

Harnessing Telecommunications Revolution in Nigeria: A Case Study

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Abstract In recent times telecommunication revolution especially the use of mobile phones is transforming the Nigeria society in many ways. The socio-economic and health impact are enormous. As the spectrum of mobile phone usage increases, opinions differ among users on the impact of this revolution in Nigeria. This paper therefore set to investigate the impact of cellular phone technology on health care services in Nigeria. In doing this, the study elicited data through questionnaires from 300 respondents who were randomly and positively selected. Findings show that Mobile phone communication offers an effective means of bringing good healthcare services to the citizenry. In general, the most important steps that different stakeholders can take to make the most of the Telecommunication revolution in Africa are also revealed.

Keywords: mobile phone, healthcare, telecommunication revolution

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1. Introduction

The mobile telecommunication industry has and is still undergoing extraordinary changes brought about by the introduction of new technology and market forces. Since the late 1990s countries in Africa, Asia and Latin America have been witnessing a phenomenal growth in the use of new information and communication technologies (ICTs), in particular mobile cellular phones [9] (see Figure 2). The coverage of the world's mobile networks is constantly increasing as more and more base stations are being

deployed. GSM/EDGE is one of the technologies that by far have the widest reach and today covers more than 85 percent of the world's population (see Figure 1). WCDMA/HSPA covered around 35 percent of the population by 2010 but is now accessible by over 40 percent of the world population. It has been estimated in [8] that mobile phones and personal computer systems (PCs) subscriptions will reach above 8 billion by 2016. By 2016 it is also estimated that 80 percent of the world's population will be able to access the internet using WCDMA/HSPA networks [8].

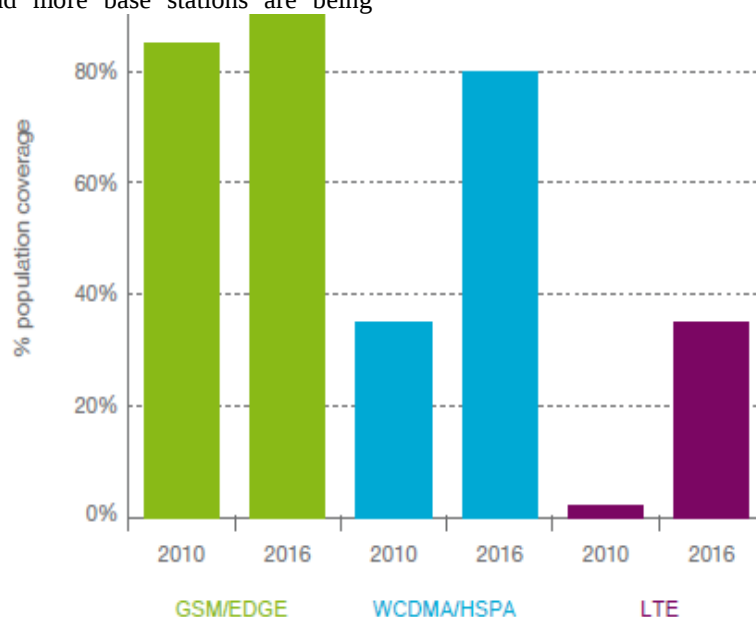


Figure 1. Projected 3GPP technology coverage, 2010-2016 [8]

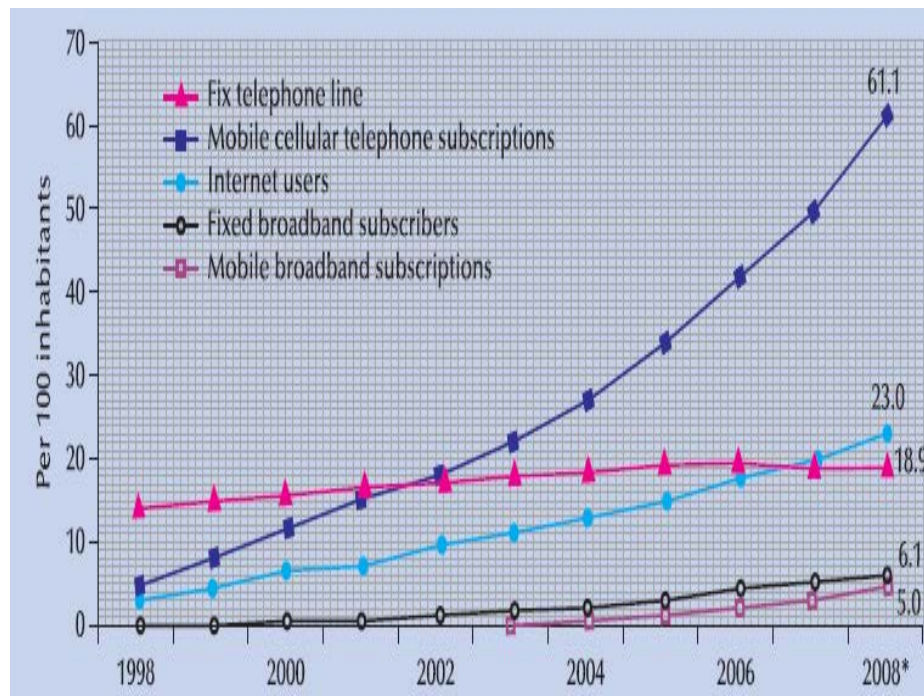


Figure 2. Global trend in ICT use [9]

According to Nelson Mandela, "Eliminating the distinction between information rich and information poor countries is critical to eliminating other inequalities between North and south and to improving quality of life of all humanity"[7]. Today, the operators and manufacturers of mobile telecommunication equipment are undertaking huge efforts to adapt the cellular networks to the new technologies, while aiming to maintain the level of service of the current networks.

There is a growing understanding among researchers that mobile-Phone Mediated Communication (MMC) has made it possible for people to chat, send and receive messages without having to meet face to face [1]. Mobile phone thus becomes a powerful instrument for making participation and advocacy within the society, advancing the socio-economic activities and health care services. It has provided the means to satisfy man's desire to reach beyond himself and commune with others, especially for special needs and emergency issues. Thus, the significant effort to figure out the implication of the cellular technology mobile phone usage on human health is not surprise, nor the interest of authorities and the public in these issues.

2. Telecommunications Revolution: the Nigeria Experience

Telecommunications revolution is transforming the Nigeria society in divers' ways since the dawn of the new millennium. A breakthrough in telephone infrastructure emerged in January 2001 when the sector was totally liberalized with the licensing of MTN and ECONET, now Airtel (mobile phone Company). They injected over a million lines into Nigeria within a year. Also Globacom came into existence late this year. The Global System of Mobile Communication (GSM) is spreading in a highly competitive manner from state to state and city to-city. The introduction of ubiquitous mobile phones that serve

for chatting and text messaging is providing a major tool in this revolution. The emergence of the Global System Mobile (GSM) put into effective check the monopoly of the Nigerian Telecommunication Limited (NITEL) on telephones. The introduction of mobile phones provided the needed tools to bridge existing digital divide. While government deregulation and liberalization policies provide a conducive ground for the emergence of global system mobile network providers, it discouraged the monopoly hitherto enjoyed by the Nigeria Telecommunication Limited and thus encouraged a substantial private sector investment in the telecommunications industry. With this development mobile phones have spread to the villages and are providing vital communication link to the rural people.

Internet is another great achievement of telecommunication. Internet is one of the technologies available for global resources and information haring. Internet has become a common resource of the whole mankind, inquiring and sharing information become easier than ever. With Internet, geographical distance and state borders are eliminated. The Internet can be a powerful democratizing force, offering greater economic, political and social participation to communities that have traditionally been undeserved and helping developing nations meet pressing needs. It needs to ensure that everyone has a chance to share in the benefits of the Digital Age, information technology.

2.1. Telecommunication and Health Care Services in Nigeria

Delivering health care with mobile phone technology enables health care professionals and institutions to address the critical medical needs of people, especially those in remote locations and those that lack qualified medical personnel and services. The advent of GSM has greatly enhanced the exchange of information especially in Nigerian teaching hospitals.

The aim of this paper is to present the main findings of the study undertaken on the impact of the use of mobile phone technology on human health care services in suburban areas of Edo state, Nigeria. Though the great growth of the penetration of mobile phones in Nigeria has attracted the attention of the ICT community and numerous publications (e.g. [1,3,4]), nevertheless, publications about the application of mobile phones for health care services especially with focused in suburban areas of developing countries are stills rare. This paper focuses on this gap of the literature, using two Local Government Area head quarters-Ekpoma in Esan West and Irrua in Esan Central in Edo State and wider reflecting about the behavior of mobile phones in this specific context. A suburban area is chosen as a case study to reflect a population taken across urban and rural environment.

3. Methodological Approach and Measures

The research design used for this study was survey. Three hundred questionnaires were administered to respondents elucidate the use of cell phone on health issues, but only two hundred and ninety- one were returned and two hundred and eighty-four were found useful, while 7 were incomplete and voided. Data collected was analyzed using SPSS for MS Windows.

3.1. Research Findings and Discussion

Shown in Table 1 is a summary of the results of the survey of the mobile phone technology impact on care health care services in the study area.

Table 1. A summary of the results of the survey of the mobile phone technology impact on care health care services

S/N	The use of cell phone for medical services by respondents	Male	Female	Total
1	Receipt of public health alerts	172	112	284
2	Health monitoring	93	108	201
3	Medical reminder	64	81	145
4	To make contact with Doctors/Nurses	156	119	275
5	Call/text message for emergency services	128	149	277
6	Call/text message to friends and family relatives during emergency cases	193	89	282
7	To call Doctors and other health workers on-call	87	126	213
8	To monitor menstrual cycle	37	214	251
9	To access internet services for prescription and medication	26	09	35
10	To make contact on where a particular ailment can best be treated as well as the financial implication	81	74	155
11	To access financial help during health challenges	137	141	278
	Total	1174	1222	

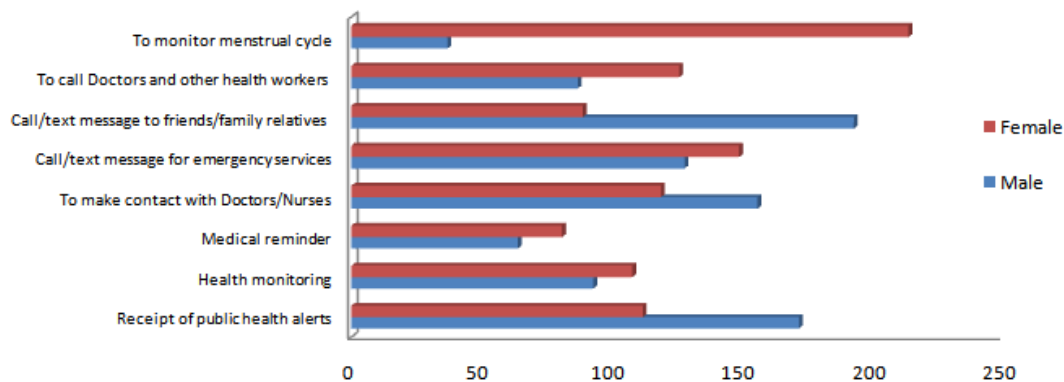


Figure 3(a). Male and Female respondents on the use of mobile phones for health care service

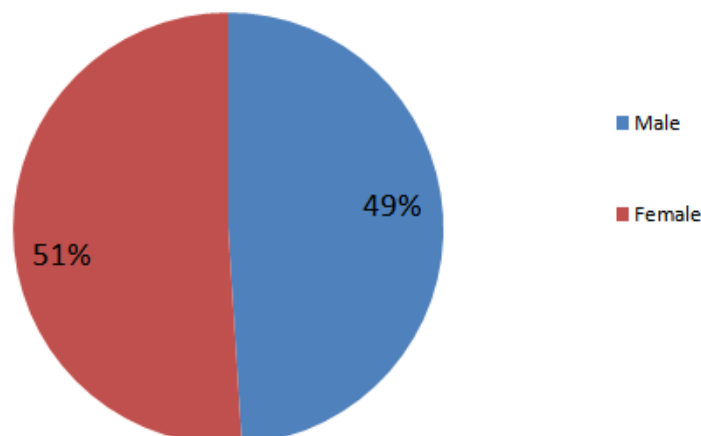


Figure 3(b). Male and Female respondents on the use of Mobile phones

The result of the field survey data in Table 1 is further explain statistically using histogram and the chart depicted in Figure 3(a) and (b) respectively. It can observed from this Figure 3 (a) that 17 percent use mobile phone to call/text message to friends and family relatives during emergency cases, 15 percent for medical services, 14 percent for making contact with Doctors/Nurses ,12 percent to access financial help during health challenges,11 percent to call/text message for emergency services, 9 percent for health monitoring, 8 percent to call Doctors and other health workers on-call , 6 percent to make contact on where a particular ailment can best be treated as well as the financial implication, 4 percent for medical reminder, 3 percent to monitor menstrual cycle and 1 percent to access internet services for prescription and medication .

Figure 3 (b) shows that the percentage for male and female correspondents that use the mobile phone for health issues are 51 and 49 respectively. This implies that there is a significant impact of mobile phone technology on health care services in Esan West and Esan Central Local Government Area of Edo State.

3.2. Recommendation

Given the large health care, socio-economic and societal payoffs from the widespread adoption and creative use of telecommunication services, there is a strong case for increased collaboration among developed and developing country governments, Telecom service providers, the private sector, philanthropists, and non-governmental organizations. Below are some of the most important steps that different stakeholders can take to make the most of the Telecommunication revolution:

3.2.1. Promote Private Sector Investment and Competition in Mobile Services

There are huge differences in the cost of mobile services among developing countries – as low as a penny per minute in India and 30 naira per minute in the Nigeria. Some of this is due to differences in the density of customers, since a higher population density allows a carrier to amortize its capital and operational expenditures needed to provide mobile service over a larger customer base. However, competition can play an important role in lowering prices and increasing private sector investment in expanded coverage and advanced services. Governments can increase competition by making spectrum available to multiple carriers, making it easier to obtain a license to operate, reducing barriers to foreign investment in the mobile sector, ensuring that universal service policies do not discriminate against mobile services by supporting only landlines, and safeguarding against anti-competitive behavior.

Developing country regulators should also be willing to support unlicensed services. For example, the University of California Berkeley computer scientist Eric Brewer has modified WiFi software so that this inexpensive technology can be used to support long-distance networks as opposed to local hotspots [7]. Regulators should take advantage of these and other innovative approaches to providing inexpensive rural connectivity and grassroots community networks.

3.2.2. Reduce or Eliminate Taxes that Disproportionately Target the Telecommunication Industry

Given the socio-economic and societal benefits associated with mobile services, there is a strong case to be made that governments should reduce or eliminate taxes that disproportionately target the mobile industry, such as special taxes on airtime, or high import duties on handsets and network equipment. In sub-Saharan Africa, eight governments levy luxury taxes on air time and governments levy luxury taxes on handsets [7]. The industry argues that luxury taxes are no longer appropriate given that a mobile phone is increasingly a necessity. An industry-sponsored study also concludes that because the demand for mobile services is so responsive to price reductions, governments could actually collect more tax revenue by eliminating mobile-specific taxes.

3.2.3. Increase the Capacity of Developing Countries to Create and Enable Applications that Address Their Own Needs

Mobile communications will have a greater societal impact if developing countries have more entrepreneurs, programmers, researchers, government agencies, and non-profit organizations that are capable of designing and implementing mobile applications that address local needs. Donors should provide additional funding to programs such as MIT's EPROM (Entrepreneurial Programming and Research on Mobiles). MIT researchers have developed a mobile phone programming curriculum that they have been teaching across computer science departments in East Africa. They also offer a "boot camp" that gives young African entrepreneurs the skills they need to design and launch new mobile services

3.2.4. Invest in the Global ICTD (Information and Communications Technologies for Development) Research Community

Many universities (e.g. University of California Berkeley, University of Washington, Carnegie Mellon University, the India Institutes of Technology) and companies (e.g. Microsoft Research India, IBM India Research Laboratory, and Nokia Research Africa) have teams of researchers that are committed to understanding and advancing the role that information and communications technologies can play in development. These groups can:

- Train the next generation of leaders in research, industry, civil society, and government.
- Rigorously evaluate the effectiveness of mobile solutions in areas such as health, poverty alleviation, education, and the delivery of government services.
- Develop new technologies, software tools and applications that address unmet needs.
- Promote interdisciplinary collaboration among researchers in fields such as computer science, the social sciences, business, education, and public health.

Donors, funding agencies, and companies should strengthen the field by supporting research, education and training for undergraduate and graduate students, "twinning" programs between developed and developing country universities, real-world demonstrations of prototypes, conferences, and peer-reviewed journals.

3.2.5. Fund Challenge Grants to Support Innovation in Telecommunication Services with Social Benefits

Challenge grants require companies to put up half or more of the funding would encourage more companies to pursue mobile services with broader societal payoffs, such as access for remote rural communities or applications related to health, education, agriculture, small businesses, and financial services for the poor. The grants could also encourage multi-sector partnerships among companies, universities, NGOs, and development agencies. An example of such a program is the Consultative Group to Assist the Poor, which is providing funding and technical assistance to banks and micro-finance institutions in developing countries.

3.2.6. Demonstrate Private Sector Leadership in Expanding Mobile Access and Its Economic and Societal Benefits

There is a great deal that industry (e.g. equipment manufacturers, handset manufacturers, operators, application developers) can do to maximize the health care and societal benefits associated with the Telecommunication revolution, including:

- Support continued innovation around low-cost equipment, handsets, and services, such as future versions of the GSM Association's "Emerging Markets" handset, or a base station developed by an Indian company that is less than one-tenth the cost of current equipment and uses the same amount of electricity as a light bulb.
- Create financial instruments that allow companies to invest in projects that have high health care payoffs but modest financial returns.
- Devote more people and resources to groups within the firm that can partner effectively with NGOs, social enterprises, universities, and development agencies. Examples of such efforts include Vodafone's collaboration with the UN Foundation and Qualcomm's "Wireless Reach" initiative.
- Pursue a business mission or concrete goal that speaks to the potential of mobile communications to improve the human condition. Mobile companies or Telecomm service providers could undoubtedly set and meet similarly ambitious goals.
- Embrace openness and interoperability so that it is easy for application developers to make their software and

content available to mobile subscribers across multiple networks.

4. Conclusion

The world is in the midst of a Telecommunication revolution. This study dealt with cellular mobile technology impacts on the personal health issues in Nigeria. Based on the results we can deduce that mobile phone technology has contributed to the positive growth of health care services in Nigerian. This implies that addressing future health needs in Nigeria will be facilitated by the development of mobile technologies and network expansion. A greater range of services becomes possible with more uniform, faster, and more affordable broadband access; greater access and coverage expands the 'subscriber' base, building volume, creating incentives for, and helping push sustainable Health applications beyond simple one-way data services.

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