms were most interested in the potentials for smartphone application development, embedded software development and software development for foreign markets, as well as customer data analysis.

To understand the enabling factors for brokering partnerships further, Rexvirt carried out an internet survey in January 2013, surveying 183 Japanese software, IT and manufacturing companies. They asked respondents whether they would be interested in trying Rwandan software development or BPO. While 20% of respondents were positive about the possibilities of employing Rwandan developers and BPO operators, 60% had concerns, particularly over security, the limited number of success cases, the limited advantages in labour cost (as compared to Asian countries) and difficulties of 'imagining' business with African countries over distance. Figure 4 presents the results.

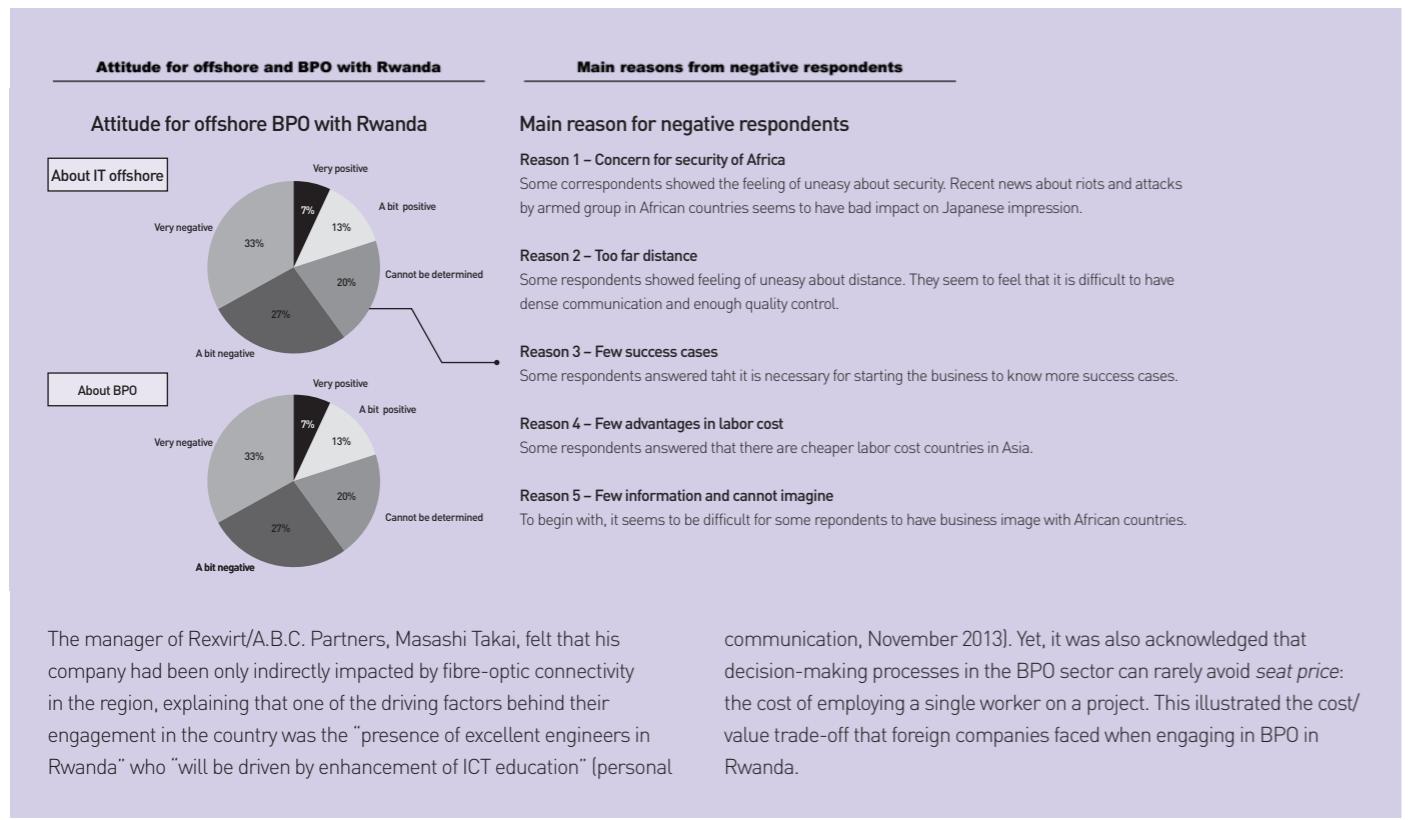


Figure 3: Source Rexvirt and ABC Partners, 2013a

International firms in Rwanda; outflows of work

Beyond Rwandan-born BPO firms, there was also a notable presence of international companies operating in Rwanda. The firms' local operations were usually embedded in more complicated global economic networks. For instance, Indian and other foreign businesses often acted as representatives for US hardware and software companies. We included them into the sample because they were seen as competition by Rwandan developers. In contrast to Rwandan firms, international companies ran private training sessions for their workers. Often, these training sessions were online, so fast internet connectivity was required. One Indian company, for instance, was actually getting involved in BPO within Rwanda, managing the printing services of many government departments.

Interestingly, international firms from within the African continent [Kenya and South Africa were mentioned as typical countries] were often able to settle in Rwanda with the help of large private sector firms [like telecom operators] or the government. The firms would win a large tender, enter the country and slowly build up its client base among smaller local clients. In other words, the first big contract functioned as the anchor, and once it was established, the international firm was in a position to compete for smaller contracts with local firms.

There were also a few instances of foreign companies operating with almost entirely Rwandan workforces. For example, Voxiva, a health SMS company based in the US and India, had a skilled Rwanda labour force, and at the time of our interviews, it was set to expand into other markets by sending Rwandans to establish foreign offices. The respondent from that company also indicated that Rwandan workers had made modifications to the company's software, and that those modifications were then used in other places. A similar situation existed with an international m-health organization, which employed primarily Rwandan employees in its Kigali office.

There was a second geographical configuration that called into question the simple story of BPO work flows as driven purely by labour cost advantages for tasks with low skill requirements. Namely, we found outflows of BPO work. Usually, this was niche work that could not be performed by a Rwandan

communication, November 2013]. Yet, it was also acknowledged that decision-making processes in the BPO sector can rarely avoid *seat price*: the cost of employing a single worker on a project. This illustrated the cost/value trade-off that foreign companies faced when engaging in BPO in Rwanda.

company, for instance, concerning technical facets of mobile and software development. Rwandan BPO clients typically outsourced work either to other East African countries (usually Kenya and Uganda) or to India, depending on the level of technical expertise required and the manager's own social networks. One interviewee commented that "outsourcing [within Rwanda] is affordable but it is hectic to get a lot of support". While he would have liked to have used local companies for easier communication and coordination, he felt that "capacity [in Rwanda] is still expensive".

Trends, debates and demands

It is useful to summarize a few trends and demands that were voiced by our interview and workshop participants. For instance, most business owners now aim to focus on local markets in order to first build up their capacity, demonstrate success stories and develop systems and procedures that would allow them to expand in the future. Most expressed the desire to work with partnerships, both with foreign companies within Rwanda and with other African firms in new markets. Especially when it came to mobile app development, there was a sense that one had to know and understand the local market before acting independently. Such moderate and reflexive statements stand in contrast to the hype and expectations that [media and politicians in] the region had built up around the arrival of the submarine fibre-optic cables.

Accordingly, government officials emphasized that, while improving public services is their main motivation, the government also recognizes how these projects make the country an attractive testing ground for international companies wanting to develop and pilot solutions for the rest of Africa and other low-income countries. Many policymakers stressed the idea that, with this experience, Rwandan workers and consultants might be well-positioned to sell their services in neighbouring countries later on.

BPO company representatives also felt that they would benefit if Rwandan and regional clients were better educated about the potentials of BPO in particular, but also ICT in general. For example, BPO practitioners pointed out that government agencies beyond those directly dealing with ICT-related programs are not aware of the local BPO sector and its potential to aid ongoing document

and process digitisation projects. Some also felt that the ICT and internet infrastructure needed to be further expanded into rural areas. They stated that building up demand within Rwanda would allow developers and managers to "hone their skills" before going into other markets. However, many participants felt that there was currently a bias against Rwanda-based developers even among Rwandan managers, especially within government, where anti-corruption legislation required extensive systems and assurances [often using costly or complicated international benchmarks or certificates].

Opinions diverged whether such a tendering process allowed foreign companies to capture contracts, or whether Rwandan developers simply are not up to the challenge. In some of our interviews, this issue led into a broader debate around potential tradeoffs between product quality and offering opportunities to local software and application developers, for instance, in the humanitarian sector.

Another debate concerned the nature of partnerships between foreign and local firms. Participants pointed out that foreign companies currently often either collaborate with local companies merely to obtain a local affiliation or when they need the local company to maintain their existing and imported systems. At the same time, almost all respondents felt that the presence of foreign firms within the country was a good thing. Many more successful managers said that their success was a matter of exposure, both to training but also to international connections and mentors.

ICT innovators

The value chains and geographical configurations of ICT innovators had several links and similarities to the previously outlined dynamics of the BPO sector. Most importantly, we found connections regarding the importance of skilled workers [in particular in software development], the prevalence of a local and regional market focus based on adaptations of existing business models, as well as the relevance of a country's reputation and international and local actors' conceptions of connectivity.

Skills

Many people in the ICT innovator sector spoke about the ways that changing connectivity has provided opportunities for learning technical skills and competencies. One interviewee described how Google was the "best academy". Another explained how it was not just knowledge that internet connectivity offered, but a whole work environment, in particular, through the availability of open source or free software and software development kits:

[T]here's a lot of open source software that's out there, so for me to be able to build software or an application, I need a development environment on my computer so I can download [the needed software] [...] Even for our clients to be able to deploy the software that we built for them, we're using a lot of open source software [...] Without open source software, ICT startups would not exist in places like this.

We could observe that faster internet speeds and lower prices for bandwidth have had a substantial impact on learning and development among a select group of highly motivated individuals, but this was usually in tandem with personal support and direction, beyond the educational system. Many respondents talked about how university education only imparted theoretical knowledge. They felt that real knowledge and skill could only be developed once they were forced to use that knowledge for practical purposes. However, access to such pressure [in the form of internships and work opportunities] were few and far between. In other words, while changing internet connectivity is providing access to new knowledge and tools, it is important to stress that many success stories of innovators have benefited from just a few prestigious and extensive innovation competitions and training programs.

There was also a distinct pattern that the most motivated individuals had usually received support from non-Rwandan entities. For example, MIT hosted a summer program for Rwandan mobile app developers. This program appears to have had a profound impact on the personal development of those

involved. Many of the celebrated success stories came from this program. For example, some ICT innovators had been involved in MIT's 2011 summer program in KIST (AIT/MIT, 2011) while others had worked in large companies with international workforces. One interviewee stressed the international exposure that he received from working in a large telecom company separated him from others his age. He said:

I had the opportunity of being approached and exposed to those senior... engineers, [who] could challenge me all time. Say for example I have... a call, a conference call... said what the hell is that? Conference call, what is that? How am I going to do this? And then I was still very young compared to my other workmates. And I was just exposed to it, that whole thing and then I started to adapt myself. And the guys just kept telling me, [interviewee's name] you're doing good....

[The Wall Street Journal] came here and they made an interview and later on I find myself in the newspaper. It was kind of crazy, I remember that time... I was 25 at that time. Yeah and then I was just saying ooh, what's this? And then... people could just come here and say, hey, [interviewee's name] you know, I read about you.

It is not straightforward to derive a clear policy recommendation from this finding. Several of our interviewees stressed that this social and domain nature of knowledge and expertise in the software sector, particularly within the open source community, means that skills are notoriously hard to certify and teach in a traditional education model. A good developer is often judged by his or her last project, so in order to know if someone is good, one must have social knowledge and subject matter experience about the relevant actors. This is the kind of knowledge that builds over time through exposure and social linkages, rather than emerging through one-off lessons.

Innovation and local adaptation

Interestingly, ICT innovators embraced the value of local and regional adaptations of their products much more outrightly than interviewees in the BPO sector. When we asked young developers whether they were threatened by foreign software suppliers, most said 'no' and instead welcomed the competition. Rather than viewing international competition as a threat, many spoke about the inevitability of changing business models and how entrepreneurs and businesses had to constantly adapt and draw on more than one value chain to sustain their businesses.

Many managers in both countries appeared especially flexible to changing business models, changing technologies and changing technological affordances. For instance, one company both developed data management software and found ways to supply cheap laptops to schools. Many developers were developing mobile applications for the mass market while also working as IT consultants to third-party companies. Another interviewee commented:

I've been in this industry for 15 years now. Over a five-year period, if you do not renew your knowledge, if you do not adapt, you will be out of sync. You always need to think about what's next. How is the industry evolving? What are you going to do? What is the next step? And I think it's very healthy for any business and it's a must in the IT industry otherwise it can be guarantee that you will be dead within three to five years.

They also felt that local software developers and innovators were actually needed to educate Rwandan client businesses about the need to use software and because they understand the local context better. One CEO commented that when you are building apps for other markets, "you have to know what's trendy" and also understand that market's "data usage". Or in the words of another CEO of a Rwandan startup:

It's very important to understand the local market, the culture, because we've had trouble with people coming in and trying to provide advice and they just don't get the culture. You can't do things like that simply because of the cultural differences.

In other words, while changing connectivities do appear to be facilitating a reduction of some regional differences in technical expertise, it does not appear to change the fact that developers need to understand their local markets in order to design appropriate applications and value chain models. One Rwandan developer noted: "It requires a lot of investment to come and establish something in the country. But for me, if I hold my laptop and an internet connection. I can build it while they are spending a lot of money."

In fact, many developers saw themselves as benefitting from the best of two worlds by being able to translate ideas and solutions proven elsewhere into local contexts. In many cases, developers have worked with single organisations like banks, government bodies or large companies to pilot a solution. These organisations provide much of the domain knowledge about how existing systems work and what challenges they are likely to face, and they also generate fairly predictable revenue for the ICT innovators. For example, there were two international e-health companies operating in Rwanda that took an existing system developed in a foreign context and applied it to a local context. In both cases, the companies employ nearly all Rwandan staff in their Rwandan offices and gave them in-depth training in how to use the system. In another case, a Rwandan developer was even able to export a large ICT system that he had built for a Rwandan large retail distributor. When he later travelled to Burundi and discovered a similar organisation in operation there, he was able to sell his solution to the new company, without making too many modifications.

However, the focus on local markets first also implies that ICT innovators grapple with local problems and market constraints. In particular, many participants expressed that ICT innovators are fundamentally constrained by the limited adoption of internet and mobile money by the wider population: making it difficult to monetise users' ICT consumption.

Motors for broader reputation and conceptual connectivity?

Another key intersection between BPO and ICT innovator value chains was the importance of projecting hope and optimism about the ICT sector overall. In this context, we found kLab, the government-created technology innovation hub in Kigali, to act as a highly visible showroom and convening point. Numerous journalists, foreign businesspeople and international organizations pass through the kLab: usually with the broad goal to get a sense of the ICT field in Rwanda. At the same time, 'hanging out' in the impressive, polished kLab space can easily give the impression that the Rwandan ICT sector is more developed than it is.

The offline space (in combination with a polished web and social media presence) partly serves to generate co-learning and collaboration within Rwanda, but also focuses international attention and allows decision-makers to affect the image of the country's ICT landscape abroad (irrespective of kLab's immediate and actual effects on skill development). We would therefore argue that the organization serves a strategic role in attracting international attention and interest to Rwanda.

Policymakers and private sector associations have also emphasised developing a small number of well-qualified individuals who can demonstrate success and thereby attract international players to come to the country. CMU's educational program is a case in point; it is designed for a very small number of top-notch developers and entrepreneurs. Similarly, kLab can host only a limited number of developers and therefore needs to choose carefully amongst applicants. Meanwhile, respondents overwhelmingly felt that existing national universities are behind when it comes to ICT training.

Finally, we can conclude, albeit tentatively, that the Rwandan government appears to understand many decision-making processes practiced by international companies. Rwanda has consistently scored well in rankings such as the World Bank's 'Doing Business' and the ITU's internet speed ratings. Their ability to provide security and a good image to visiting businesspeople has clearly impressed international companies.

These observations resonate well with the idea of conceptual connectivity and its importance as a lever for local governments and media (Graham & Mann, 2013). At the end of the day, international (and certain local) actors' perceptions of ICTs and ICT innovations in Rwanda will shape their decisions—their mental concept of ICT and business in Rwanda becomes closer and more connected—and so the image that is projected ultimately can have real and material impacts.

ICT connectivity enhancers

Businesses in the sector of ICT connectivity enhancers in Rwanda also had value chains that were interconnected with those of the BPO sector. As ICT connectivity enhancement is ultimately about equipping users to extract more value from internet connectivity, this sector mostly had more indirect and long-term ties with the BPO and ICT innovator sectors, adding to the broader ICT environment and actors' (and workers') technology saviness as well as their social connections with international actors.

In Rwanda, key examples of improvised, informal connectivity enhancer businesses were companies that exploited the limited penetration of international electronic payments, credit cards and postal addresses, as well as the limited technical expertise of the general population (for instance, some credit card-holding entrepreneurs acted as payment intermediaries between foreign equipment sellers and local clients). Training programmes were another important part of connectivity enhancers; for instance, within the context of educational institutions like KIST and the OLPC initiative (OLPC, 2013), or ICT entrepreneurship programmes like DOT Rwanda and kLab.

Exploiting niches through built-up social connectivities

Many cases of companies in the connectivity enhancer category appear to be embedded in non-ICT-related import-oriented value chains (intermediation between global suppliers and local customers certainly plays an important role in this sector). Yet, many businesses in this category would not consider themselves to be intermediaries at the core. The term 'enhancers' implies something more: some added value. In many cases, Rwandan enablers also act as cultural enablers and enhancers of technology. For example, payment intermediaries are not merely acting as credit-card holders or the holders of superior knowledge or relationships, but also as individuals who understand two different cultures and act as brokers of understanding.

Accordingly, as in other sectors, we found that access to faster internet did not necessarily allow businesses in the sector to establish new business relationships outside of Rwanda, but it allowed them to maintain and strengthen existing ones. Most businesses that had relationships with foreign companies had made these connections offline first, through mutual contacts and friends or conferences. Some respondents had also studied or worked abroad.

Another example of cultural brokerage is evident in website design. Rwandan website designers and developers have two distinct advantages in the Rwanda market: social knowledge and cultural knowledge. They had social networks that made them visible and trusted to Rwandan clients. They also understood the local culture and were better able to anticipate cultural sensibilities. Rwandan designers and developers therefore operated in two socio-cultural environments simultaneously, one global and one local; a finding similar to the one that Takhteyev (2012) observed in the Brazilian software industry.

Workers in informal connectivity enhancers tended to be relatively mobile, and often made physical trips to markets in the Persian Gulf, Asia or other African countries. They established relationships with entrepreneurs in these locations while also building their own professional networks. In place of formal partnerships, informal connectivity enhancers relied on socialised trust, through visiting and maintaining contact with their suppliers. Better internet connectivity allowed them to maintain closer communication with partners and to acquire current information about markets and prices.

Given lower formality and scale, these companies did not benefit from the economies of scale and network effects typical for digital products. Instead, they explicitly focused on niches that large ICT companies could not address. For example, one interviewee had built up competency and experience in interacting with the specificities of the Eastern DRC market. Another identified key groups of customers, including teachers/students, nurses/doctors and salaried employees, understanding their own specific needs in order to customize offerings. Operators in these informal value chains had to be highly flexible, changing products frequently. They did not typically do well in large tenders because they did not have formal guarantees or large capital inflows.

Generally, as with the case of BPO, many managers engaged with businesses that functioned as enablers of ICT usage spoke about how they did not fear international competition, because they felt that international investors would bring skills and standards, but would still require Rwandans to understand the Rwandan market. One Rwandan advertising manager, for instance noted:

if someone comes ...with the knowledge, because anyway to succeed in Rwanda, you have to know Rwandese... but we have to get that knowledge. So that knowledge, if you add it you add up with ... the high standards, international companies may really lift the market.

Transitions and pathways

While we cannot highlight systematic evidence, there are several relevant instances of transitions between economic activities. For example, website design was sometimes a useful gateway activity for software developers before they could start their own business or find formal and long-term employment. Also some of the aforementioned credit intermediaries transitioned into a broader set of economic activities, as they developed business contacts and acquired greater familiarity with goods and markets.

Some of the most revealing pathways we found were cases in which smaller entrepreneurs among ICT connectivity enhancers had begun to transition into more formalised relationships by establishing a close working relationship with a particular niche foreign supplier. Again, over time, social connections and trust allowed actors to enhance their economic transactions and get more out of internet connectivity. In such cases, they had the backing of their foreign partners and were typically listed as a partner on their websites, which meant that prospective additional clients could easily find them. These more specialized companies oriented themselves more towards the private sector and to NGOs than to government, as they faced lower entry costs and less stringent tendering requirements. One interviewee explained his re-orientation from government tenders towards servicing NGOs. We quote a large section of the interview in full:

I have shifted...I'm no longer into IT equipment supplying and... in IT equipment maintenance, no more because of ... how the market is today.

And what has changed?

The change has been that ... with IT equipment supplies... now there's a lot of fake computers.

Fake?

Yes. Which are not genuine coming ... from Kenya, India and China... if I supply those computers, I will get in trouble with customers, just for the guarantee. Another thing is that to be able to buy all those equipment...to be supplied, it asks for a lot of capital which I don't have.

Why do you need a lot of capital?

Yes, to buy...Because the payment comes later... we don't sell to the private sector. Here the private sector is still small... I was selling equipment ... to the government and the government is tender processed, and then you earn a contract, and then they will pay after the supply. After the confirmation, because they could receive notes and...all specifications are inspected.

It takes a long time.

That can take a lot of time. And ... to get a loan from the bank you need to have ... collateral...which I don't have. So that's why I said, "Okay, instead of getting stressed with this kind of businesses. Better ...I stop this and I focus on something which is promising."

So what does that mean?

So ... now I'm selling computers. If I have to supply equipment, I supply power efficient computers. Manufactured by [a solar computer company]. I partner with them and we are working many times with them. I don't supply this equipment... to the government. I supply this equipment to NGOs. And the NGO to me, to sign a contract with them, I make sure they pay 50 percent as an advance.

Kenya

Business process outsourcing

Kenyan companies have historically found it difficult to get direct access to clients and international work. Faster internet connections were seen as a way to make this easier, 'cutting out the middleman' and enabling Kenya's access to international clients and levelling the playing field between Kenyans and competitors in Asia. Our research shows that this has not happened. Almost all interviewees ultimately expressed how geography and distance continues to be important factors and how the fibre-optic cables have not removed intermediaries in the sector.

The Kenyan fieldwork in the BPO sector revealed a greater level of activity and a longer history of practice than the Rwandan case. The concepts of value chains and intermediation also seemed to be more prevalent in our participants' own understandings of the sector. As a result, in contrast to the preceding section on Rwanda, we will take a more historical and chronological perspective in this section on Kenya, presenting illustrations of value chains from the perspective of participants. Within the BPO sector we focused specifically on data services, excepting call centre work.

Understanding Kenya's BPO history

Informal beginnings and a promising period of professionalisation

In the early 2000s, Kenyan companies began experimenting with informal BPO work. Internet cafés were transformed into BPO operations afterhours, taking on small amounts of work from online outsourcing platforms like guru.com, elance, o-desk, and u-test.¹⁶ Stories about such companies fuelled optimism about the potential for BPO in Kenya. Because Kenyan companies had easily gained access to this kind of informal work without any intervention from government or private sector associations, many within the country assumed that the country's potential could be scaled up with the right types of capacity building and training.

Established businesspeople started to invest in the sector. In 2005, Kencall opened, followed by several other more formal BPO businesses: Technobrain, Horizon, Adept and Direct Channel-Simba Technologies, among others. These companies had workforces ranging from 100 to 500 workers and initially focused on getting big contracts from international clients (primarily US and European firms). Of the companies listed above, almost all reported

close to 100% international clients before 2009. As the sector began to grow, a Kenyan BPO and Contact Centre Society was formed in 2007 and membership soon grew to more than thirty. An interviewee who had also worked as an advisor to Indian and Chinese BPO destinations, summarised Kenya's advantage as follows:

The good thing about call centre [work] is the [Kenyan] accents are very, very good and neutral. Number two is there are some amount of saturation levels reaching India and Philippines, and number three is attrition levels in these countries and companies operating in these companies are crazy high. I think the attrition levels [has reached] about 100 percent ... in India and Philippines. So I think the customers are ... saying 'I need... a new source'

Many managers and policymakers thus positioned the country as a BPO customer service hub. In 2008, Kencall won the award 'Best Non-European Call Centre' at the Call Centre Focus Conference, the biggest trade show in the industry. This effectively began to put Kenya on the outsourcing map.

Thwarted prospects in the wake of the arrival of fibre-optic cables

Unfortunately, this optimism proved short-lived. By the end of 2008, many BPO companies were experiencing difficulties. Companies like Global Connection and Continental had closed, and even the largest firms were struggling (Kundai, 2008). Internet prices had not dropped as much as hoped, and firms found themselves struggling to work cost-effectively.

The global recession did its part and made international firms less likely to engage with unknown African firms (Omondi, 2012). Exacerbating this perception of financial risk was a significant public relations risk attached to BPO. US President Barack Obama identified the offshoring of jobs as a key issue in his 2008 and 2012 election campaigns. In 2008, he repeatedly declared the US needed to "stop giving tax breaks to companies that ship jobs overseas" (Thibodeau, 2012). In 2012, he sarcastically labelled his challenger, Mitt Romney, a "pioneer in outsourcing" (Dwyer, 2012). While the true impact of the recession on outsourcing is mixed (on the one hand, recession encourages firms to cut costs, but on the other hand, it pressures politicians to erect protectionist policies),¹⁷ many Kenyan managers cited Obama's speeches as having seriously affected their business.

One reason that this situation might have particularly hurt Kenya (as compared to other destinations like India and the Philippines) was the fact that Kenya would have needed vocal support from the first international clients in order to establish itself (during the BPO sector's critical growth phase). By making it difficult for clients to openly endorse a new destination, the global recession may have dried up opportunities for new outsourcing destinations while maintaining a steady (but less visible) flow to already established countries. In other words, the global political and economic contexts at the time of the arrival of fibre-optic cables in 2009 did not afford much visibility to Kenyan firms.

Reorientation towards impact and domestic outsourcing

As a result, after 2009, many Kenyan BPO firms went out of business, and others actually managed outflows of BPO work, as in the Rwandan case. One BPO consultant commented:

I think some companies here who are outsourcing their work to India for example. So they don't even have to make big noise about it because it's not socially accepted...it's not a nice way...of doing business because they feel the jobs are going out. But you can ask those companies they're probably growing faster because of that.¹⁸

Yet others have turned to 'impact-sourcing',¹⁹ attempting to position Kenya as a host to corporate social responsibility schemes. The impact sourcing company Digital Divide Data opened an office in Kenya, and Samasource began to find partners to whom it could pass work from its US offices. Even amongst some of the more established interviewees, many had come to depend on Samasource

for overseas work. The Rockefeller Foundation and Enablis (a foundation that promotes entrepreneurship in low-income countries) also partnered to open a rural impact sourcing BPO project in the city of Kisumu. However, interviewees reported that the margins tend to be lower than they are from other pathways when work comes through such an intermediary.

The Kenyan government's approach began to shift noticeably. The Kenya ICT Board started to allocate funds to Konza City instead directly to BPO promotion, and the government adjusted its communication efforts to distance itself from a focus on the BPO sector, for instance often using terms such as 'ITES' (IT enabled services) and 'software development' instead of 'BPO'.

Yet, the most striking development concerning BPO in Kenya was a clear shift towards the local market. Most of the interviewed firms that had mainly attracted international inflows of work in 2008 were now dependent on domestic workflows. Some smaller companies had a higher share of international inflows of work, but this was more piecemeal and usually focused on lower-value impact sourcing. In only a few years, some firms had gone from having close to 100% of their clients being non-local to international clients now making up only 20-40% of their business.

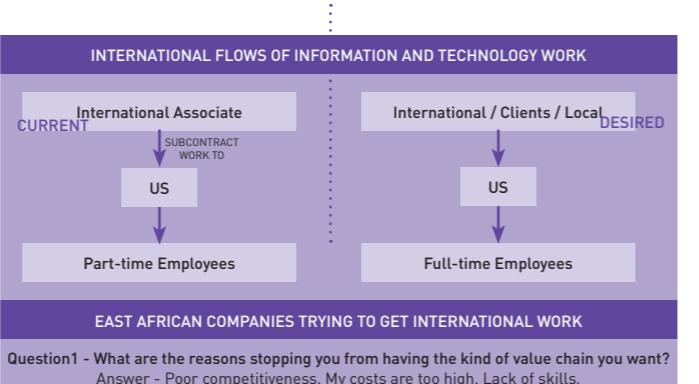
Overall, we found the Kenyan BPO companies that have survived to be rather mature, business savvy and battle-hardened. Nevertheless, signs of exhaustion and a new inward-focus were dominant. These companies employ anywhere from 20 to 300 workers. There have been reports of late payments to workers, and the financial sustainability of many of the businesses is still not ensured. Many of them say that it is a learning process and that they are now ready for the global market.

Major challenges

Given that Kenya is an important case where high-flying expectations towards the BPO sector did not match the complex realities of remaining barriers for businesses, the remainder of this section focuses on an outline of challenges that the sector has had to grapple with. Particular emphasis is placed on problems of intermediation, as this was an important concern for many of our participants.

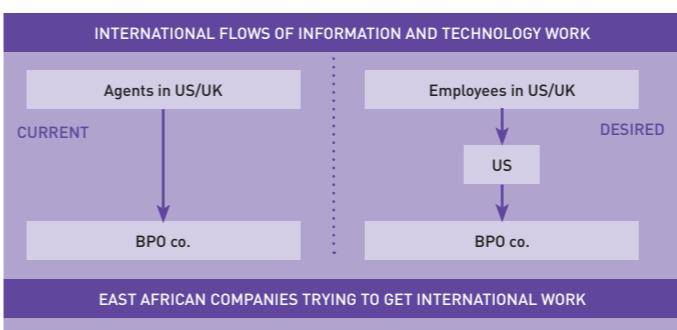
Direct access to clients

First, Kenyan companies underestimated how difficult it would be to access international work opportunities. While physical internet connections are often presented as the key that allows countries to engage in international service work, interviewees stressed the difficulty in actually communicating directly with clients. This was starkly demonstrated in the following diagram made by a participant in a focus group (in response to a prompt to draw current and ideal flows of work):



The BPO manager who made the diagram distinguished between an 'international associate' (presumably a consultant or intermediary) and an 'international client' (an organisation in need of the provided BPO service). Without direct contact with international clients, the manager felt unable to provide full-time stable employment to his workers. This ultimately created a degree of perceived disconnection on the part of the manager.

Some focus group participants expressed a desire to have international employees or offices abroad in order to attract more work for their firm. For instance, one participant explicitly highlighted the importance of 'presence' in other markets, stressing 'access to the end client' as a key variable in determining the success of a business model. These participants also wanted the government to facilitate presence in foreign markets. The two drawings below again emphasize the importance of having 'presence':



The importance of physical proximity to customers in acquiring expertise and access to global networks of work was stressed by many interviewees. This is one of the primary reasons that impact-sourcing intermediaries like Samasource and Digital Divide Data have been so successful in sourcing work: they have offices in the United States and use these connections as the foundation of their business models.

Kenyan companies also found it difficult to pull away business from India and other places. In many cases, Indian companies are instead passing on low-value work to Kenyan contacts. Most Kenyan companies do not have enough capacity to attract a big client, while being unable to attract enough work to add enough seats to build this capacity in the first place.

Some managers spoke of how Indian firms get around this problem by sharing work between delivery centres when they want to bid for a big contract. This strategy was also pursued by the organization Enablis in promoting rural BPO—their Indian advisors advised them to go for one big client, rather than a number of smaller ones. However, most existing Kenyan companies did not seem to have good enough relationships with their competitors to be able to coordinate in such a manner. The collapse of the former Kenyan BPO society has left the sector without a strong industry voice. A new society has been formed but it has had trouble establishing itself and gaining momentum.

In sum, it remains relatively rare for direct linkages to exist between international customers (i.e. firms in need of a service) and Kenyan BPO providers. Chains of intermediaries and consultants are typical, where big contracts are split and divided into smaller contracts distributed to multiple companies.

Understanding BPO work

Kenyan companies and policy-makers also underestimated the difficulties of understanding which business processes BPO work at a distance would rely

on, and they struggled to make sense of how the sector functions (Mann & Graham, 2013). Larger and more professional firms like Kencall and Horizon drew on Indian, Filipino and American consultants to help structure operations and train workforces. Impact BPOs were likewise supported by international backers. As an example, Caroline Wanjiku, the CEO of the impact-sourcing company Daproim travelled to the Cambodian headquarters of Digital Divide Data while workers from Impact Sourcing Africa travelled to India to receive training from their Indian partner Ruralshores (Sheth, 2013). Smaller businesses that did not have this international support found their operations to be unprofitable. In particular, managers from smaller companies struggled to make sense of the variable costs and values of different forms of work and thereby judge their own capacities to meet deadlines and make profits.

Because smaller Kenyan companies lacked adequate knowledge about the sector, many made errors of judgement. An interviewee who was considering bankruptcy explained how he and his colleagues had initially invested in a small operation of 15-20 people, hoping to get higher-value engineering work. However, they instead decided to partner with an Indian company that encouraged them to take on customer service work. As the relationship went on, the managers discovered that they could not make profits within the terms of the contract. The manager described his dilemma as such:

[W]e approached a few people from Horizon and Techno Brain and they told us that [they] have 100 people at daytime and 100 people at night. Here we are trying eight people in daytime and four at night...We don't have the scale...the lady who set this up, she went to India...and she saw thousands. It was like warehouses full of thousands...I thought: how are you going to compete? If you've got 20 seats and someone's got 2,000 seats, no matter what it is you're doing, he's going to do it much cheaper than you per seat...We knew how much it would cost, how much would the VoIP cost in America, were we going to go through America or going to go through India. We did that sort of research. And we knew what we needed to do to make it work. We couldn't reach the threshold.

Other Kenyan BPO operators faced similar problems of scale. In order to compete and get the kinds of clients they needed, they required larger workforces. But in order to acquire these larger workforces, they needed more consistent and profitable streams of work. They found themselves in a vicious cycle, compounded by their inexperienced management teams and the tendency for young BPO workers to move on to other jobs during slow periods. In turn, prospective clients looked at scalability and long-term capability when making the decision to come to Kenya.

Comprehending value was not an easily disintermediated process for either Kenyan managers or potential clients. Difficulties in calculating the intangible value and the immaterial labour of BPO work made negotiating new contracts challenging and forced Kenyan actors to rely on existing BPO networks (Steinmueller, 2002; Marazzi and Mecchia, 2007; Spence and Carter, 2011). These networks were characterised both by altruistic wishes of foreign partners to help Kenyan partners and by more straightforward profit calculations. While some Kenyan managers believed that Indian and other foreign associates passed on work that Kenyan workers were better positioned to complete (due to their clearer English accents), others suspected collaborators were only passing on low-value contracts, while retaining higher-value contracts.

Accordingly, many companies struggled to distinguish between profitable work and exploitative work. For example, one interviewee who had worked in three different Kenyan BPO companies complained:

Some companies started a bit early, that were very influential and they had some very, very big clients. Now those clients left for various reasons, and when you have such kinds of huge clients leaving the country, to be quite honest, since 2008 when one of the biggest clients left Kenya, we have never seen anything bigger until today.

This problem was ostensibly magnified by a World Bank subsidy, which encouraged inexperienced firms to enter the market. In 2009, responding to criticisms about the World Bank subsidy, the new CEO of the ICT Board, Paul Kukubo, explained in an interview with Kenya's *Ratio Magazine*:

A lot of the people who came in to ask for the bandwidth subsidy were new businesses... Their problem wasn't bandwidth costs, but a basic lack of capacity and understanding of the industry itself. Many small and inexperienced firms have cropped up in response to government incentives, which established BPO companies say is dragging down the industry's reputation (Ratio Magazine, 2009)

Viewed through a national lens, the closure of several firms made the whole sector seem immature and risky. The good faith that had been extended in 2008, when the Kenyan marketing campaign was in full swing, had faded by 2012 and 2013, and larger Kenyan BPOs found themselves on the back foot. They had to find a way to restore the faith of international clients, who needed assurances that Kenyan companies were capable of taking on international contracts.

Moving beyond domestic BPO? How?

Domestic outsourcing became a way for Kenyan managers to make sense of the industry and to prove their value to clients within a local setting. It would also allow them to experiment with higher value BPO through automation and digitisation projects in Kenya and the wider East African context. This re-orientation was supported by key government officials in the ICT Board and the Ministry of Information who saw local outsourcing as a way of increasing efficiency and making the economy more competitive. In September 2013, *Ratio Magazine* quoted the Kenyan Permanent Secretary of Information and Communication, Bitange Ndumo, explaining the government's shift:

Mid-stream we changed policy and indeed communicated that we had shifted from marketing Kenya abroad to local outsourcing. [...] It was pointless to continue marketing Kenya abroad when we had sufficient work locally. [...] Once we became proficient and realized internal efficiencies, then we could now move to the outside world. We still have the opportunity to use this strategy (Ratio Magazine, 2013).

Domestic outsourcing would allow Kenyan managers to retain their workers, build up competencies and expand their portfolio of clients. It was not just a matter of turning to domestic clients in the absence of international clients, but rather it was also an attempt to use the domestic market as a way of building global recognition in the long run. For this reason, almost all our interviewees claimed that they wanted Indian and other foreign BPO operators to enter the country. The manager of a large, well-established Kenyan BPO asserted:

The government could help these companies to get business through a secondary effect such as promoting Indians and others to come to Kenya, therefore it looks like Kenya's attractive, therefore people who don't want those guys may now pick the Kenyans and the Kenyans get more business.

Another interviewee reinforced this belief, asserting that Indian companies would bring work to Kenya from existing clients:

The good thing about Spancos and Tech Mahindras [Indian BPO companies] of the world is they have the financial muscle, but more than that they have the global leverage. So they have... various customers from India, from China... when they... say "now we have a centre in Kenya as well"... a big, large company, ... fortune 100, fortune 500, might come and say, "Fine I'd like to try it out in Kenya."

Managers saw the entrance of foreign companies normalizing Kenya's reputation. Indian and other foreign BPO companies would bring prominent clients and provide Kenyan workers and managers with experience and understanding of the systems and processes required. Most importantly, foreign BPO operators would show foreign investors that Kenya was a

stable, reliable destination. This desire was manifested in our interviews with representatives from the Kenya ICT Board, who revealed that a newer government strategy was to now focus efforts on attracting large international financial and BPO companies into the country in order to again jump-start the sector.

ICT innovators

As in Rwanda, value chains in the Kenyan BPO sector were closely related to the value chains in the country's ICT innovation sector. Given both sectors' longer history in Kenya, these interconnections are also marked by a greater degree of complexity. The most important interconnections were found in the movement of skilled labour between sectors, as well as in the realm of the country's overall reputation as a destination for ICTs. In the Kenyan context, there is the additional element of a shift in emphasis by the government and media from a specific focus on BPO until about 2010 to the ICT innovation landscape thereafter. The iHub represents a particularly notable piece of the puzzle, in that it played a large role in crafting an image of Kenya as the 'Silicon Savannah', emphasizing grassroots, private sector-driven ICT entrepreneurship.

The role of M-Pesa

The success of M-Pesa and the growth of a smart phone-owning middle class have undoubtedly attracted foreign developers and ICT companies to Kenya. Much of this attraction is based around a brand that the country has created for itself as a 'Silicon Savannah'. One US-American developer working in Kenya described how he had decided to move to Kenya:

We came following M-Pesa. We came because the market was ready here. The market indicators were good... the growing middle class is relatively stable, [and there are low] political and currency risks.

M-Pesa came up in many other interviews with Kenyan developers describing how it had opened up doors of opportunity. One interviewee described how a South African company had contacted his company for a particularly interesting project. He did not immediately understand why they had contacted him. He explained:

[W]hat they planned to do was really big and ambitious and fun and interesting, we really wanted in but we couldn't quite figure out why we were in it, and then it turned out that the people [at] the heart of this project, kind of had this perception that Kenyans understand mobile payments like at a genetic level, it's like we can run and we know how to make mobile payments working and that's why M-Pesa's uptake has had and all these things. So there was a sense people think we had a secret sauce of some kind, and we didn't have secret sauce but we did have a certain amount of examples we could extrapolate from.

Another developer that had done numerous coding projects for foreign development companies in the US and UK (as well as launching its own applications) described M-Pesa as a black swan that "can't be repeated; it's just there". But while he felt there was a little too much hype, he maintained that the perception that "Kenya is very way ahead" is "good because it gives you a job at the end of the day". He also asserted that Kenya was cost-competitive and had pools of talent and experience with regards to SMS-based applications, relative to other regions.

Combining market knowledge with technical skills to address local markets
As in Rwanda, the most successful companies are those that had upgraded an existing ICT system for a large incumbent firm or government agencies. This model of software and IT system development tended to offer a secure revenue stream and had low risks, but again larger and more established companies had advantages in gaining access and the trust of government bodies and larger companies.

Younger developers and start-ups were more likely to try to build their own mobile applications, often aimed at the mass market. There were some very

successful examples among the Kenyan sample, but in many cases, the most successful applications were not produced and marketed by developers alone, but rather by people with a deep knowledge of the targeted market who drove production and distribution, relying on a developer co-founder for the technical part.

One example is an e-agricultural application developed by a farmer in collaboration with a developer. The farmer in question had been involved in a foundation that provided information to farmers about organic farming. In 2005, she realized that "it became really, really apparent that [they] didn't have very much of the strength and service on the ground in delivering information knowledge to farmers" partly due to the structural adjustment programs of the 1980s that had cut back government extension services. So she decided to use mobile phones to spread the organisation's information into rural areas. She was advised by one of the iHub founders to get "a good developer and a good lawyer". She had no experience of the developer community and explained that she had to "become very street smart in the space that [she] knew nothing [about]". She felt there was a disconnect between the people who know about technology and the people who most need technology, explaining

We need to stop assuming that it can only be done by the techies and we need to start letting the rest of the world know that they can do this.

This was a common comment from the interviewees, especially from representatives of technology innovation hubs and business incubators like kLab, m:lab and iHub: developers were seen to need a broader set of interactions in the wider economy in order to understand how economic and information systems can best intersect in everyday life.

For instance, one developer had struggled to launch a food delivery service. This was largely because whilst he and his team had the expertise to create the digital tools for the service (i.e. the tools to become an intermediary), they didn't have any of the requisite skills or experience to be an intermediary. He noted: "what happened more and more...I stopped being a software company, I became a...logistics company that provided a little software on the side".

Expanding one step at a time

In terms of expansion strategies, most Kenyan developers are focused on the Kenyan and wider African market, and are apprehensive about expanding further. A large Kenya-based development company was planning to expand into "five countries in two years and 20 countries [after] another five years" but this expansion was "all in Africa". When asked if the company ever got contacted by people in other regions outside of Africa, the manager replied,

All the time. All the time. South East Asia,...South Americans, a lot of the emerging markets, very similar problems to what we have here. The only challenge is that we absolutely have no capacity to go out there. I think we have so much fish to fry here [b]efore we can start looking at elsewhere. But... if we get a really good deal... That means that we can widely go on our software and give it to a reseller say in Brazil, we can consider it. But I think we said look, at least for the next three years let's, let's concentrate on our Africa plan.

This sentiment was evident in another company that specialised in agricultural applications. This company had been contacted by potential clients in Uganda, Rwanda, Ethiopia and Sierra Leone, but when the manager was asked what prevented her company from moving into new countries, she replied:

At the moment we are just busy doing what we are doing, staying where we are and getting our model right here. So there is lots of work still to be done. We are very young; we are a year old, just 15 months old from the time we went to market ... A lot of our learning [involves] dealing with farms on the ground because in some areas now, we have said okay we, we've fixed that. Now how do we scale what are we going to do? [After that,] we are ready to cut and paste the model. It should work in other countries.

She explained that the company's scaling strategy was ultimately about developing and perfecting its outreach in Kenya, explaining that "having a bigger team doesn't mean you are going to reach out to more farmers". She felt that the Kenyan market was big enough, estimating that 80% of Kenya's 40 million people were engaged in agriculture. The size of the local market meant that the company wanted to improve its services and involve more farmers from different sub-sectors before it moved into other countries.

These kinds of responses (i.e. that African and Kenyan markets are big enough and a more appropriate challenge for young Kenyan startups) were common throughout the ICT innovator sample. Developers were most interested in exercising their competitive advantage of intimate knowledge about a market or on speed and nimbleness over incumbents and large firms. One developer of accountancy software aimed at the SME market commented:

Yes, we're very worried those [larger financial software companies] are actually our main competitors...So we're trying to bank on the first mover benefit and try and push what we have, as fastest and as furthest as we can. So by the time the big companies land here, we already have our own markets...

The advantage we have over them is that we understand the way the businesses in Kenya here are run best, and we've developed a solution that's actually focussing on them, not something they're trying to adapt to.

ICT connectivity enhancers

Kenya has been home to a large ICT sector for longer than Rwanda. The sector is therefore characterised by significantly different value chains of ICT connectivity enhancers. Notable examples in the Kenyan sample were IT systems providers and various international IT and ICT companies that set up an office in Kenya to improve their local presence.

Sector evolution and skills upgrading

Many interviewees described the way the sector has evolved over time. For instance, the manager of a network hardware company noted:

I remember just when ISPs had just started coming into the market. We had very few ISPs, and then [at some point] there was an explosion of ISPs...There was a lot of demand for networking, so we just first started with that product line: basically as a networking organization. Then of course after two, three years there was a shift in the industry whereby people wanted more than just a network. You know, they wanted a proper data centre; so we now started going into high end computing in terms of partnerships.

Initially we had partnerships with Cisco. We now had to go partner with Oracle, and those days there was also SUN Micro systems...What that the company has done, is evolved with the way the global industry has evolved. At the time we started, networking was the in-thing, then it went to high end computing and then right now the big buzz words is in things like 'big data'; in things like analytics. Trying to do the very high-end kind of apps. We've realised that our biggest highest value will be in apps, right? So we've started building a very big practise within the apps space.

Another company (a software solutions provider) echoed this kind of transformation:

We started off in 1999 to 2000 as a website development company and that's what we were doing, basically websites. I think at the time, that was the hottest thing. Internet had just landed in Kenya. People were starting to get excited about it, companies wanted to start getting involved and being aware and that kind of thing so it was a niche for us. But what quickly happened is that more and more people started doing websites so we moved on to the next thing. Right about the time when we were moving on—that's 2003, 2004—mobile was just landing in Kenya in terms of mass adoption so you had more and more people with mobile devices. They got smarter, cheaper, and what that meant is that we could play around with different things. And as the years went on, we realized we're very good at automating supply chains. So that's what we concentrated on, and we got

rewarded much later because we started being known for mobile supply chain automation. In agriculture and in retail. And now most recently in research.

This ever-changing, demanding landscape helped establish the careers of young Kenyan developers and technologists. As in Rwanda, informal IT supply and basic website design proved to be a gateway for young entrepreneurs to transition into more valuable and high-skilled positions, as they found their own niches within the market. The two quotes above represent companies that started in a largely informal, student-run capacity and are now among the largest IT companies in Kenya, combining both ICT connectivity-enhancing and innovation value chains.

Developers similarly used evolutions in the ICT sector to upgrade their own skills, even if they did not build large ICT businesses. At times, basic connectivity enhancement work (such as website design) provided an opportunity to hone skills and gain familiarity with business models and practices in ICT. The manager of an e-commerce facilitator noted:

[B]etween 2002 to about 2004, even though there was all this connectivity increasing, what was happening is that it wasn't exactly translating directly into business yet...I think from 2000 to about 2003, I was doing roughly four, five websites ... on a monthly basis. Either on my own or working for someone. And a lot of these sites were basically just basic sites now...

Now the problem is that you've build brochure websites for two, three years. You kind of stagnated, ... you're not really growing on a web agency anymore, you're not becoming a senior creative or whatever, you're just a junior creative. I ended up being a PHP developer for close to ten, nine, ten years... I actually dropped things like C++ to move into PHP development was because of this whole centralized access thing...It became clearer that this is something that you can do a whole lot more.

International companies as bridge builders for local firms

Kenya's rapid uptake of ICTs has also attracted international IT companies into the country. These international firms now have fairly well established regional businesses, usually based in Nairobi and have skilled workforces spread across many different countries, thus allowing them to enjoy economies of scale.

Importantly, these international businesses operate using tiers of knowledge and solution-finding. If a problem cannot be solved in a satellite office, it is forwarded to the African headquarters in Kenya. If the Kenyan office cannot solve it, then it's forwarded to a foreign office or partner's office, typically in India (we spoke to five firms that operate a model similar to this one). One

Kenyan company, established by an Indian manager, estimated that 75% of his technical expertise was located in India, but that Kenya had strong capacities both in mobile payments and in local content development. Another manager estimated that building content in Kenya cost him "15 times more" than getting it done in India. In other words, these companies are increasingly operating and thinking at the multinational level. Such examples are reminiscent of Moriset and Malecki's arguments that large ICT-based businesses can exploit both agglomeration and dispersion economies, depending on task requirements and the locus and transferability of knowledge (Malecki & Moriset, 2007; Moriset & Malecki, 2009).

Yet, as in the Rwandan case, the presence of international companies often functioned as a bridge builder for local companies to access foreign clients. One interviewee explained how her suppliers sourced work for her company:

The customer came to us through...an international supplier...And once we have done a good job, that means the customer keeps coming back to you.

Another example of a Kenyan partnership with a European company emerged in the context of the global recession, which created opportunities for this particular Kenyan company. The manager told us:

What we did initially when we did the [Kenyan] project, we worked with a Portuguese company... When the depression came to Europe around one, two years ago, some of those guys unfortunately lost their jobs. Since we had good relationships with them, we were able to form a company... So I am sure when we will be having this interview in another one year I will be telling you we have to get these three four five customers.

Finally, a manager of a Kenyan-based software testing company described how his company hoped to get international contracts through working with international companies doing projects in Kenya. He explained that all of his customers are in Kenya:

...because we are moving into other areas, into the other countries where these companies are... Like, for example where I am, they have branches all over: even in South America, even in India, even in Europe. So we are able to move out to where they are.

...you need to cut a niche in the market, and you can only do that by partnering, doing business with multinational companies.

7. DISCUSSION

These findings have shown that the story about the impact of internet connectivity on Kenya and Rwanda's BPO sectors is not a simple one. The idea of an ICT revolution that would generate widespread economic growth after the arrival of the fibre-optic cables did not materialize evenly and across the board. In the BPO sector, changing connectivity has not radically changed the roles that East Africa's geography and social relations within East Africa play. Both the Rwandan and the Kenyan BPO sectors ended up focusing largely on domestic and regional deals instead of clients from outside of Africa. We also saw that BPO sectors are intertwined with, and rely on, other sectors of connectivity-based enterprises, namely ICT innovators and ICT connectivity enhancers.

This chapter serves to examine and summarise why the sectors have evolved the way they did. We discuss our findings and carefully generalise across the particular contexts of Kenya and Rwanda. We iteratively examine the unique characteristics of the three sectors of connectivity-based enterprises before discussing commonalities.

Unique characteristics of connectivity-based enterprise sectors

BPO sectors

Diverse but persistent (re-)intermediation

The BPO sector, more than the other examined sectors, was characterised by powerful mechanisms of intermediation and an array of hierarchical value chain structures. Even though the region had overcome some infrastructural barriers through improved internet connectivity, other barriers remained between BPO clients and providers.

Distributed work platforms like Odesk and elance are often cited as evidence that the international economy is entering a flatter, more disintermediated era. Such hopes are partly misplaced. Internet connectivity is undoubtedly an enabler, but is not a sufficient solution to the difficulties that East African BPO operators face in engaging with clients over distance. Although individuals and smaller companies gain access to inflows of international BPO work from distributed work platforms, they usually only offer short-term, piecemeal work; which is hardly the kind of work that can sustain a formalized local BPO business. Figure 4 shows a stylised value chain for East African BPO operators.

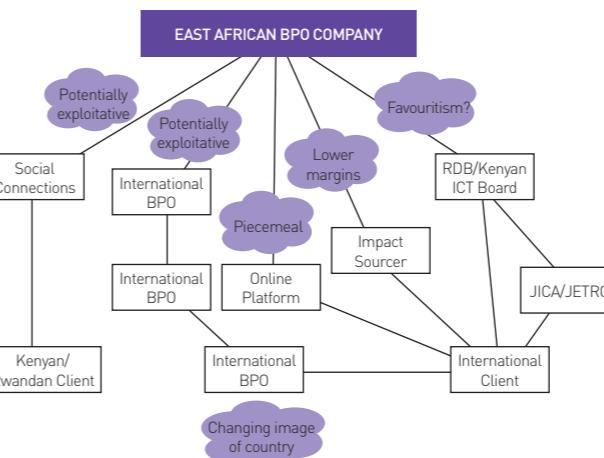


Figure 4: BPO chains

Figure 4 illustrates that there are numerous ways that East African BPO companies can try to access work. First, a company can try to access work from domestic clients, using its social connections and its sales staff to physically

visit premises and conduct pitches. Second, the East African BPO company can gain access to international inflows of work from either an international client company or an intermediary international consultant. Third, an East African BPO company can gain access to international inflow of work from distributed work platforms. Fourth, the East African BPO company can gain access to BPO work from impact-sourcing intermediaries like Samasource or become a local partner for an impact-sourcing company like Digital Divide Data. Fifth, governmental organisations like the RDB and the Kenyan ICT Board in collaboration with agencies of foreign governments can intermediate and broker work opportunities on behalf of East African BPO companies.

These observations support the idea of 're-intermediation'. Distributed work platforms, by virtue of their design principles, offered only certain kinds of barely-profitable and non-sustainable work in a 'take it or leave it' format. Better connectivity also allowed international consultants and more powerful companies to re-package and re-distribute work to Kenyan and Rwandan companies that are lower down in the chain.

Underestimated market forces of global BPO value chains

Policymakers, popular discourse, and BPO managers themselves originally underestimated the complexities of value creation and extraction in the BPO sector. They followed a belief in the (at face value enticing) vision of BPO as a simple and ICT-mediated redistribution of work from rich countries to places with labour cost advantages. Fittingly, a workshop participant in Rwanda described the beginnings of the BPO sector as a "gold rush", outlining how an in-depth understanding of the complexity of the market and industry has only started to slowly evolve in the recent past.

In reality, international inflows of work from outside of Africa were the exception in Rwanda and Kenya. More necessary conditions than just internet connectivity (such as social connections between clients and suppliers, service quality, higher skill levels, and scale efficiencies) would have to be met before local BPO industries would experience a boost from workflows arriving from international clients. In both Rwanda and Kenya, BPO operators were stuck at a limited capacity (quality and available scale) that did not allow them to work efficiently; which in turn would have been necessary to expand and/or attract better skilled workers.

For example, in software development, the wage per worker would often be lower in Rwanda compared to India, but Rwandan BPO businesses were still not able to effectively compete with Indian businesses because they lacked the capacity to take on larger and more complicated projects. kLab representatives mentioned that they received 7-10 software development outsourcing requests per month from companies outside of Rwanda, but could usually not find suitable BPO suppliers for this expressed demand. At times, local BPO companies themselves "re-outsource" their work abroad, hiring foreign companies, as this can still be cheaper than doing it locally for large scale projects. Accordingly, our interviewees spoke of many more constraints than internet connectivity; for instance, their labour costs, middle management skills, and (global) marketing strategies.

The downside of the internet's 'flattening' impact on the global BPO sector was also apparent: profitable BPO work had already been commoditized, and without differentiation and an a priori trust-deficit, Kenyan and Rwandan businesses could not compete with Indian and other Asian BPO suppliers. Instead, only very low-value work sometimes got passed on from India, which did not support the countries' competitiveness in global markets.

Finally, we found evidence of marked differences in subsectors of BPO that had not originally been apparent to policymakers and managers. For example, both data entry and software development businesses in Rwanda spoke of skill

gaps, but when probed further, the typical constraints in recruitment differed: applicants for data entry jobs often lacked ICT usage skills as well as time management competence, while software developers were missing a good understanding of customer needs and the context of outsourcing projects that they worked on.

Gaps in workers' skills on multiple levels hamper competitiveness
Multiple dimensions of human capital proved to be key assets for BPO companies, even for those that targeted what is usually considered "low-skilled" outsourcing work. Mostly technical skills were concerned, but we also found soft skills, attitudes and work ethic to be important. For instance, Rwandan data entry workers were described as diligent and reliable, motivated by the common cause to rebuild the country, but at the same time they were seen to lack time and task management competence.

Higher education institutions were found to be unable to fill these gaps comprehensively. The knowledge that they instil was often described as "theoretical", that is, not applicable or relevant in the marketplace. Participants also described that employees often displayed a mind-set of lacking vision and ambition, resulting in lower performance.

This implied that BPO providers had to train their employees themselves, offering courses in-house. In turn, this meant that they would have to make significant investments and build training competencies that were not part of their core business. For example, one participant explained that offering trainings would ultimately increase the seat price that he could offer. Overall, BPO businesses struggled to understand and adjust to the multi-faceted skill gaps of workers, limiting their opportunities for value creation and extraction.

Challenges of late-followers: learning and building trust takes time
In both countries, many in the sector went through a learning curve about the potentials and limitations of BPO work. The main learning outcome was that internet connectivity does not eliminate the need for direct, trusted interactions with clients and an understanding of their needs. Both continue to be easier to achieve in markets close to the BPO operator's own location or when temporary physical proximity (Torre, 2008) can be established, for example during shorter visits of international clients. It appeared no longer possible for Kenya or Rwanda to achieve the overwhelming scale efficiencies of Indian and Asian operators. In contrast, as early movers, India and Asian countries had a unique opportunity to service clients from all over the world and establish their reputation and (national) brand over time.

Accordingly, we found that seasoned operators in the BPO sector held savvy and level-headed conceptions about how changing connectivity is likely to alter the nature of geographical distance and social intermediation. They regularly encountered the challenges of accessing international work and knew that face-to-face contact and clients' favourable perceptions usually need to go hand-in-hand with internet connectivity in the BPO sector. One manager described why gaining access to domestic work was easier:

It's easier to do those deals because it's face-to-face; this is what I do, this is what my quality assurance manager is saying; it's more personal; it's more tangible

Dealings between foreign clients and East African companies need similar face-to-face contact and reassurance. For example, the Kenyan manager of an impact-sourcing BPO explained that there are still geographical barriers in the way clients perceived destinations like Kenya. She highlighted:

People don't know where Kenya is. They don't know where it is in the map. They don't know what it is. And so they, they send all these things about terrorism. The Philippines, where they [clients] are happy to send all their stuff, has been in insurgency for 30 years. But that doesn't bother them because they know that Philippine companies are successfully providing services to their neighbours down the street. But [about] our people, they

have no idea. And anything they might have heard is negative. So, you know, we're used to that.

She added that:

The largest clients that we've gotten from the US market have physically come here. And I mean one thing is you know they know that we actually exist, but they want to view the staff they want to see the facility that, you know, to be investment for them, to try a new country.

While managers throughout the sector expressed similar sentiments about the persistence of geographical barriers, they were still hopeful that such distance could be surmounted over time, through physical visits and social networking. The manager of a large BPO operator commented:

People who have outsourced or been in the outsourcing field for 20 years when they see a country like Kenya they can see it because they've seen it happening, they've seen it happen in the Philippines, they've seen it happen in South Africa, and they can feel that. So again, partnerships work. That's the best way to sort some of these things, because it's hard for you to walk into a New York office of somebody and tell them you want them to send their work to Kenya. They're going to throw you out of the door. But if somebody puts you in contact and they can vouch for you it becomes an easier sell; now it's about a competitive amount.

Interviewer: So the world is flat when you have relationships?

Interviewee: (Laughing) Pretty much. I mean that's how life works, yeah? If you think about it, think about politics and elections in the US, scratch my back, I scratch your back, yeah? Campaign for me, I'll make you an ambassador somewhere. Same thing here. I mean businesses across the world: it's people getting to know one another somewhere. Let's assume it's level: I advertise my company; you have an interest in my services: then it's about how confident do you feel about us offering those services? So at the end of the day if you're not competitive, it doesn't matter who you know, but if you're competitive, however you get your channel of marketing to relationships whether it's through PR, whether it's through any other normal channel is then how convincing can you be about the capability of your services. Once you get them through the door, how well can you deliver that service, that's what keeps people here.

This need for personal and proximate intermediation is also evident in Rwanda's more nascent BPO sector. For example, at a workshop in 2014, Rwandan BPO practitioners pointed out that large market potential could lie in the demand for document and process digitisation from local government agencies instead of focusing on international inflows of work. However, in 2012 and 2013, even though the sector was less advanced, Rwandan interviewees expressed a firmer belief in the elimination of geographical distance due to internet-mediated connectivity.

We speculate that this is due to the fact that few Rwandan firms had yet to experience the challenges of finding work on the international stage on a large scale; the Kenyan learning curve has simply been much longer. What has tended to happen instead is that work has come to Rwandan BPO companies, either through a supplier, an intermediary or a multinational based in their country. For Rwandan managers, internet connectivity so far felt like the most significant barrier to non-local business interactions, whereas in the Kenyan sample, managers tended to mention other barriers like social connections and limitations in expertise more frequently. It appears that internet connectivity is an initial hurdle that prevents managers from seeing other hurdles until it has been transcended. One Kenyan BPO manager expressed this sentiment particularly starkly:

Obviously again they can't access some of these jobs 'cause if we are dealing with the ability to deliver, ... at [the] human resource level [they are] inefficient, the inadequacy of the same, even when technology is available there is a constraint and this is part of what we are trying to resolve, [...] create an outfit that will be able to address the needs of

that external client. So it's not that technology is lacking, but it is not the solution, it is only an enabler.

ICT innovator sector

Enterprise-centric value networks

To discuss the ICT innovator sector, it is useful to distinguish between those businesses that implement ICT systems in existing companies (see 'upgrading existing systems' in Figure 5), such as digitising processes and building information infrastructures, and those companies that created new applications and software from scratch for the consumer market ('creation of new systems' in the figure below). The figure below depicts the stylised value chains of these two types of businesses.

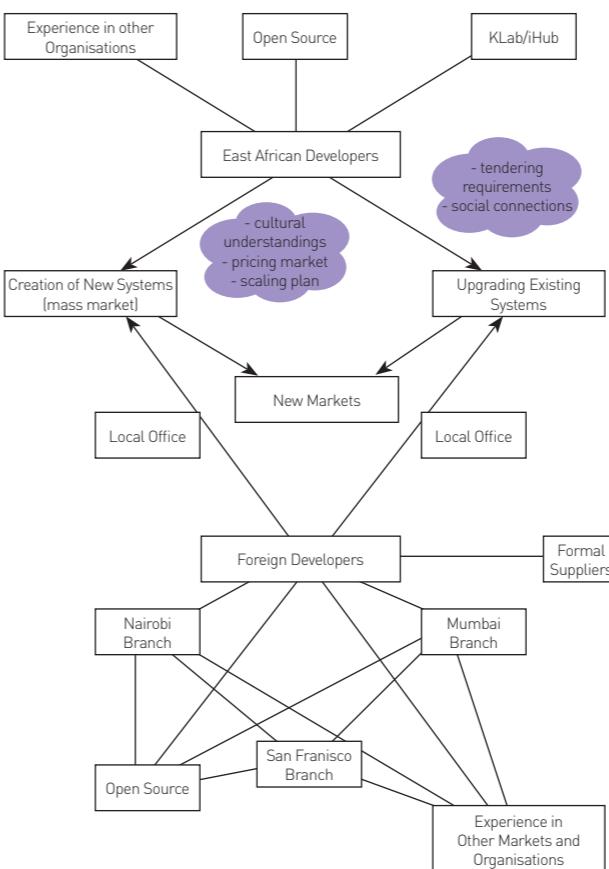


Figure 5: ICT Innovator chains

As indicated above, East African ICT innovators accrue value jointly from their technical abilities and by applying those abilities to sell solutions in a local context. Technical expertise can be gained from open source communities, educational programs and experience in other organisations. Using this technical expertise, the developer can then either create a new system for the mass market (on the left of the diagram) or upgrade an existing system (on the right of the diagram). The ability of the innovator to develop an application or platform of a newly identified market depends on their understanding of the user, their ability to understand the market and pricing model and their plan for scaling. The ability of an innovator to upgrade an existing system depends more on tendering requirements and also on social relationships with the organisation in question. The potential to expand into new markets is further dependent on whether conditions and market structures in the new market resemble those of the existing market.

There are also differences in the value chain of foreign ICT innovators present in Kenya and Rwanda. They are more likely to be connected to, or embedded in, existing transnational social networks and have more experience selling

to clients in their home markets. Because they recognize the difficulties of developing from afar, they establish a physical presence in East Africa in order to benefit from familiarity with the local markets. This combination and configuration of connections, skills and resources gives such companies distinct advantages for tendering. Despite a context of changing connectivity, and a theoretical ability to carry out non-proximate work, we therefore still witness a need for these firms to have a strong local footprint.

In sum, we see a less hierarchical array of value chains. ICT innovators are usually at the centre of a value network, rather than at the bottom of a value chain. They decide to develop an application or software that is new to a market, and thus appear to have greater influence over the conditions under which they operate.

Focus on 'local' from the start

This was mirrored in the growth and expansion strategies of ICT innovators, which, though ambitious, relied more on the decisions of business people and entrepreneurs as they reacted to immediately perceived market opportunities. This was contrasted with the BPO sector, where (at least initially) government interventions (including specific targets in Kenya's case) had set a vision and a course for the sector as a whole. ICT innovators also drew more substantially on technology innovation hubs such as kLab and the iHub to organise themselves by establishing grassroots communities that are not immediately driven by high-level policy.

The entrepreneurial approach implied a stronger and more immediate focus on differentiation and customer needs. From the beginning, this sector emphasised 'the local' where actors knew they would have competitive advantages over international actors. It appeared as if the ICT innovator sector had in part learned from failures in the BPO and other sectors.

For the gifted ones, a (new) sense of opportunity

Many entrepreneurs and software developers in the ICT innovator group felt that they were able to combine the best of both worlds (i.e. combine knowledge from a global world of software and entrepreneurial skills with unique local knowledge about subject-matter domains or traditional economic sectors), which international companies could not replicate. kLab, iHub and other technology innovation hubs again played an important role, since they provided bandwidth that allowed developers and entrepreneurs to access knowledge and resources available online (in particular, open source software); interviewees in the iHub and kLab often mentioned online learning resources like Udacity and stack overflow, in addition to the use of Google as "an academy".

But hubs also provided networking opportunities that would allow ICT innovators to initiate real projects (sometimes formed as start-ups) during which they could apply and test their knowledge, and to find out who and what matters. One of the managers of iHub described the learning process of one user of the facility:

They're driven by passion and the need to learn and keep on learning. Some of them have never...gone to university; they are actually self-taught...A veteran developer in Kenya [is] very well known, but you will never know [it] unless you sit down with him. And he keeps on telling me "you know we're connected with the world globally" and he says "as long as the internet is there, you can teach yourself a new skill every single day. You have so many resources at your disposal and now internet connectivity is not a barrier." I mean, you open any site and any academic site, you'll get books, you'll get resources which you can read and you can put yourself at par to anyone globally"...So in 2010, [he] taught himself android after he downloaded a [learning application] that came out around 2008, '09 and was very fresh. He taught himself programming and he's very good on the Windows platform. It just took him six months to actually download these sources from the internet,... sit at the iHub and he already had a network. And when people heard [he] was very good at android, Oh my gosh everyone wanted him, like because he's good and we have developers like that.

At the same time, examples where individuals turned their skills into sustainable economic activity mostly concerned a privileged few who have had the opportunity to physically travel to other countries in the past. For example, when one interviewee was probed about how he gained consultancy contracts, he revealed that it had been through a social connection from abroad whom he had physically met. Another ICT innovator described how he lived in a "global village" and used the example of online commerce. When asked how he managed to pay for goods, he revealed that he had friends in the United States who could pay for him. As in BPO, the whole world becomes flat only when you have social connections across all of it. These social connections are sometimes made online, but most of them are made through face-to-face contact at conferences, training programmes, competitions, and through international work experience.

There are not many examples that would clearly point to large-scale or transformative economic effects of the ICT innovation sector at this point in time. For example, businesses in the ICT innovation sector rarely offered mass employment. It is therefore difficult to see any obvious trickle-down effect of a few entrepreneurs' success, and so far it remains unclear if the ICT innovation sector can ultimately fulfil the hoped-for results of a rising BPO sector. It will be important for future research to better understand whether innovation clusters around technology hubs can become gateways for fresh talent to enter into circles of expertise and opportunity, or whether they create an exclusive elite that does nothing to alleviate economic inequalities.

Notwithstanding, Kenya, in particular, has used the ICT innovation sector to regain the sense of opportunity around ICT that had briefly been lost after the sobering choke on the BPO sector around 2008 and 2009. Now it aims to position itself at eye-level with other African ICT start-up hubs, in particular, Nigeria and South Africa. In this context, Kenya is starting to build a reputation as an exporter of ICT applications to other countries with markets where conditions are similar. This includes mobile money applications, but also mobile agricultural systems, mobile health systems, etc. In other words, we have seen a shift where conceptual connectivity (understood as foreigners collectively and universally trusting locals) has been increasing for one sector and decreasing for another: International BPO customers continued to generally distrust 'Kenyan BPOs', but international actors, especially in impact investment and international development circles, started to give 'Kenyan start-ups' an upfront trust and excitement bonus.

ICT connectivity enhancer sector

Dynamic and diverse value chains and networks

As a broad category, more dynamic and diverse value chains and networks are present in the connectivity enhancer categories of companies. Both small and large companies were constantly changing their products and relationships in response to technological change. Figure 6 depicts these value chains in a stylised fashion. To introduce a useful distinction, the diagram differentiates the value chains of relatively informal, independent and small companies (such as the aforementioned payment intermediaries in Rwanda or freelance website designers in Kenya) on the right, and the chains of a more formal and larger companies, often networked across Africa (such as the aforementioned network hardware company), on the left. We will simply call the one category 'informal' and the other 'formal' in the following discussion, even though the differences are actually more complicated.

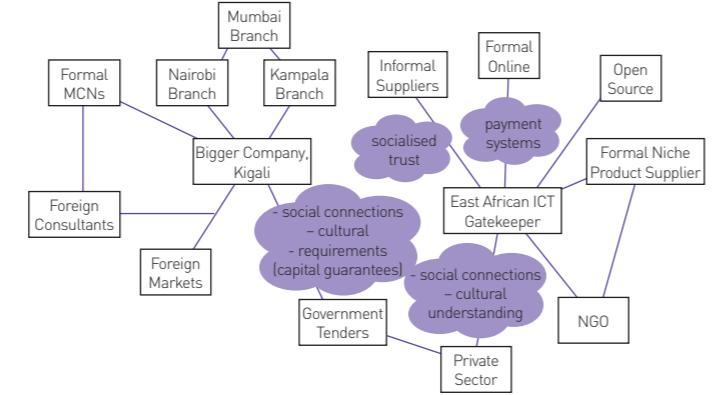


Figure 6: ICT Connectivity Enhancer Chains

International connections for informal companies usually entails them sourcing some of their inputs from informal suppliers in other countries. The informal connectivity enhancer usually attempts to establish a social relation and trust, maintaining contact through communication technologies following short visits. Inputs can also be sourced through online channels using credit cards or through interacting with open source communities. Informal companies sometimes transition to a more formal status by establishing codified relationships with niche suppliers. The clients of such companies tend to either be either civil society organizations and NGOs, or the domestic private sector. In both cases, trust and occasional physical visits are used to gain access to opportunities and reinforce relationships.

The formal companies on the left of figure 5 maintain relationships with other partners, often within a more formalized regional network. Many of the companies in our sample had their headquarters in Nairobi, while keeping offices or representatives in other countries. These kinds of companies were more likely to maintain ongoing relationships with multinational companies (MCNs) and otherwise established companies in other markets. They also use these relationships to themselves enter new markets. They have a stronger focus on applying for large contracts and government tenders.

Transitions from informal to formal connectivity enhancers or ICT innovators
Interestingly, working as or for an informal connectivity enhancer business can lead to transitions towards more formal employment or the take-up of an entrepreneurial career as an ICT innovator. Given its longer ICT sector history, this has been observed more often in Kenya: some young Kenyans managed to create niches for themselves in the early 2000s and have now established themselves as competitors to the big IT companies with connections to India. For example, we saw that by starting with self-taught website design, individuals can build up their technical abilities and were able to transition into other fields; and it is possible that economic actors in Rwanda might be following similar trajectories in the near future.

Today it is much harder for young Kenyan entrepreneurs to capture 'low-hanging fruit'. On the other hand, with changing internet technology, we see customers' changing needs for new services that enhance the value of internet connectivity. Here, Kenyan and Rwandan informal enterprises may have advantages over formal ones if they can use their flexibility as well as their familiarity and cultural knowledge to better understand, and capture value from, the customers. East African governments might also be well-advised to think about their tendering requirements, considering how to design them in a way that smaller, local, companies have a fair shot at competing for government and parastatal contracts.

Commonalities of connectivity-based enterprises

Skills, learning and knowledge as the key link between connectivity-based enterprises

The most important link that we found between the value chains and networks of the three examined sectors of connectivity-based enterprises were dynamics of learning and skill formation.

Across all sectors, technical skills were important. Naturally, software development (and related skills such as website design, graphic design, mobile application development, etc.) was a field that was important for all three sectors (in particular once the BPO sector had moved beyond call centres). Internet connectivity, especially by providing access to open source software communities and resources, had a meaningful impact on enhancing the skills of Kenya's and Rwanda's work forces. Moreover, for all three sectors, we discovered a positive feedback loop: the stronger the skill base, the stronger the value addition of the connectivity-based sectors, the more value can be extracted from internet connectivity itself (e.g., through network effects and a greater number of services), the more attractive it would be to obtain skills, the more people would attain software development and general ICT skills, etc. In other words, the value of internet connectivity and the value of ICT-related skills and in particular software development skills mutually enhance each other over time.

It was also very clear across all three sectors that actors were not able to build connectivity-based enterprises based on the technical skills that they received at local universities and schools alone. Instead, hands-on mentoring and training beyond technical skills, coupled with exposure to new contexts and networking opportunities, usually generated individual success stories. International exposure, in particular, enables actors to leverage the 'best of two worlds', using social connections and applying new skills to local contexts.

Here, the matching and levels of skill sets was crucially important; BPO companies struggled because of a lack of both qualified workers and qualified middle managers. Similarly, software developers were often missing business skills and acumen to develop profitable ICT innovations. In other cases, the limited number of qualified software developers could not be retained when they were not given good enough conditions, which in turn limited the scalability of BPO businesses. In other words, the supply of matching labour can be nontrivial even in ostensibly low-skill sectors like BPO workers, and a lack of tacit and experiential knowledge can be a key barrier that might not be obvious at first sight.

This also implied that, for all three sectors and in both countries, workers and entrepreneurs needed time to learn and advance. Kenya's ICT innovator sector, for instance, benefited from a nascent IT and ICT industry that had been established long before the arrival of the fibre-optic cables. Similarly, the country's BPO sector needed to learn difficult lessons on BPO value chains and the (im)possibilities of attracting international work the hard way.

It appeared that changing connectivity certainly enabled the creation of businesses that otherwise would not have been possible, but this did not spare them from the effort associated with experimenting, learning, and sometimes failing, before they could better understand and more easily manoeuvre through the complex market dynamics of connectivity-based enterprises. Local knowledge spillovers (or transfer) within and between sectors, digitally mediated and face-to-face, played an important role in maintaining useful lessons, which might explain the recent prevalence of technology innovation hubs. Similarly, we saw that internet connectivity was often only realised to be an insufficient enabler by itself once it had been made available; managers needed to learn about other complementary enablers. The manager of a Kenya-based systems integrator expressed this idea with the following statement:

I feel it's more than technology. It's something beyond technology. Technology is just a one step. A hurdle crossed. But the rest is totally up to what you do.

ICTs only bridge distance once social connectivity and trust are in place

It was also clear, across all sectors and both countries, that ICTs cannot replace or render superfluous the need to establish trusted social relations with clients and business partners to enable economic interactions. Existing social connections were very commonly a prerequisite for business deals.

This is particularly striking because all of the businesses that we examined, and in particular in the BPO sector, were predicated on ICTs' distance-bridging potential. They engage in value creation and extraction chains that serve (end) customers at a distance, without face-to-face interaction. However, this is often insufficient for the creation of any larger and more sustained economic transactions or relationships. In the BPO sector, the crucial necessary step that was often missing was a trusted relationship between a Rwandan or Kenyan BPO company and an international client that would give them a (large) outsourcing contract. Lacking conceptual connection—a collective and a priori trust between East African companies and foreigners—was often an important initial burden before any company could even be able to prove itself as trustworthy in a one-on-one relationship.

It was particularly interesting that businesspeople in the three sectors held different views about ICTs having a limiting impact on distance and intermediation. Many respondents repeated popular clichés and tropes about the role of ICTs in impacting geography and distance, but when they were pressed to reflect more deeply about their experiences in the context of their business experience, many qualified their statements with more nuanced statements.

On a superficial level, respondents appeared to be great believers in the distance-bridging potential of ICTs. Typical responses to the question of whether the internet has changed the way they perceive geographical barriers included the following two quotes:

Now it is actually improving many things. First of all, the need to travel. You can work remotely with those companies in India, they never came here. We work together. We have a shared common server and then you exchange [files]. That can only happen when you have fast internet connectivity. And also, ... in terms of training, you can have online training, you have sessions on videoconferencing... sometimes on forums, we chat and we have conferences. You don't need to travel.

Definitely, definitely, for example, ... Twitter. I connect with people that there is no way I would have connected to them otherwise... I mean the chances of us having connected... at any other time are so rare.

Representatives of internationally operating companies were also more likely to subscribe to beliefs in a decrease of spatial frictions when applied to their business environment. They admitted that trust was established via branding, the disciplining force of corporate reputational risks and broader contractual arrangements between companies. One manager of a large IT company with offices across East Africa commented that his company did not have trouble trusting suppliers "Because [they had been] in the same industry for long years, so [they] know by filter[ing] around and work[ing] with some trust". Another commented that trust was not a big issue for him because he only worked with large multinationals.

For these companies, the internet did appear to lower transaction costs and support seamless exchanges across distance, in line with Moriset and Malecki's (2007; 2009) findings on global digital production. Within established networks, where trust had been institutionalised and regulated by certificates and proprietary access, people could non-proximately communicate more

easily and freely. A Kenyan manager commented how the internet reduced the friction of business, describing how:

Time is money. For the business, you know I can't wait for one item for 10 days to get a response. If I send you email I don't get a response, I pick the phone, I call. [The Internet] reduces the time frame to move things faster, making deals, this and this or whatever. And it's easier for you to know or find a solution. Very simple.

A Rwandan manager similarly pointed to a reduction in spatial frictions:

When we are trying to partner with a company that is abroad, we can access to their application servers, they can access to our servers and install their applications on our servers with their own expertise. We give them access to the grand servers so that they can work on them directly. Because of that, faster internet, we don't need people traveling.

However, our respondents expressed more moderate views where implementation of applications and software in different geographical contexts was concerned (at least if an a priori trust framework was not in place). In these cases, respondents felt that establishing trusting relations required initial face-to-face contact. One Rwandan IT supplier clearly pointed out that face-to-face contact was always necessary initially, and that it would continue to be needed when trust remained missing:

[I] get to trust them, especially these commercial companies I deal with in the, in U.K. I know that they're gentlemen.

Interviewer: How do you know if they're gentlemen?

I have been there. And I have seen ... their working mechanism, how they establish their business and the trust they have.

When asked about his relationships with suppliers in Dubai, he commented:

In Dubai I just fly there. I can't trust them...

Interviewer: Because of the trust issue?

[There are] very few people who can communicate to you online. At times you have to go there or you just have to use the phone? And once you use the phone they can't even give you the quotation. So most of the times you have to go there. And even when you want to buy the stuff to fly and go there.

Similarly, many respondents in different sectors expressed apprehension about going into new markets without a local partner to guide the intervention. One Rwandan informal IT supplier commented:

The hardware... for the call centre, I got it from Egypt...But the computer, I got it from Uganda. It's cheaper than going outside (East Africa). So that one, I just send them money, I find the representative of that company...So there is a trust.

Interviewer: So is all this stuff that you buy all online? You don't visit.

Most of them, I buy them online. [When] I do import-export, that's where I have to [physically] go to buy and see exactly the pricing. The problem with that will be to have someone locally that can easily go physically in a shop, look for the price,...agree how we'll pay the money, and make the follow up for the shipment. For that we'll need to have at least a partner on site.

Our findings support Marazzi's (2007) argument, that the appropriation of value from information (and ICTs) requires both technological infrastructures and "socio-cultural machineries" and forms of "cognitive capital". As countries like

Kenya and Rwanda prepare to engage in flows of international service work, they must build up these kinds of infrastructures as well. But it is an inevitable challenge that much of this cognitive capital is grounded in social and spatial networks in other continents, and only some of it can be effectively mediated by digital technologies, usually once initial trust has been created through face-to-face interaction.

Domestic and regional markets are easier to access and can hold surprising potential

Skills and knowledge as well as the role of trust directly embedded in social connectivities and represented in conceptual connectivity (in terms of international clients' notions of a sector in Kenya or Rwanda) were also the underlying reasons for a key finding of this report: namely, companies in all three sectors were largely focused on workflows within Africa.²⁰ In Kenya, businesses were mainly focused on Uganda, Tanzania, South Sudan and occasionally West African countries like Nigeria. Rwandan-based companies were focused on similar countries, but also on the DRC and Burundi. Rwandan-based companies were also more likely to be interested in expanding into francophone West African countries like Senegal and Côte D'Ivoire. There were instances of trade outside of Africa, but most managers felt that their own economies and the economies of their neighbouring countries were most ripe for profit. They also believed that they understood these economies better than foreign (Western)²¹ competitors, and were therefore well positioned to expand into them.

Furthermore, as the domestic market becomes a site for learning and experimenting, unexpected potentials can be revealed. An interviewee who had worked for two BPO companies before becoming an impact sourcing advisor commented:

[W]e would like to get more work from the government...So we have had an immense targeting banks and hospitals and the government just to talk about how outsourcing can get into that. The Kenyatta national hospital for example, I'm told has data that date back to 40 years ago and they stated digitizing just a small section of it, I think about 40 million records or some big number like that...So when you look at all the faculties in the hospital it means that we haven't even scratched the surface. So there's a lot to be done.

And a manager whose company had struggled to get international clients commented:

We tried to talk to manufacturers about outsourcing their distribution and stocking and knowing which depots need what and all that sort of thing, but they want to hold it in, I think it's trade secrets they're worried about. Alternatively, the Kenya government could promote outsourcing in the domestic market in particular with the government and the companies in which it has shares. So Safaricom has 1,500 people and they want to hire another 500, Kenya government owns a large part of Safaricom, if they were to say, "Safaricom, you need to reserve 300, 400 seats for Kenyan outsourcing business", that would do a world of good to any one of the one, two or three guys that participated in that, it could change their fortunes overnight.

As ever more of everyday life, economic transactions and state services become digital and digitised in Kenya and Rwanda, rapidly growing domestic and regional needs appeared to constitute the most significant growth opportunities for East African connectivity-based enterprises. Over time, the shifts in focus towards local markets might actually provide the foundation for businesses to become more competent and gather the expertise necessary to compete beyond local markets.

Gateways and gatekeeping

Finally, it is important to note the iterative pathways of transitions and upgrades of connectivity-based enterprises that were found in our sample. More prevalent and promising expansion paths proceeded from local to regional to global, and rarely was a 'born-global' strategy realistic. Given the role of social connectivities, firms faced gatekeeping barriers and were typically able to

international and practical exposure and sometimes flourish from there. It might therefore be productive for government and large institutional actors to open up such gateways and avoid (perhaps unintentionally) acting as a gatekeeper with barriers such as overly rigorous tendering requirements that exclude small firms and that therefore keep them from growing.

8. RECOMMENDATIONS

Our findings have allowed us to derive a set of recommendations for government agencies, policymakers, industry associations, and development organizations that aim to foster sectors of BPO and connectivity-based enterprises. These recommendations apply specifically to the context of Kenya and Rwanda but, with contextualization, they could also be informative for other low-income countries in East Africa and beyond.

1. Building skills on multiple levels

In 'knowledge economies', the human capital and skills of a work force become a major asset for businesses. The same is true for connectivity-based enterprises in Kenya and Rwanda that are facing a large gap between their skill demand and the available supply. Technical expertise is beginning to improve, but from software development to call centres, lacking management and soft skills (such as marketing, time / task management and dependability) are often a strain on businesses' productivity and competitiveness. Higher education institutions are called upon to equip graduates with more comprehensive and applicable skill sets, including experiential and tacit knowledge. There is also room for public private partnerships between universities, training institutions and enterprises (potentially subsidised or incentivised by government) to help students, freelancers and junior employees improve their job and income opportunities.

2. Identifying a competitive edge: Local and regional target markets can be a better fit

Local connectivity-based sectors that target international customers are bound to face international competition. When attempting to support a sector that is already well established in other countries, policy should carefully weigh what competitive advantage the local sector will have over foreign competitors. Labour cost advantages might not be sufficient and might not outweigh scale efficiencies and learning advantages that foreign competitors have already established. Competitiveness might rather be derived from unique knowledge of, and access to, local and regional markets. Geographical proximity can underlie the fit between the supplied and demanded expertise and also social connectivity. In most cases, local knowledge will be most relevant for local customers and not for international customers, so that the local market can be the site in which local competitive advantages are most easily actualised. International companies can face local competitive disadvantage due to lacking knowledge about ways of doing business or lacking social ties, or they might not find it worthwhile to pursue smaller projects. This fact thus offers local companies advantages even in sectors with value chains that are inherently based on internet connectivity and scale efficiencies, such as BPO. Government incentives, such as funds and subsidies, can be an option to further improve conditions for local businesses, but these measures need to be based on a realistic and in-depth assessment of competitiveness and social connectivity, which in turn influence current and future opportunities for value creation and extraction.

3. Adopting a holistic perspective: Different connectivity-based enterprise sectors are intertwined

When establishing a connectivity-based enterprise sector such as BPO, policy needs to pay particular attention to other sectors that have related value chains and that rely on similar input factors. Beyond internet connectivity, skills, reputation, regulation, the availability of mobile and electronic payments, access to risk finance and several other factors matter as enablers for connectivity-based enterprise sectors. Vicious and virtuous circles within and across related value chains have to be considered.

4. Considering social connectivity: Relations matter also for technologically-mediated exchanges

Internet connectivity potentially allows connectivity-based enterprises such as BPO businesses to trade and perform services across the globe. But there is an important difference between *accessibility* and *being accessed*. Beyond legal, economic, and infrastructure factors, connectivity-based enterprises, like any other business, rely on the awareness and the trust of their customers, suppliers, and partners to be able to make contracts and deals. These social factors are usually best established through personal contacts and social relations. Social relations can be established online, but this is usually the exception. For most people and firms in the sector, initial and occasional face-to-face contacts are crucial, even if the actual service provision happens digitally and remotely. Enabling temporary geographic proximity and venues for face-to-face interaction—for example, during events, conferences, and business and outreach trips—should therefore remain an important goal for governments and industry associations, even in the BPO sector.

5. Building a sector's reputation: Certification, quality control and transparency

Risks from a tarnished reputation are very real for connectivity-based enterprises. By definition, connectivity-based enterprises work with customers and suppliers that are in a different location and with whom they rarely have face-to-face contact. This means that trust is particularly hard to establish and sustain. If clients are generally sceptical of a country's sector, an individual enterprise will find it all the more difficult to obtain a chance at proving itself as a reliable service provider. Government agencies, policy, and industry associations have a role to play in ensuring the good overall reputation of a sector. Certification programs that confer seals of approval and that assure clients of quality standards could be one important lever. Another way might be to set up platforms for accredited connectivity-based enterprises, customers and intermediaries, enhancing matchmaking, accountability and the enforceability of contracts.

6. Setting realistic expectations: Collective learning takes time

Sectors of connectivity-based enterprises are part of knowledge economies. Implementation of technological infrastructures, including ICT and internet connectivity, is important, but actors need time to experiment and iterate through generations of value chains and networks that work for their context. Before any local sector will thrive, competitive advantages need to be identified and tested, and risks need to be taken; and all this will be taking place within complex socio-economic environments. These are never a straightforward process that can be planned and predicted from start to finish. Policymakers and institutional actors need to allow for collective learning and knowledge spillovers between different actor groups, and between different places and social contexts. Multi-stakeholder workshops and training play a particularly important role in this context. This helps to speed up the process of iterative improvements, maintain realistic expectations, or abandon an agenda if it fails to meet expectations.

9. CONCLUSIONS

In this report, we have outlined how policy, popular discourse and media became carried away by the promise of internet connectivity as the fuel for the growth of Kenya's and Rwanda's BPO sectors. In fact, the development of the two sectors has been different than predicted and hoped for. We derive three main conclusions:

First, it proved hard to foresee 'unborn' ICT sectors. New and unexpected value networks and actor groups emerge and develop over time. We saw that economic actors conduct myriad adaptations and small experiments, learning and adjusting to market realities. Policy-makers and high-level planners can set the course for the growth of sectors of connectivity-based enterprises, but our study suggests that it is unlikely that the course will be kept with precision.

Second, before the arrival of the submarine cables in 2009, internet connectivity was seen as a simple catalyst for economic growth, but this did not turn out to be true even to sectors of connectivity-based enterprises. When it came to *accessing customers and markets*, geographical proximity still shaped social connectivity (through personal relations) and localised cultural understandings, and these factors appeared to be just as important or more important as internet connectivity. Broadly, this study has thus confirmed that the appropriation of value from information and ICTs requires "socio-cultural machineries" and forms of "cognitive capital" in addition to technological infrastructure [Marazzi, 2007]. Kenya and Rwanda ought to continue to build these complementary enablers, in particular focusing on improving skills and human capital on multiple levels. In other words, internet connectivity generates its effects in interactions with other enablers of knowledge economies (such as skills and trust), and its maximum value will only unfold if and when such enablers are already in place.

Third, strategic opportunities to generate competitive advantages can differ markedly between global and local markets also for connectivity-based enterprises; trust and conceptual connectivity matter also for them. This study has shown that this resulted in the Indian and other South Asian BPO destinations, as early movers, having an advantage as they were able to build trust and scale efficiencies before Kenya and Rwanda entered the global market. As a result, the need to be (socially, conceptually, physically) close made it difficult for East African companies to access international work opportunities and they depended, to a large extent, on international intermediaries and experts. These international networks served to administer the flow of commodified work across the world, both through their social knowledge of clients and through their cognitive capital in understanding the costs and value of information work. In turn, Kenyan and Rwandan connectivity-based enterprises have recently been able to capitalise on their unique local knowledge and social connectivities. Thus, the study has shown that, for BPO that is based on globally commodified service offerings, competitive advantage could not be derived from emulating previous success stories.

ICTs and the internet have an intuitive appeal as powerful means to "make the world flat" and to enable seamless interaction and economic exchange across the globe, and indeed, ICTs and the internet are clearly effecting immense changes in East Africa's economies. Yet, our fieldwork has revealed little evidence to warrant the proposition that increasing internet connectivity alone is allowing economic actors to seamlessly transcend geographical distance. Our study has shown that the reality is more complicated, even for ICT-based sectors that are inherently based on bridging distance, such as BPO. The role of internet connectivity for the growth of knowledge economies continues to be a complicated one, and much still needs to be done by policy-makers, businesses, and workers to adjust to the changes that it brings about.

NOTES

1. In other reports produced in the context of this project, we examined the tea and tourism sectors of Rwanda and Kenya. They are available on the Oxford Internet Institute website (<http://ci.ox.ac.uk>) or upon request from the authors.
2. We will use the term "internet" to denote technological networks that underlie and enable internet protocol-based communication and information exchanges. "Internet infrastructure" refers to all technology (hardware and software) that the internet relies on to function, such as fibre-optic cables, 3G and 4G telecommunication networks, switching units and transmission towers, routers, etc. The term "ICTs" is employed more broadly, and includes any technology that is used for information exchange or communication, including the devices that the internet connects (such as connected computers and smartphones), but also mobile phones and other devices connected through non-internet infrastructure.
3. In other reports produced in the context of this project, we examined the tea and tourism sectors of Rwanda and Kenya. They are available on the Oxford Internet Institute website or upon request from the authors.
4. The following resources provide a useful overview: Friederici (2013), Government of Rwanda (2000), Graham and Mann (2013), Kenyan ICT Board (2007), and Waema (2009).
5. These cables included: (1) SEACOM, a privately owned cable, dominated by investment from South Africa, (2) EASSy, a public-private partnership between predominantly South African private investors (Telkom/Vodacom, MTN and Neotel) and development financial institutions (World Bank/IFC, EIB, AfDB, AFD, and DfID) and (3) TEAMs (The East African Marine System), an initiative led by the Kenyan government in partnership with Kenyan internet service providers (ISPs) and Etisalat, a telecommunications company headquartered in the United Arab Emirates. Seacom was formed by the coming-together of Industrial Promotion Services (a branch of the Agha Khan foundation in Egypt which owns a 26.25% stake), VenFin Limited (now merged with Remgro Ltd.- both South African, which owns 25%), Convergence Partners (also South African and owning a 12.5% stake) and Shanduka (also South African and also holding 12.5%). The remaining 23.75% was held by Herakles Telecom LLC (a US company). SEACOM came online in 2009, followed by TEAMs and then EASSy in 2010. In April 2012, a fourth cable, Lion-2, arrived.
6. These statistics were produced by the National Statistics Office of Rwanda (NISR), quoted by the World Bank (2013).
7. See Friederici, 2013, for a summary of ICT-related Rwandan policies and programmes, including important e-government, ICT education and public-private initiatives.
8. In 2000, it established the Rwanda Investment Promotion Agency in order to create a central agency for business registration and encourage more foreign direct investment. In 2001, it established the Rwanda Utilities Regulatory Authority (RURA) and the Rwandan Information Technology Authority (RITA) to regulate and promote ICT-based economic growth in the country. (RITA has since been subsumed into the ICT department of the RDB.) In the same year, it introduced a policy for Zero-Tolerance of Corruption (Porter et al., 2013). The quasi-private (i.e. the primary shareholder is the government) company, BSC is also developing data centres and cloud services to further attract new entrants into the country. There has been a particular focus on providing connections for West African companies to do business in East Africa.
9. In 2010, Onyango-Obbo (2010) reported that Rwanda was sending an average of 300 IT and engineering students to India per year.
10. As of 2014, the policy has not yet been fully developed and implemented. See Waema (2009) for details on the original policy goals and statements.
11. This was a World Bank program designed to support e-government and ICT outreach projects.
12. M-Pesa is a widely noted mobile money system that allows people to deposit, withdraw, and transfer money with a mobile phone.
13. Ushahidi is a software company, founded in Nairobi, that develops open-source software for information collection and mapping.
14. Examples that our research team found included the development of student management software, government intranet systems, payment and payroll systems for specific sectors or financial institutions, revenue collection systems like taxation, parking tickets or police fines, health monitoring software, polling software for radio stations, data collection systems for specific sectors, document management systems, social media applications for locating restaurants, and retail and distribution software.
15. Source: http://www.afdb.org.jp/file/japan/presentation_en/10Eng%20Revxirt%20Presentation%2015April2013.pdf
16. Some of this informal work is still taking place and, even within bigger companies, managers ask workers to create profiles on these online platforms in order to source work for the company.
17. See Vira (2012) for a description of the impact of the financial crisis on Indian outsourcing.
18. In other interviews, managers expressed similar suspicions about competitors sending work abroad but refrained from naming specific cases.
19. 'Impact-sourcing' is outsourcing in which work is only offered to members of marginalised and vulnerable populations.
20. For ICT innovators that address ICT consumers, competitive advantage for addressing local markets was established less through direct social connectivities, and more from market knowledge.
21. Asian and Middle Eastern groups are also well accustomed to working in these contexts, and indeed within our sample, we found many Indian entrepreneurs and others with connections to India and the Middle East.

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