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Ghana: The Politics of Entrepreneurship

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THIS CHAPTER SURVEYS HOW the Internet industry developed in Ghana between 1994 and 2004. Four areas of negotiation among the government, the National Communications Authority (NCA), Ghana Telecom, and the Internet service providers (ISPs) will be studied:

- Establishment of international satellite gateways by ISPs.
- The legality of voice over Internet protocol (VOIP).
- The funding of Universal Access Provision.
- The development and management of an exchange point and national Internet backbone.

Other critical negotiation issues exist, but these four have been selected because they had, and are still having, the greatest impact on Internet diffusion (though not all of them are controversial). The critical negotiation issues (CNIs) discussed in this chapter dovetail with one another, and so they need to be examined in chronological order.

Between 1994 and 2004, Ghana drastically reformed its telecommunications sector. Previously, the government-controlled post, telephone, and telegraph (PTT) company had a virtual monopoly and presided over an inadequate telecommunications infrastructure. Following reforms, robust Internet service providers and mobile operators actively challenged the former monopoly PTT, Ghana Telecom. Transformation was initiated under a plan called the "Accelerated Development Programme 1994–2000" (ADP), which was part of a structural adjustment program sponsored by the World Bank. It called for the separation of post and telecom services and their conversion into limited liability companies. Ghana Telecom became a partially privatized corporation with a 30 percent share owned by the telecom's management team (known as

GCom, a consortium led by Telkom Malaysia). In addition, the ADP established the National Communications Authority (NCA) to regulate the communications industry. The NCA was legally established with passage by the Ghana parliament of National Communications Act 524 in 1996.

By 2000 the ADP had achieved an impressive increase in teledensity from 0.34 lines to 1.16 lines per 1,000 inhabitants, and in public phones from 0.001 to 0.16 per 1,000 inhabitants. A second national operator (SNO), Western Telesystems (Westel), was licensed, and numerous private FM radio and television stations were operating. Forty-eight ISPs were licensed, of which about twenty were still operating in 2004 (these ISPs consume a total Internet backbone bandwidth of 25 megabits per second [mbps] into and 15 mbps out of the country).

Low-cost Internet access at Internet cafes is available in most neighborhoods in the capital city, Accra. Five of the country's ten regional capitals have points of presence (POPs) established by ISPs to provide local Net access. The regional capitals also have a growing number of Internet cafes and community access centers, although their appearance is not as rapid as in Accra. Some business organizations needing Internet access have purchased dedicated connections. Wireless and satellite connections provide consumers with alternatives to the dedicated circuits supplied by Ghana Telecom and Westel, which are sometimes hard to obtain. Studies estimate that Ghana had about 300,000 fixed lines, 550,000 mobile subscribers, 400,000 computers, 20,000 Internet subscribers, and 300,000 Internet users in 2004.[1] With a population of about 20 million, Ghana can improve these statistics.

A diversity of private ISPs and mobile companies compete with Ghana Telecom (still partially government-owned) and Westel, but the latter do not always welcome competition. Michael Best of Georgia Tech has charged that when Ghana Telecom was associated with Telkom Malaysia, it was one of the most abusive telecom incumbents in Africa. In light of such accusations, the relationship between Ghana Telecom and private ISPs is worth exploring. ISPs are in fact able to operate their own satellite gateways to the global Internet backbone.

The 1995 decision to license an ISP, Network Computer Systems (NCS), as a value-added reseller was not especially controversial. However, the June 1996 decision to allow the NCS to operate its own international satellite connections to the Internet was controversial, because under the ADP plan, Ghana Telecom and the second national operator, Westel, were the only telecom operators with rights to the international gateway. The fact that the ISPs could bypass exclusivity is important, because it removed a key bottleneck by which the two telecom operators could have maintained control over the ISP industry and thereby stifled Internet diffusion, a strategy that was used by incumbent telecoms in other countries studied in this book. The Ministry of Transportation and Communications, led by Edward Salia, saw ISPs as value-added resellers of data services, meaning they could not provide voice. The ministry did not anticipate that in the 1990s the technology would develop and allow ISPs to transmit voice calls. Therefore, the ministry was surprised when ISPs began transmitting voice using VOIP.

The second area of negotiations we will focus on is VOIP—specifically, when and why it was judged as constituting an unacceptable threat to Ghana Telecom's foreign exchange earnings hence classified as "illegal" by the NCA. Certain ISPs had their equipment confiscated and owners were even jailed. Later, the courts ruled that there was no legal basis for these actions except for the fact that ISP licenses only granted them the right to provide data and not voice.

The Ghanaian government—the president, the Ministry of Transportation and Communications, and the National Communications Authority—all accepted Ghana Telecom's argument that it needed protection from competition by ISPs offering international calls. Ghana Telecom argued that only it could roll out infrastructure and provide access in underserved areas, particularly rural areas, thereby fulfilling universal access needs (in Ghana, universal access is defined as having a telephone line in every locality of more than 500 people). The VOIP debate needs to be understood in the context of negotiations on the funding of universal access. This issue forms our third CNI. The fact that a telephone infrastructure is needed to connect to the Internet, and the ISPs' argument that by allowing them to develop an Internet-protocol infrastructure they could deliver voice and data at a cheaper rate, makes this issue a CNI.

Negotiations on the question of universal access have broadened to include discussions of which organization should oversee the deployment and funding of an exchange point and national Internet backbone. The question under debate is whether Ghana Telecom should be involved in an Internet exchange point (IXP), and if so, whether its participation will be anticompetitive. The Ghana Internet Service Providers Association (GISPA), an industry coalition, is poised to establish the IXP. But can GISPA raise the funds to build a national backbone, or should the government take the lead in this "public good"? This question represents the fourth CNI, and it is still being negotiated. The establishment of a national Internet backbone and exchange infrastructure is critical to the integration and maturation of local applications, services, and platforms.

CNI 1: Establishment of International Satellite Gateways by ISPs

Nii Narku Quaynor established the first ISP in Ghana, Network Computer Systems, on 18 February 1988. The first Internet dial-up subscriber signed up with the NCS in 1993. The NCS applied to the Frequency Board, the precursor of the NCA, for a "value-added" services license so that they could resell

international Internet connectivity directly. According to John Mahama, the former minister of communication, the NCS was granted a license because the trend toward convergence in the industry was not yet understood. Mahama pointed out that even in the developed countries of the West, convergence was still "futuristic and only in its infancy."[2] One key to NCS's successful application was that Quaynor's technical expertise and competence enabled him to negotiate an international gateway for the NCS.

The NCS originally utilized a dial-up connection provided by Ghana Telecom to connect to PIPEX, a British ISP. Users in Ghana dialed into the NCS and were routed via PIPEX to the Internet. In August 1995, following an increase in demand, the NCS migrated to a 14.4 kilobits per second (kbps) dedicated circuit from Ghana Telecom. The NCS then upgraded the Ghana Telecom connection from 14.4 kbps to 64 kbps. In June 1996 the NCS was granted a license to operate its own satellite connection to the global Internet. As noted, Ghana Telecom and Westel had been granted an exclusive international gateway until 2002. Quaynor maneuvered around the duopoly by negotiating with the NCA and the Ministry of Transportation and Communication for permission to implement his own international gateway. The primary rationale for Quaynor's request was that Ghana Telecom was not providing a reliable and efficient satellite connection to the Internet. The minister of transportation and communications, Edward Salia, wanted to encourage experimentation by an experienced Internet expert like Quaynor.

The NCS was convinced that it could provide better reliability to its customers if it could operate a separate international satellite connection. Because the government was a major user of the NCS's Internet services, it had an incentive to support the NCS's effort to establish a more reliable Internet gateway. Under an initial agreement, the NCS paid a bypass fee to Ghana Telecom. The bypass fee was fixed at the amount that the NCS was paying to the telecom for a 64-kbps dedicated circuit. Because the NCS was only providing a "data" service, Ghana Telecom did not perceive any threat to its "voice" service. This compromise was reached after intense negotiations.

It is important to note that Quaynor also served on Ghana's Frequency Board, the body charged with issuing international gateway licenses. Quaynor was entrusted with "this new Internet thing" by senior national management. Kwami Ahiabenu II, the executive director of AITEC, says of Quaynor: "one important and fundamental point about Nii, he was seen to be providing a developmental service; meaning NCS was seen as a literal ISP to the government and its agencies, rather than a private company."[3] Ghanaian policymakers equated voice services with Ghana Telecom and Internet services with the NCS. Ernest Wilson suggests that Quaynor's alumnus contact with President Jerry Rawlings was decisive: they both attended Achimota Secondary School, and this personal connection allowed Quaynor to successfully negotiate with

the government. Such connections are important in Accra (and all capitals), and provide a social network that, to some extent, supersedes tribal identification.[4]

In 1996, two other companies, Internet Ghana (IGH) and Africa Online, established ISPs in Ghana. Originally, the IGH and Africa Online used international circuits provided by Ghana Telecom. Later, they obtained permission from the NCA to operate their own international satellite gateways. Africa Online received authorization fairly easily from the minister of transport and communication. According to Mawuli Tse, the founder and director of Africa Online, the authorization could be revoked at the ministry's discretion.[5]

A license for a very small aperture terminal (VSAT) was granted to Africa Online in late 1998 to connect to Teleglobe. Technically, the license did not include permission to operate an international gateway and Africa Online was required to purchase international capacity from Ghana Telecom.[6] Prior to this arrangement, Africa Online was using a leased line from Ghana Telecom and was making similar payments for bandwidth to the telecom. Establishing a satellite dish on Africa Online's premises meant that the physical infrastructure was different; contractually, nothing had changed. According to Mawuli, it took about a year to convince the NCA and Ghana Telecom to accept this arrangement.

No major contractual problems arose between Ghana Telecom and Africa Online over the leased lines. It took a long time for issues to arise, mainly because Ghana Telecom was not well equipped to provide the links. "Once we got the contractual green light, the technical team at Ghana Telecom was very helpful with the implementation. People like Richard Gyawu, Emmanuel Idun and Appiah showed a lot of dedication to the job," says Mawuli.[7]

The Ministry of Transportation and Communication and the NCA agreed to license ISPs as value-added service providers of data. Furthermore, they were allowed to establish international satellite connections that gave them direct access to the Internet. Former minister John Mahama noted that, due to the proliferation of satellite coverage over Africa, ISPs secured international connections for significantly less through alternative carriers than through Ghana Telecom's costly Intelsat service.

It became clear over time that Ghana Telecom and the ISPs were transcending their respective jurisdictions of voice and data. The telecom viewed the ISPs as a "threat" because of their ability to terminate international voice calls around mid-2000. This issue is explored further in the next section, which addresses the VOIP critical negotiation issue. The ISPs developed better and more reliable solutions than Ghana Telecom; hence, most multinationals and diplomatic missions chose to do business with an ISP for voice, data, and video connectivity. All the entities that had previously gone through Ghana Telecom now routed their voice, data, and video communications via an ISP, bypassing the telecom. As a result, Ghana Telecom lost revenue.

Still, Ghana Telecom had its friends at the NCA who were sympathetic to its plight. In fact, the telecom was a close ally of the NCA; some NCA employees had worked with the phone company when it was solely a government-owned entity. Although they now worked in a different organization, some NCA employees still favored the primacy of Ghana Telecom.

But the ISPs had their own constituency within the government. Because the NCA and the Ministry of Transport and Communication were receiving good service from the ISP industry, they wanted the ISPs to prosper. Minister Mahama expressed this sentiment when he said, "there was also a driving desire to promote the spread of Internet service in the country for socio-economic development."[8] It was also clear, however, that not everyone in the Ghanaian government was pleased with the idea of giving out VSAT licenses to anyone who wanted to launch an ISP. Ernest Wilson quotes a former government official who, when asked about ISPs and their international satellite connections, said that his colleagues "regret the decision to this day."[9]

By 1999, Minister of Communications Mahama made the acquisition of ISP licenses from NCA automatic. Mahama said he did this in response to complaints about undue delays by NCA in processing applications for ISP licenses. Mahama also said that he was convinced to implement this measure by the plight of ISPs who needed licenses to raise capital. The directive stated that applications should be approved once all requirements were met by applicants. Many licenses were granted, but most of them are not operational for several reasons. Once again, complex negotiations are ongoing between the NCA and the Ministry of Communications over the rights of ISPs.

Based on the precedent created by the NCS, Internet Ghana, and Africa Online, the NCA—under the ministry's goading—continued to allow ISPs to establish their own international gateways. By 2000 the NCA was granting separate ISP registrations and VSAT licenses to most applicants who met basic requirements.

In 2003, Ghana's parliament passed a law on national communications regulations. This law provides the legal structure of the telecommunications industry. Internet service is classified under the regulations as a value-added service. As such, ISPs must register with the NCA, but they do not need a license. Under the 2003 regulations, anyone who operates a satellite earth station must have a license. The new regulations also stipulate that providers of telecommunication services must make their networks available to value-added networks. The following question must be posed: Why do the regulations say little about Internet service if there has been so much conflict about the relationship between ISPs and Ghana Telecom? According to Kwami Ahiabenu II, the NCA is expected to enforce the regulations; thus it is not a lack of "regulations" that confuses matters, but a total inability on the part of the NCA to perform due to lack of adequate capacity.

By approving the NCS international satellite connection, the government initiated a series of decisions that enabled the ISP industry to bypass Westel and Ghana Telecom's control of international connectivity. In pursuing this course of action, the government made it possible for ISPs to offer voice calls (discussed below). More important, the breaking of Ghana Telecom's chokehold on international connectivity allowed a new technology to flourish; consequently, a new paradigm in communications arose and Ghanaians were able to interact with the rest of the world at a fraction of the cost.

CNI 2: The Legality of VOIP

Many negotiations have been held on the question of whether Ghanaian ISPs can use their networks to support voice traffic. By 1996, technology began to appear on the market that allowed computers to convert "voice" into data packets that could be routed to another computer and converted back into voice. Thus the voice/data distinction was breaking down. Until this time, the government viewed the ISPs as data carriers and the telecom companies as voice carriers. Little did the government and the NCA know that the voice/data distinction was dying and that they needed to engage the reality of rapid technological evolution.

In an attempt to reduce the cost of calls to Ghana and increase their profits, certain phone companies outside Ghana routed calls more cheaply over the Internet through Ghanaian ISPs to the end-user in the country. These calls were carried over an ISP's international satellite connection. The ISP would then convert the "data" packets into voice and dial-out on modems to the caller's receiver. Although VOIP takes several forms, this "bypass" process was deemed as violating Ghana Telecom's exclusive voice license and as "illegal termination" by the government and the NCA.

Under the "settlements" system of international phone calls, Ghana Telecom terminated calls initiated by phone companies in other nations; in turn, those companies terminated calls initiated by the telecom. At the end of a business year, Ghana Telecom settled accounts with foreign carriers. Because the telecom traditionally terminated more international calls than it originated, it was paid an agreed rate for the difference. These payments were in hard currency and they were highly valued by both Ghana Telecom and the government. In short, international calling was a cash cow not only for the telecom but also for the government.

By 2000, however, Ghana Telecom found that the number of international calls it was terminating had dropped dramatically; profits fell as a result. The reduction in revenue was huge and could be seen very clearly on the balance sheets. Indeed the International Telecommunication Union (ITU) reports that

Ghana Telecom's revenue dropped from US$170 million in 1999 to US$89 million in 2000.[10] Ghana Telecom suspected that something was amiss. It soon determined that ISPs were terminating calls on their terrestrial network and collecting the hard currency that was Ghana Telecom's "due." Although the volume of international calls was increasing, this flow bypassed the telecom's gateway. Revenues were pouring into the ISPs. Ghana Telecom complained to the NCA, charging that the ISPs were stealing its revenue. In fact, some individuals and organizations that were not authorized or licensed ISPs were providing VOIP services. This group of illegal operators must be distinguished from the legitimate ISPs who held licenses and were providing a service that was consistent with their platform.

Ghana Telecom charged the ISPs with acting as Internet telephony service providers (ITSPs), and with causing the loss of year-end settlement revenues. Ben Adu, a consultant hired by the NCA, prepared a docket for the attorney general of Ghana. Adu also led a raid on Mac Telecom, Intercom Data Network (IDN), and Tin-Ifa Ghana Ltd., each a licensed ISP. Adu claimed that the companies were acting as ITSPs; with the help of the police, he confiscated their equipment and detained some of their executives. This action provoked a public outcry by customers and business partners of those ISPs. Tension ran high among various interests, including the ISPs, the NCA, the government, Ghana Telecom, the diplomatic community, and the general public.

The ISP owners who were thrown in jail petitioned the courts and logged a complaint against the NCA. The courts deliberated the issue and asked the NCA to justify its action. Surprisingly, the NCA could not provide the courts with tangible and credible evidence of wrongdoing by the ISPs. The courts ruled in favor of the ISPs and required the NCA to return all seized equipment. Furthermore, the NCA was ordered not to tamper with the ISPs provided that they decoupled the voice segment of their data operations. According to Mawuli Tse, the ruling points to the inability of Ghanaian courts to deal with technically complex issues. The NCA was slow in responding to the court decision because it wanted to appeal it. The IDN and Tin-Ifa bought new equipment so that they could restart their ISP business. Mac Telecom, however, went out of business.

The NCA changed position several times as it struggled to find a legal basis for their contention that VOIP deployment by ISPs broke the law. The NCA asserted that licenses issued to ISPs were for data and video traffic, not voice. When asked how to decouple voice from a video conference, the NCA reinterpreted this distinction. Some ISP customers were operating voice over their data networks as well. Indeed, the courts, the NCA, and the ISPs were grappling with the challenge of regulating VOIP, in general, and how VOIP was defined technically and legally. The essential difficulty was that the NCA had licensed ISPs to carry data, which includes VOIP. The situation was complicated because no explicit law declared all forms of VOIP illegal. Rather, the

NCA interpreted the law to suit its interests. It took the following position: it is not illegal for ISP customers to send voice over a private network, but it is illegal for companies to do the same on a commercial scale, terminating locally on the Ghana Telecom platform.

The NCA equated the operation of VOIP, which resulted in already noted revenue loss to Ghana Telecom, as "illegal termination." The telecom supported NCA's position. The key issue was whether the ISPs had the right to route international calls on Ghana Telecom's terrestrial network. The ISPs argued that because Ghana Telecom terminated traffic on ISP networks, the ISPs should have the right to use the telecom's network in the same way. The NCA's earlier acquiescence for ISP use of VOIP over private networks, which was made on the basis of incomplete information about a then infant technology, complicates the issue. ISPs had been granted rights to operate some VOIP services, but this decision was based on insufficient technical and legal knowledge, and insufficient definitions for adequate regulation. This should not be surprising, given that the ramifications of VOIP were not well understood either in Ghana or elsewhere in the middle to late 1990s. According to the NCA, during the five-year exclusivity period (until 2002), in which Ghana Telecom and Westel were entitled to exclusively operate the international gateway, such transgressions violated this entitlement. After 2002 the NCA began arguing that the ISPs did not have licenses to route international voice calls.

According to former communications minister John Mahama, "the whole problem was caused because at the time of the ADP and liberalization of the sector, the issue of convergence of voice and data services was not clearly understood by policymakers."[11] For example the gateway for transmission of data was therefore not viewed as a threat to exclusivity of the fixed operators. Hence at a point in time the ministry did not want to totally fault the ISPs as much as it did not want to take sides with Ghana Telecom.

Mahama's position was that VOIP technology had come to stay and could not be stopped. The Ministry of Communications hoped that Ghana Telecom would work with the ISPs within a framework acceptable to both parties. However, the telecom did not want to negotiate because it saw VOIP as a direct violation of its turf.

Frustrated with the NCA's inability to make a decision, companies such as Accelerated Computer Service (ACS) appealed directly to the minister of communications for permission to operate internal VOIP networks. ACS, a US company that provides business process outsourcing (BPO), was planning to establish a data processing center in Ghana with a thousand employees. It needed voice transmission to connect its Ghana and US offices, and was proposing a major investment that would create quality jobs. The minister of communications intervened and ordered the NCA to make a decision, within a week, as to whether ACS could use an internal VOIP network. Under such pressure, the NCA permitted the company to use VOIP for internal communications. This is

another case in which the NCA's lack of understanding and foresight could have resulted in the loss of a major investment.

The ISPs perceived a need to deal with matters on a collective basis; hence they began meeting and eventually formed the Ghana Internet Service Providers Association in July 2001. Although the NCS did not attend the inaugural meeting of GISPA, it later paid the sign-up fee, attended subsequent meetings, and participated in the group's listserve. It took time and a significant effort before Ghana's ISPs trusted each other enough to work together in a common cause.

GISPA believed that technology was outpacing policy and regulations. Technological innovation was opening new possibilities, and ISPs felt that they should be allowed to experiment with VOIP to determine how it could be used to provide more communication infrastructure, even to the rural areas, and at cheaper rates. GISPA argued that Ghana Telecom's loss of settlement revenue was caused by other factors besides the termination of voice calls by ISPs. GISPA held that the whole telecommunications landscape was changing. Ghanaians were using e-mail, chat rooms, and Internet faxes to communicate, instead of placing expensive international calls. In addition, after 2002, consumers were receiving international calls on cell phones provided by mobile operators who bypassed Ghana Telecom's gateway and network. Finally, GISPA asserted that settlement rates and revenues were falling due to market pressures.

In March 2003, Ghana Telecom implemented another strike against its competitors. It set all ISP phone lines to a receive-only mode, thereby effectively shutting off the lines used to place calls to its switched network. When this stratagem was effected, the ISPs discovered that they could not place outgoing calls even using their administrative lines. The ISPs cried foul to all who would listen; they contacted their allies in the government and within a week Ghana Telecom backed off. It could have enabled only the ISPs' administrative phone lines, but there was such an outcry that all lines were enabled. Later, Ghana Telecom implemented another strategy to limit the outward calling capacity of certain modem lines.

At the time, the NCA initiated a study to quantify the losses that Ghana Telecom was experiencing due to illegal termination over its switched network. According to an article published on 1 October 2003 in the *Ghanaian Chronicle,* the NCA study identified thirty-two illegal unlicensed VOIP operators.[12] This activity, according to the article, cost Ghana Telecom US$15 million in 2002. The NCA wrote each of the thirty-two ISPs, demanding that they reimburse the telecom for lost revenue. The NCA also threatened prosecutions for nonpayment. It was later discovered that none of these ISPs had authorization to act as an ISP; they were not licensed and thus defamed the legitimate ISP community.

Instead of a comprehensive approach based on principles for regulation, the NCA reacted to issues in a scattered rather than a unified way. This was

partially an inescapable result of regulating an infant technology. In many ways, these sets of negotiations and the failure to achieve a viable regulatory approach were significantly affected by the NCA's incremental regulatory approach, an approach punctuated by the NCA's decision to address issues in a piecemeal way. A series of NCA decisions based on incomplete technical and legal information and under pressure from senior government officials further muddled an already complicated policy environment.

Through negotiations held over the years, it became clear to all parties that voice could not be decoupled from data and video. Hence operators needed to establish a commercial framework that would allow this technology to grow. The acting director-general of the NCA, J. R. K. Tandoh, stated in a public forum that the NCA was developing a VOIP framework that would license operators separately.[13] An effort to develop a commercial framework for VOIP was also under way between Ghana Telecom and other operators, Tandoh added. A new framework is needed because Ghana Telecom and Westel's international gateway exclusivity has ended.

The arbitrage of international phone traffic has definitely funded the development of segments of the ISP industry in Ghana. Although only some ISPs have benefited from terminating VOIP calls over Ghana Telecom's lines, most ISPs sold leased lines connections to clients who then used those connections for voice calls.

CNI 3: VOIP and the Funding of Universal Access

To fully understand why the VOIP issue is so controversial in Ghana, one must understand the history of the debate over how to provide universal access in the country. Ghana Telecom claims that it needs the revenues generated by international voice traffic to expand access to telephones throughout the country. This claim, however, should not be accepted automatically. In fact, negotiations on how to provide universal access have been extensive and convoluted. This issue is essential because it creates the framework for Internet diffusion in rural areas; without a telephone infrastructure, rural communities may not be connected to the Internet. The most contentious issue, how to fund universal access provision, is complicated, because universal access is defined in several ways, and different operators hold competing positions on the question.

The ADP planning document cited universal access as a major concern. According to the ADP, universal access was achieved in two ways: first, all licensed operators were to develop infrastructure in their areas of operation; second, Ghana Telecom, Westel, and the mobile operators were to contribute 1 percent of their gross revenue to a universal access fund called the Ghana Investment Fund for Telecoms (GIFTel). This fund would be used to build rural

infrastructure. In particular, GIFTel funds would be allocated to develop infrastructure in regions that lacked service. According to John Mahama, then minister of communications, the ISPs, as value-added service providers, had no obligation to contribute to this fund (as well as universal access provision in their license or authorization).

Ghana Telecom and Westel provided the ministry and the NCA with a list of areas in which they were to develop infrastructure per their license. Hence the ministry and NCA decided to license other companies to operate in rural areas not covered by Ghana Telecom, Westel, and the mobile companies. The NCA licensed the first rural operator, Capital Telecom, which, using GIFTel funds and its own resources, was committed to building rural infrastructure in the eastern, Volta, greater Accra, central, and western regions. According to Mahama, the NCA considered licensing a second rural operator but did not do so.

Although Capital Telecom secured a grant from the British government's Export Credit Development Guarantee (ECDG), the company soon folded. Capital Telecom failed because it purchased equipment that could not perform, lacked managerial expertise, and feuded with Ghana Telecom over interconnection and with Mobitel over spectrum. With the failure of Capital Telecom, the plan to achieve universal access evaporated.

Most operators defaulted in their GIFTel payments because GIFTel was not properly established. Therefore, part of the reason for Capital Telecom's collapse was that the company could not draw on the GIFTel funds. According to Mahama, the Ministry of Communications' top priority at the time was not GIFTel, but establishing the NCA board and launching an independent regulator. Furthermore, the NCA passively observed as Ghana Telecom undermined not only Capital Telecom but also the second national operator, Western Telesystems (Westel), by refusing to interconnect. Capital Telecom futilely demanded interconnection enforcement and the establishment of GIFTel.

Ghana Telecom and Westel both pledged that they would deploy services in their areas of operation, and the mobile operators wanted to achieve universal access in their own roll-out plan, rather than through GIFTel. This is the key point of contention: the operators did not want to contribute to a separate fund; instead, they wanted to achieve universal access by building their own infrastructure. Ghana Telecom deployed new telephony in some of its operating area, but Westel failed woefully. By the end of exclusivity in 2002, the NCA slapped noncompliance penalties of US$71.5 million and US$69 million on Westel and Ghana Telecom, respectively. Under the ADP program, and per their licenses, such penalties were to be imposed if Westel and Ghana Telecom failed to meet their universal access obligations. Naturally, the fines generated tension between the operators and the NCA.

Ghana Telecom and Westel argued that they could not pay the penalty and at the same time continue rolling out new infrastructure. The companies requested a grace period, as they were facing a huge financial burden. It was unclear, for example, how Westel could pay the fine and avoid bankruptcy. The NCA maintained its position, but as a result of intervention by the Ministry of Communications and the president, the fines were reduced and allowed to be paid in installments. In fact, the fines were still being negotiated in 2004, although some payments have reportedly been made. The companies still object and complain that they do not earn enough profit to stay in business, even without paying the fines.

After Ghana Telecom's management team from Telkom Malaysia (the GCom consortium) failed to meet their obligations in 2003, the government of President John Kufuor brought in a team from Telenor of Norway. The government negotiated with Ghana Telecom's new management team on an agreement to deploy 400,000 new telephone lines and to provide telecommunication services to each town or village having a secondary school. This agreement constituted a new policy strategy by the president to achieve universal access. Underscoring the importance of universal access, President Kufuor explained the strategy during his first State of the Nation address to parliament and the people of Ghana. He declared that his plan entailed use of broadband Internet. Ghana Telecom therefore began piloting Internet services. Plans have been drafted to provide broadband services at low cost; this will inevitably drive some ISPs out of business. Ghana Telecom continually argued that it could meet the president's goals only if it earned sufficient revenue from international calls.

GISPA, the ISP trade association, claimed that it was unfair for the government to cause the collapse of indigenous private enterprise. GISPA members argued that, although their licenses did not stipulate any universal access obligations, they had contributed significantly to the growth of the Internet in underserved areas. The ISPs further argued that if they were allowed to use VOIP platforms, then they could quickly provide voice services as well. Some ISPs had established POPs in four of the ten regional capitals (as far as the northern region), and were ready to support such services. Most ISPs cannot justify investing in infrastructure in remote areas, yet they feel the need to do so. GISPA's former chairman, Leslie Tamakloe, stated in a public hearing on telecommunications policy that "it cost more to drive an IP from Accra to Tamale (Northern Region) than to Nigeria so the fact that we are not funneling resources to Nigeria should give our government a cause to support us and not break our back."[14]

By pressuring the government, GISPA convinced authorities to temporarily halt the launch of Ghana Telecom's ISP. GISPA wanted Ghana Telecom's ISP to be a separate business entity without preferential treatment. The ISPs also wanted to receive the same government support and access to capital enjoyed by the telecom. Even without government financial support, some ISPs had extended service to underserved areas.

Under the national communications regulation law passed in 2003, the universal access fund designated to support a third-party rural telecommunications company was abandoned. A new strategy was put in place: each operator was to provide and extend its services to the entire geographical market that it was licensed to serve. All companies, including Ghana Telecom, Westel, the cellular operators, and new operators with national licenses, were required to build infrastructure in the rural areas. Russell Southwood, chief executive officer of Balancing Act Africa, took exception with the new strategy.

Under its Telenor management team (in place in 2003), Ghana Telecom is still making the case that it is best positioned to provide universal access in the country. The question Ghana Telecom faces is where will it obtain the funds to support universal access. The World Bank and other multilateral agencies are reluctant to lend or grant it the capital necessary for expansion. In 2000 the World Bank agreed to provide the telecom with a loan of US$100 million for the upgrade and expansion of its network. After the change in management at Ghana Telecom, this loan was approved but not disbursed. According to the Bank, the terms and conditions under which the loan agreement was reached had changed, and so the money would not be forthcoming.

At the same time, Ghana Telecom's new management had signed a contract with Alcatel to purchase equipment for network expansion. Additionally, Ghana Telecom secured credit with the Chinese government to finance equipment purchases from Alcatel China. Due to litigation between the Ghanaian government and GCom (the Malaysian-backed consortium that owns 30 percent of Ghana Telecom), a court writ was issued holding up disbursement of a finance agreement between Alcatel and Shangai Bell. The Ghanaian government is currently fighting the Malaysian-led consortium in court, and the minister concedes that obtaining an out-of-court settlement would have been preferable. The minister cites the high cost of court proceedings and denounces the Ghanaian members of the consortium who have sided with their Malaysian partners.[15]

It can be argued that Ghana Telecom's change of management was not properly implemented by former minister of communications and technology Felix Owusu Adjapong. As a result of the change in management, the World Bank loan was not disbursed and GCom took the Ghanaian government to court. As a result, it has become much harder for Ghana Telecom to raise funds. In addition, the telecom's strategy for achieving universal access has been hindered.

Until now, funds for ISP deployment have come from private sources. As the ISP community has become more sophisticated, more talks are being held between it and multilateral donors on the possibility of financing network expansion using Internet protocol.

The key question of Internet diffusion concerns how quickly market forces will drive the expansion of ISP networks throughout the country and into rural areas. A second question concerns whether Ghana Telecom will roll out Internet-protocol infrastructure in rural areas against the preferences of the ISP industry.

CNI 4: Development of an Exchange Point and National Backbone

Much debate has taken place on what kind of national infrastructure Ghana needs to support a vibrant ISP industry, who will build the infrastructure, and who will operate it. At the most basic level, Ghana's national infrastructure could take the form of an IXP located in Accra. At this Internet exchange, ISPs could interconnect and route traffic locally instead of through the US and other international backbones. At a more advanced level, a national Internet-protocol backbone could be established that would provide high-speed access to voice, data, and video (multimedia platform) for ISPs, telecoms, and mobile operators both within and outside Ghana. On paper, a national Internet-protocol backbone was to be implemented by the Communication Infrastructure Company (CIC), a private-public partnership that would combine all local infrastructures into one system. The government floated the CIC idea, but it never went far in terms of implementation.

The assumption that Ghana Telecom's circuit-switched infrastructure could serve as the basis for Ghana's telecommunications infrastructure is doubtful. Circuit congestion on the system is causing too many call failures and inefficiencies. By now, most of the copper that was used to build Ghana's telecom infrastructure is old and dead; those wires need to be replaced with new and better ones that can accommodate traffic demands over the long term. There is widespread skepticism that Ghana Telecom's bureaucracy is capable of establishing a reliable infrastructure.

Building an IXP in Ghana would be one step toward enhancing the country's telecommunications infrastructure. Ideally, an IXP will allow ISPs to route domestic traffic through other Ghanaian ISPs. An IXP can enhance response times and provide incentives for hosting websites locally rather than abroad. At one point, Ghana Telecom declared that it would establish an IXP. Later, the government sought to impose its position on the ISPs, but that did not happen. Meanwhile, the ISPs themselves where discussing how and where to establish the IXP.

The prospect of an IXP has been talked about since 1996, but one has not been built due to lack of cooperation in, and leadership of, the ISP industry. Previously, because the ISPs were isolated, it was impossible to implement an IXP. Beyond the technical aspects, creating an exchange point involves sociological and physiological challenges. In 2001, when GISPA was formed, discussions about a possible exchange point became more focused. The building

of "trust" among the ISPs that compete against each other, however, has taken almost three years to accomplish. Only now has creation of a Ghanaian Internet exchange point become realistic. One issue of contention was finding a "neutral location" for the exchange. Initially, the ISPs wanted an ISP to host the exchange, but that did not work.

Eventually, the government supported creating an exchange point, but demanded that it be managed by Ghana Telecom. Most ISPs rejected this proposal. Ghana Telecom argued that because it had the most connections to the ISPs, it was in the best position to establish an IXP. The ISPs were skeptical of Ghana Telecom's neutrality, because the telecom was about to launch its own ISP. In addition, most of the ISPs experienced Ghana Telecom as hostile and unreliable, and so trust was lacking. In short, the ISPs did not want the exchange point to be placed under the control of what they believed to be an unreliable enterprise like Ghana Telecom. The ISPs favored placing control of the IXP in the hands of the BusyInternet Cafe (the largest Internet cafe in Accra, with a hundred personal computers in 2004); however, this proposal was withdrawn when BusyInternet began offering ISP services. The ISPs were also convinced that if the exchange point were controlled by an ISP, that operator would enjoy undue advantage. A consensus emerged that a non-ISP at a neutral location must oversee the IXP.

After the establishment of the Accra-based Ghana Indian Kofi Annan Center of Excellence in ICT in 2003, the government proposed that the center host the IXP. The center was designed as an autonomous, private training institution that did not aspire to be an ISP. With this second proposal, it became obvious that the government and the ISP community had agreed on the need for an exchange point. This consensus created a certain degree of understanding among the government, the NCA, and GISPA members. A series of meetings have been held on the establishment of a Ghanaian IXP under the auspices of the center. The center has offered to make a private room available for the exercise. The needed structures are in place and the exchange point will soon be launched.

An Internet exchange point will be an important first step, but Ghana's telecommunications infrastructure will be much stronger if it has a national backbone. Clearly, the current infrastructure does not allow for great expansion. Discussions are under way about what technology—wireless, VSAT, or fiber—is needed to create a new national backbone. A consensus seems to be developing around the idea of using fiber. Beyond the advantages of using fiber—speed, volume, and reliability—there is already fiber running through much of the country.

The government-owned Volta River Authority (VRA), Ghana's main power company, has a fiber network on its high-tension power towers. This network was the vision of Ghana's founding president, Kwame Nkrumah, who wanted the VRA to have an internal communication infrastructure. It is amazing that in the 1960s Nkrumah supported the use of fiber. The VRA realized the potential of its fiber infrastructure, and decided to develop it not only for internal communications but also in support of a national fiber optic backbone. To undertake this task, Volta Communications (Voltacom), a subsidiary communications company, was formed and licensed by the NCA with the concurrence of the Ministry of Communications.

The Voltacom fiber network runs from Accra through Cape Coast, to Takoradi, to Kumasi, and back to Accra to form a loop. Voltacom's services, however, were priced beyond what the market would bear. Only six companies, mostly ISPs and mobile companies, signed up for Voltacom's services.

The VRA could not support Voltacom with more money because its resources were dedicated to sustaining its main operation, namely power. Nevertheless, Voltacom rejected an offer by a foreign concern to buy a stake and to raise additional credit. Thus, while an existing viable national backbone potentially exists, it has not come to fruition. According to former minister John Mahama, the VRA was overly protective of Voltacom. Others believed that Voltacom did not know what it was doing because, as a government parastatal, it had no commercial strategy. In 2004 the government still had not forged a vision for Voltacom, but there were plans under way to "privatize" the company to encourage its expansion.

The second element needed for a high-speed national backbone is connection to the international Internet. In 2004, Ghana connected to SAT-3, an offshore undersea cable running along the west coast of Africa to Portugal. Some have proposed connecting SAT-3 with Voltacom to form a national fiber backbone. Not much cooperation exists, however, between Ghana Telecom, which controls the SAT-3 landing, and Voltacom. Because Ghana Telecom has maintained that it needs to develop its own fiber backbone, there is an effort to duplicate Voltacom's southern sector fiber network. Voltacom has activated its own fiber network, by itself, to the north. For a while, this provoked a standoff, but the Ministry of Communications and the NCA have established a committee to find a way for these two entities to cooperate on creating a single infrastructure for the national backbone.

An alliance between Ghana Telecom and Voltacom has not yet emerged. Yet it seems logical that an alliance will emerge on a fiber backbone, because it is simply too expensive for both companies to finance development of separate infrastructures. Significant parts of a high-speed national backbone exist. Such an alliance, however, will depend on strong leadership by the government. In 2004 a committee composed of representatives of all the parties began discussing how to move forward on a national fiber backbone. The government favors bringing in an outside strategic investor. The International Finance Corporation (IFC) has sent experts to Ghana to facilitate ongoing talks in Accra. The government has a major stake in both Ghana Telecom and VRA, so it should be easy to decouple their respective fiber entities and create a new

enterprise. A general consensus supports creation of a new fiber company that would establish a national backbone. This backbone entity would sell circuits to various operators so they can focus on providing value-added solutions to their customers.

The inability of the government, Voltacom, Ghana Telecom, and the ISPs to implement a national backbone has slowed the geographical dispersion of the Internet in Ghana. Therefore, ISPs have not sprung up in regional markets. A few ISPs have built their own national backbones, but these have been confined to several regional capitals. Thus, Internet diffusion has been centered on Ghana's capital, Accra.

Conclusion

The rapid evolution of the Internet in Ghana between 1996 and 2000 can be explained, in part, by the fact that the ISPs were able to bypass the Ghana Telecom–Westel duopoly. The ISPs did this by operating their own international satellite gateways. Thus, ISPs were able to provide reliable, low-cost service. Ghana's Internet infrastructure was partially funded by arbitrage of expensive international voice calls. Some of this arbitrage was done legally, when customers ran voice traffic over their data networks. Some of this activity, however, was illegal in the eyes of the NCA. Specifically, some ISPs terminated international calls using Ghana Telecom's local exchange network.

In 1999, Minister John Mahama made access to ISP licenses automatic. This reform encouraged many to enter the market. By 2000, heavy competition had driven down the cost of Internet access from US$100 to US$25 per month. Internet subscriptions rose rapidly, as any study of Internet diffusion in Ghana demonstrates. The end of Ghana Telecom and Westel's exclusivity encouraged both companies to roll out new lines, which made acquiring Internet access easier for ISPs and their customers. Finally, rapid growth in Internet use can also be attributed to a growth in purchasing power by Ghanaian consumers.

The major attack on the ISP industry over the issue of VOIP drove ISPs into a coalition. It took almost three years for operators to build mutual trust. As a result of this new spirit of trust, a consensus emerged on the need for an Internet exchange point. Once GISPA was formed, other stakeholders—namely the government and the NCA—saw that they would now have to deal with a corporate body. The ISP industry had gained a better image and bargaining positioning.

The difficulties of achieving universal access have also affected Internet diffusion. Lack of local telephone loops in much of the country has limited the spread of ISPs and their ability to connect rural areas. Some ISPs even have trouble acquiring phone lines for their POPs in regional capitals. Ghana Telecom's new management has pledged to provide telephone and Internet access

to all communities that have a secondary school. In order to fund universal access, Ghana Telecom insists that its international calling revenues must be protected against competition from ISPs. There is an Ashanti saying: "If I cannot get ahead, I will not let you get ahead." This saying is often represented by the image of a two-headed alligator, with both heads pulling in an opposite direction. Such lack of trust has prevented the establishment of an Internet exchange and a national backbone. The ISP industry in Ghana has been able to develop thanks to the decentralized nature of the Internet. Despite conflicts among ISPs, between ISPs and Ghana Telecom, and within the government, the Internet has indeed made remarkable progress.

Over the years, the negotiation of CNIs has evolved. Today, the various stakeholders prefer to discuss issues openly rather than resorting to other means. Some discussions do not lead to consensus, but the process of negotiating must be applauded. In the late 1990s and early 2000s, few negotiations were held. Ghana Telecom's plan to enter the ISP market, for example, prompted several discussions mediated by the Ministry of Communications and the NCA. However, there is still a need for more interaction, inclusion, and consensus building, so that issues may be seen in the broader context of the entire industry.

If further development of the Internet is to take place in Ghana, an open communication policy must be created. Such an environment would encourage more inclusion and interaction among stakeholders, as well as facilitate the signing of interconnection agreements between various kinds of networks. Clearly, the CNIs discussed in this chapter demonstrate that the enforcement of interconnection agreements is critical. It is essential for the NCA to establish a process under which ISPs can sign interconnection agreements with Ghana Telecom and other operators (such as mobile companies). The VOIP issue demonstrates that the ISPs that used Ghana Telecom to terminate VOIP calls should have been required to have an interconnection agreement with the telecom. In 2001 the Ghanaian courts rightly declared that no rules or regulations existed that made what the ISPs were doing illegal. The only violation found by the courts was that the ISP licenses were for "data" rather than "voice" traffic, a distinction that is tremendously difficult to make, since voice traffic is in fact data traffic.

The NCA needs to help establish an interconnection regimen between Ghana Telecom and ISPs that stipulates what settlements are due when either party uses the network of the other to terminate calls. In addition, the NCA needs a framework to enforce such interconnection agreements. Although Ghana Telecom is required to interconnect with the mobile operators, it has not allocated enough bandwidth for this purpose; as a result, many calls between Ghana Telecom and the mobile operators are dropped.

A convergence is occurring between ISPs and mobile operators. Users can now send e-mail messages to mobile handsets equipped with a short messaging

system (SMS). It is only a matter of time before mobile users will be able to send e-mail or voice-mail to personal computers via the Internet. Ghana Telecom and mobile networks should not be allowed to impede convergence by refusing to negotiate interconnecting agreements with ISPs.

Developing and implementing market-based interconnection agreements that facilitate convergence will require an open policy environment. To achieve such an environment, the NCA must develop regulations that are farsighted and allow technology to evolve. It is clear from the CNIs discussed in this chapter that regulatory uncertainty and biased interpretations of existing regulations have hampered Internet growth. It is also certain that the lack of a definite communications policy has caused many problems for the telecommunications industry. In most developing countries like Ghana, restrictive laws and an untrustworthy regulatory process thwart the ability of local entrepreneurs and outside investors alike to supply the markets with new technologies that contribute to building the communications infrastructure.

In many developing countries, governments restrain or prohibit new information and communications technologies (e.g., VOIP), restrict unlicensed wireless fidelity (WiFi) and other wireless standards, impose crippling ISP licensing requirements, and limit access to fiber optic cable connectivity. Often, such restrictive policies derive from the government's close (and often corrupt) relationship with traditional, state-owned monopoly telecoms.

Elimination of existing (and emerging) legal and regulatory obstacles to deployment of an open communications network could significantly boost private sector investment and Internet growth in Ghana. This is not simply a choice between old-fashioned telephony and newfangled Internet technologies—it is a choice between two ways of structuring government and society. The old telephone network model is closed, centralized, controlled, and top-down; the new paradigm, like the Internet itself, is open, decentralized, competitive, and technology-neutral. If growth of the Internet in Ghana is to be fostered, then a truly forward-looking set of laws, policies, and regulations is needed. Communications networks and information technologies will thrive under an open communications initiative.