

Africa's telecommunications giant awakes

Patience Akpan-Obong and William A. Foster provide an overview of Africa's most vibrant telecommunications market.

In 2001 there were 0.43 main telephone lines for every 100 inhabitants in Nigeria, with a total (analogue) cellular phone subscriber base of 330,000 (or 0.28 per 100 inhabitants). By August 2006, there were more than 1.5 million connected fixed lines and almost 27 million cellular phone lines in the country, raising the teledensity to 23.29 in a five-year period, according to the Nigerian Communication Commission. The mobile phone subscriber base in Nigeria had hit 30 million by the end of 2006. Dr Emmanuel Ekuwem, chairman of the Association of Telecommunication Companies of Nigeria, describes the explosion of cell phone usage in Nigeria as a revolution: "(Previously a customer) applied for 090 (the prefix of the former analogue cell phone numbers) and waited for two years without service. Now all he has to do is walk into a service centre and in less than ten minutes have an activated line. From two years (at about N100, 000) to ten minutes (at about N6, 000), that is a revolution, quantum leap and phenomenal."

The deepening of Nigeria's telephone penetration can be attributed to various factors. However, the specific success of the deployment of digital mobile telephony in the country is a triumph of the unique strategy adopted by the national regulator, the Nigerian Communications Commission (NCC). The Commission, enabled by the National Policy on Telecommunications (NPT) simultaneously opened up the telecommunications sector to competition while also holding a tight rein over the process. For instance, it licensed private-sector interests to provide digital mobile services, but protected the industry by restricting the number of digital mobile licences (DMLs) in the first five years. It also set clear parameters of operations such that the local service providers (those offering fixed and wireless fixed lines) could not offer digital mobile phone services. The Commission also allowed an overt investor-oriented tariff structure ostensibly to raise the profit levels and potentials of investing in the industry. This rewarded existing investors while encouraging others to invest in the industry. The high tariffs were protested by customers at every stage, leading to an upsurge in consumer rights groups. Paradoxically, the high tariff structure (and therefore high profits) facilitated the rapid rise of the industry as operators invested more in infrastructure development and expansion of customer base.

The developments in Nigeria's telecom sector in the years between 2001 and 2006 have indeed been both phenomenal and revolutionary, given the state of the landscape only a few years back.

A brief history with rapid change

Until the mid-1980s, there were only 200,000 functional telephone lines in Nigeria, the most populous African nation, now of approximately 140 million people. The capacity of the country's national telecommunication carrier was 460,000 lines, operating on analogue exchanges. There was a significant change in 1985 following the break up of the colonial Post and Telecommunication (P&T), a unit of the Ministry of Communications, into two distinct government agencies. The Nigerian Postal Service (Nipost) was created out of the postal division of P&T to handle postal communications while the telecommunications division was merged with the Nigerian External Telecommunications to become the country's national carrier, the Nigerian Telecommunications Limited (Nitel).



The number of telephone lines in the country gradually rose to 400,000 lines by the end of the 1990s out of an installed public telephone network capacity of 700,000. Of the 400,000 lines, only about 60% were actually functioning.

The Nigerian Communications Commission (NCC) was inaugurated in July 1993 and given the task to:

- Create a regulatory environment for the supply of telecommunication services and facilities;
- Facilitate entry of private entrepreneurs into the market; and
- Promote fair competition and efficient market conduct among all players in the industry.

For the first time, there were private telecommunications operators (PTOs) competing with the national carrier, Nitel, with payphones in some cities such as Lagos that did not carry the Nitel logo. The PTOs provided local services but also had the capacity to interconnect with other regional providers. This led to an increase in teledensity in places such as Lagos where several of these providers had found fertile soil, especially in the new development areas not reached by Nitel. Many of these companies, to overcome the infrastructural constraints, provided their services through Wireless Local Loop (WLL), using radio waves for transmission. The chief executive officer of the NCC, Ernest Ndukwe, says that on the basis of the Commission's mandate to liberalize the telecommunications industry, it had accomplished a lot since its creation. And most operators, consumers and analysts would agree.

However the Commission's major task was to set in motion the process that resulted in the formulation of the National Policy on Telecommunications (NPT) aimed at helping the country to "achieve a modernization and rapid expansion of the telecommunication networks and services to enhance national economic and social development (and as) a major means of integrating Nigeria into the globalized telecommunication environment." The first step toward the achievement of the NPT objectives was the development of the mobile telephony sector. The process was politically intense and took almost a year, but eventually GSM licences were auctioned and issued to four providers including Nitel.

A clear policy on telecommunications was the engine that propelled developments in Nigeria's telecommunications industry. The nature of the drivers was equally crucial. During the debates leading to the formulation of the NPT, stakeholders in the private sector had strongly argued for the involvement of the private sector in the industry. Many commentators in the media repeatedly said "government had no business providing phone services." They cited the problems with public utility services in Nigeria which had always been blamed on the direct involvement of the government. Currently the power generation and distribution, and production and supply of petroleum products in the country suffer from this direct involvement of the government. Titi Omo-Etu, one of the country's leading telecommunications engineers, argued back then and still does: "It is wrong for the government to run (public utilities). For instance, to use ICTs for development, the government should provide enabling environment for private sector to thrive through regulation, fairness, protect investments, and (ensure that) laws are obeyed and complied with. Government should try to help the service providers by providing market for them by patronizing these businesses."

Policy-makers listened and adopted a private sector-driven approach for the telecommunications industry. This created the environment for the mobile telephone industry to take off and flourish the way it has. While customers protested against the investor-bias, they used the long overdue services in ever increasing numbers despite the numerous problems. In fact, the service weaknesses resulted in increased business for the operators. For

instance, to overcome the poor interconnectivity between the four networks, many users acquire as many as four mobile phone lines subscribed to the different networks. Thus to dial a number with a 0803 prefix, a user will use his/her phone that has the MTN SIM card. (0802, 0808 are Celtel, 0805 is Glo and 0804 is Nitel). It is therefore common to see Nigerians with four different cell phones and each having different identifying ring tones.

The Umbrella People fill the gap

This multiple subscription is not acknowledged in reports of cell phone subscriber base in the country. But this duplication of numbers is probably compensated for by the ubiquity of "umbrella people". Even with 30 million subscribers, that still leaves about 110 million Nigerians without direct access. And this is where the "umbrella people" provide a key service to fill in the gap.

These are men and women (and increasingly women) who sit under large umbrellas that display the logos and advertisements of the digital mobile phone providers and who retail phone services. They sell the recharge cards to users as well as act as pay phones. The more sophisticated umbrella people do basic trouble-shooting on users' phone hand sets. But mostly, they display their fixed wireless phones (by those operating in Lagos) and cell phones waiting for customers to make calls at the rate of N20 to N30 per minute. This rate is lower than the official cell phone voice call cost because of the wholesale rates they get from the telephone companies as a result of the volume of their transactions. Many umbrella people have "adjusted" the clocks in their phones so that one minute is actually several seconds less. Also, while the phone companies charge by the second, the umbrella people round up their rates to the nearest minute. But for people who just need to make a quick phone call, the umbrella people provide a useful service and few users are likely to complain about paying a little more provided their calls are successfully completed. And these services increase the national total of the populace with access to telephony.

Problems in the Telecom industry

Service problems: While the Nigerian telecommunications landscape has changed dramatically in the last seven years, many problems remain. For instance, both service providers and users complain of the infrastructural constraints that add to the overhead costs resulting in high tariffs. Users complain of congested networks, inadequate regional coverage and poor signals, especially outside the big cities. It is quite a sight watching people in the rural areas manoeuvre their bodies to get signals. It is not unusual for people to climb trees, raise their phones in this or that direction just to see the "mighty bars" light up. Some networks are better than others in many rural areas. This drives users, at least those who can afford it, into subscriptions with multiple networks as the best way to guarantee that their calls get through regardless of their geographic location.

High call tariffs: The cost of telecommunication services has dropped drastically for users since 2001. At the roll-out of the GSM services in August 2001, the cheapest package was N30,000 (about US\$250). This included a cell phone and charger, a SIM and a number. As at January 2007, one could get a cell phone, SIM and number for about N5,000 in Lagos (about US\$40). The cost of an individual SIM card is fairly standard at between N300 and N400.

The cost of phone calls in the country remains relatively higher than elsewhere, with the rates ranging from N35 to N50 per minute (average of 40 UScents). Many users can barely afford to "load up" their phones (buy the recharge cards) and maintain the barest minimum to keep their numbers active. The exclusivity clause and the overt protection of providers in the first five years of the deregulation resulted in an inflexibility in the tariff structure.



It is expected that some of these problems will be reduced if not entirely resolved in the new phase of the developments in the telecommunication sector in the country. The major features of this second phase are the end of the exclusivity for the original four digital mobile service providers and the entry of additional eight providers into the sub-sector through the unified licensing regime. Also, the active construction of a second national backbone by the second national carrier is expected to reduce some of the infrastructural constraints and create a more functioning telecommunications system.

Unified licence – The Holy Grail of telecommunications?

During the initial licensing of operators for cell phone services in Nigeria, the emphasis was on digital mobile licences (DMLs). Titi Omo-Ettu says the mistake was specifying what services the operators could provide. "Ideally, we should have said we were giving licences for telephone services. The operators would then decide what kinds of services to offer. When we said DML we already constrained them on the kinds of services."

In emphasizing digital mobile services, the NCC differentiated between the mobile providers and the companies providing fixed services and fixed wireless services, many of whom are operating in a few major cities in the country. The PTOs were restricted to providing regional services. The national regulator was deliberately protecting the digital mobile service providers by restricting the number of operators to four. This provided "an environment for them to catch a good chunk of the market unchallenged." This allowed them to stabilize without dissipating their investments.

During the five years, several PTOs entered the market using CDMA technology to provide digital wireless services. Initially, it was agreed that these providers could use their technologies to offer digital mobile services but charge the lower fixed telephony rates. A few of the companies began to do so. However, many of the PTOs began to agitate to be allowed legally to do what their technologies already had the capacity to do, namely to provide full digital services in voice, data and video.

By the end of 2006, the debate on a unified license structure heightened as advances in technology made restrictions on type of service both redundant and difficult to implement. As

Ekuwem points out: "Everything is carried on broadband as data. Broadband doesn't differentiate between voice, data and video. There is a convergence of voice, data and video. Licenses that carry voice can carry video and data so it's not possible to restrict operators who can carry voice from carrying data only. This results in a painful attempt to regulate what you can't regulate. Unified licence gives you a one-stop shop centre. Unified is an omni-service licence and doesn't restrict the service. This aids and facilitates less cumbersome work of regulation. VoIP has really revolutionized this unified debate."

It also became clear that the "original four" providers had become well enough established to render the exclusivity clause unnecessary. The stage was thus set for the emergence of more digital mobile service providers in the country, even though "new" companies were not being licensed. According to the first of four main conditions, providers seeking the unified licences must:

- Already be operating.
- They must have been providing at least 20,000 lines;
- They must have paid their interconnectivity fees – must not be indebted to anybody;
- And they must demonstrate willingness to have a national spread.

The four original DMLs were conditional on the provision of at least five percent of services in the rural areas. The PTOs were not required to do this since they were mostly regional service providers, but in the new structure, they will be required to provide services in the rural areas.

In terms of the unified licence regime, at least 12 providers (eight joining the original four) will be delivering telecommunications services in the country using two major technologies, GSM and CDMA, both of which are capable of delivering voice, data and video signals. This is expected to increase the rate of telephone diffusion in the country even further. There are concerns that all 12 providers might concentrate their resources on the more lucrative mobile services rather than invest in the lower priced (but less profitable) fixed and fixed wireless services. The multiplicity of actors is also expected to increase competition, thereby reducing the cost of telephone access and usage for Nigerians. It is also hoped that the deployment of the different technologies will

reduce many service problems that users currently experience.

At the end of 2006, NCC granted a conditional unified licence to Mubadala of the United Arab Emirates, which paid \$400m for a broad spectrum licence in the 1800 and 900 MHz bands that will enable it to roll out bundled packages including fixed wireless services, mobile services, broadband data and multimedia and international gateway service.

In this next stage of the telecommunications development in the country, two major issues are also being considered. The first is interconnectivity and infrastructure sharing, and the second is the question of a national backbone for the country.

Interconnectivity and infrastructure sharing

Right from the beginning of the operation of the digital mobile services, the question was raised about why the four original providers, MTN, Intercellular, Econet and Nitel, were not sharing their infrastructure. It turned out that they were not legally allowed to share infrastructure and to associate because of concerns that they might collectively have too much power and therefore "gang up" against the public interest. The companies, on their own, acted in ways that constrained interconnectivity between them hence artificially creating many of the service problems that subscribers constantly experience. An interconnectivity agreement was a condition of the DMLs but some of the providers, especially Nitel, would arbitrarily disconnect other providers so that users couldn't initiate calls from one network to another.

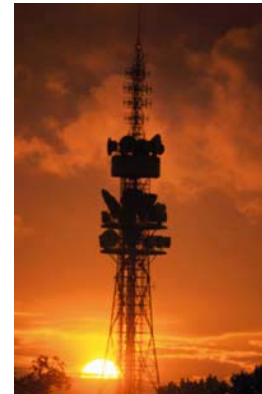
In this new phase of the telecommunications development, providers will be allowed to share infrastructure such as base stations, pipes, ducts and power to cut overhead costs. Already, the NCC has taken a step in this direction by issuing interconnect exchange licences to some operators to help in resolving the

challenges of interconnectivity in the industry. Medallion Communications has already established an exchange (see Box). While operators are now more able to work co-operatively with each other, NCC must be informed of what infrastructure is being shared and by whom, as the regulator wants to build anti-competitive forces in check. As Ndrukwe says: "The phone is connected to a base station – mast. On each mast an operator puts its dishes. Each operator builds its own masts. Often there are so many masts that would not be necessary if the masts were shared so that only the dishes by the different operators would be mounted. If cables are used, the pipe can be used by various operators."

The national backbone

There are currently two national carriers in the country, Nitel and Globacom. (Trans Corporation bought 75% of Nitel towards the end of 2006 and gave BT a management contract.) Nitel has a national backbone – a country-wide transmission network – while Globacom is in the process of building its own, though sections of it are already being used in different parts of the country.

These national carriers are also operators and therefore carry traffic as well as provide subscriber services. This distinguishes them from the other providers who are licensed to provide subscriber services but not to provide services to each other. Some companies in the country such as BCN are licensed to carry wholesale traffic – build the infrastructure and sell their services to providers without providing subscriber services. Nigeria can probably absorb more than two national backbones but the usual argument (mostly emerging from the exclusivity mindset of the first five years of telecom deregulation) is that the customer base is too small and diffuse to economically support several backbones. The NCC's strategy continues to mix deregulation and control. On the one hand, a private-sector driven model has



BT abandons sinking NITEL ship

British Telecom has pulled out of its technical services agreement with Transnational Corporation (Transcorp) for the management of NITEL and its mobile subsidiary, MTel. Transcorp, with BT as its technical partner, had acquired a 51 per cent stake in NITEL last year under the privatisation exercise managed by the Bureau of Public Enterprises.

In a letter to Transcorp, BT cited the unavailability of working capital needed to turn around NITEL and MTel, and the lack of adherence to corporate governance principles by the companies' management and their boards as the reason for its decision to withdraw from the agreement.

The decision by BT to terminate the technical services agreement it has with Transcorp could not have come at a worse time for the Nigerian conglomerate, said Nigerian newspaper *This Day*,

noting that it is yet to overcome the disappointing returns from its initial public offering (IPO). Capital market analysts estimate that Transcorp's IPO may have been undersubscribed by as much as 70%.

Steve Brookman and John Weir were seconded by BT as CEOs of NITEL and MTel respectively in November last year to oversee their day-to-day operations. Ms Funke Okpeke, meanwhile, was appointed by Transcorp as Chief Operating Officer (COO) of NITEL.

According to *This Day*, ever since Transcorp took over NITEL, and by extension its mobile subsidiary in November, the reconstituted boards of both companies have been enmeshed in internal wrangling among its members and disagreements with the British CEOs on how best to manage the companies. Specifically, John Weir, who was appointed CEO of MTel, has been at loggerheads with the company's chairman, Gboyege Olulade and other board members over the selection of equipment vendors for the company's network expansion programme.

Weir was said to have shown a preference for the appointment of Huawei and Motorola, while Olulade was pushing for Ericsson and other vendors. Weir also took umbrage over the appointment

of the new Chief Technical Officer (CTO), Davidson Anene, by Olulade without his input, and is said to have refused to recognise Anene as the company's CTO.

Things came to a head in April when MTel's board, comprising Transcorp members and Federal Government representatives, terminated Weir's appointment and gave BT four weeks within which it was expected to send his replacement. His dismissal did not sit well with BT, which was already disenchanted with Transcorp's inability to deliver on its promise to provide working capital for NITEL and MTel, said *This Day*, thus compelling it to pull out of the agreement in its entirety. Both companies are also riddled with massive debts owed banks, equipment suppliers and unsettled interconnect fees.

Possibly to counteract the negative publicity from the BT resignation, Transcorp announced it would invest N11.3bn (US\$90m) in MTel. Ladi Williams, acting CEO of MTel, said the investment would "revitalise and reposition" the company to ensure a quick return to the path of recovery for greater competitiveness in the mobile telecommunications market through "network restoration and network expansion in order to fast track the current effort to get MTel back on to a competitive strength." He announced that

Ericsson, Motorola, ZTE and Huawei will be awarded contracts worth an initial \$345m for network expansion. Another N7bn has been allocated for the network restoration project.

Williams said that with a population of 140 million, Nigeria could expand its mobile subscriber base from 38 million by another 30 million and MTel aimed to sign up five to six million of those.

In contrast, MTN Nigeria announced plans to spend US\$650m on network expansion aimed at providing the necessary infrastructure for 3G services and quality service. It said the network expansion would increase its base stations from 2,661 to 3,500 before the end of the year.

And Globacom announced in May that it had signed a contract with Alcatel-Lucent to install West Africa's first wireless network based on Universal Mobile Telecommunications Service/High Speed Packet Access (UMTS/HSPA) technology. Globacom recently paid \$150 million for its 3G licence. The other 3G licence winners were MTN Nigeria, Celtel and Alheri Engineering Ltd.

NITEL and MTel seem fated to fall further behind in this race for new territory in the continent's fastest growing telecommunications market.

exceeded the goals set out for the telecommunication industry in 2001. On the other hand, part of the success can be attributed to the direct involvement of the regulator in guiding developments in the industry.

National electricity crisis stunts future growth

The telecommunication landscape in Nigeria has changed phenomenally in the six years since the start of deregulation. The initial boost was the formulation of a national policy that deregulated the sector while partially directing developments in the industry. The partial direction was most evident in the licensing process for digital mobile services, as well as regulation of the industry even as the climate was created to protect providers investment through an uncontrolled tariff structure and exclusivity clause. The growth in the industry has not been without service problems and complaints about a tariff structure that many feel is too high.

The requirement that the Digital Mobile Licence (DML) holders provide widespread service has resulted in service in some rural areas. While rural dwellers still face problems of lack of electricity, cell phones have become integrated in rural life in many parts of the country, as the people find ways of keeping their cell phones charged, often going to nearby towns to pay a small fee to be allowed to plug in their phones into electrical outlets.

It is expected that the access and affordability of mobile tech-

nology will increase as the 12 providers compete to offer voice, data and video services to users in the country. Competition will therefore be essential to growth in services as well as lead to reduction in cost of phone access and services. The unified licences will create a convergence of services that will further drive competition in the new service areas.

Poor infrastructure such as electricity is likely to slow down growth in Nigeria's telecommunication industry. As efforts to develop the telecommunications industry increase, so should attention be paid to enabling technologies such as electricity. Telecommunications depends on primary technologies for sustained growth. Rural dwellers consisting of about 60% of the Nigerian population would be happier using a technology that does not require their having to travel kilometres to be able to charge up their hand sets. Also, the providers can deliver more services in the rural areas if they do not have to consider the additional overhead costs of providing their own electricity supply for their base stations.

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Medallion eases interconnect pains in Nigerian telecom industry

Operators in Nigeria are currently reaping the benefits of a seamless interconnect scheme established by Medallion Communications. Medallion is licensed by the Nigerian Communications Commission to offer interconnect and clearinghouse services to the telecom operators in Nigeria.

Before the advent of Medallion, the Nigerian telecom market was awash with a high interconnect debt rate as a result of disagreements on call detail records and an unwillingness on the part of operators to settle interconnect charges. The effect of this was reluctance to establish new interconnect links by the major operators and unilateral disconnections of debtor operators – with severe consequences on the quality of services for the subscribers. The peer-to-peer interconnect scheme being implemented by Medallion also implies a higher cost to operators in establishing interconnect to all their desired interconnect partners.

Medallion currently has 19 operators interconnected at its Victoria Island facility in Lagos. This includes the GSM operators like MTN, GLOBACOM, and CELTEL, as well as the CDMA and fixed-line operators. Using a switch that seamlessly interfaces IP/TDM, Medallion is able route calls amongst operators on an IP-to-IP, IP-to-TDM, and TDM-to-TDM basis. Medallion is currently the only facility in Nigeria where this is carried out, as all other interconnect points requires the conversion of IP protocols to SS7 by the operators before being delivered to the interconnect operator. Settlement of interconnect charges at Medallion has been prompt as reconciliation of call detail records (CDRs) are carried out on a daily basis – against the previous industry standard of monthly

CDRs reconciliation. Medallion also offers bank guarantees on calls to operators that are net receivers.

In addition to its interconnect clearinghouse service, Medallion offers co-location and data hosting services. Medallion was the implementation site for the Nigerian Internet Exchange.

Led by Engr. Ike Nnamani, Medallion intends to expand its service delivery to five additional cities in the coming months (Abuja, Ibadan, Onitsha, Port Harcourt and Kano), in fulfillment of the national coverage of its operating licence.



Left to Right: Peter Khan - Senior Engineer Syncra Communications, UK; Ikechukwu Nnamani - President, Medallion Communications Limited; Chijioke Iwunze - Project Manager, Medallion Communications Limited.

