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Effect of Global Systems of Mobile Technology (GSM) on Standard of Living of People: Evidence from Nigeria

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Abstract:
This study examines the effect of Global Systems of Mobile-Telecommunication (GSM) technology on subscribers' standard of living with empirical evidence from Nigeria. Survey design was adopted and data was collected through structured self-administered questionnaire designed on 5-point Likert scale. The main source of data was primary and the target population consisted of management staff of 12 selected firms in the south eastern states of Nigeria. A sample size of 381 was drawn from the study population of 47650 using Kothari approach. The single hypothesis formulated was tested with ordinary linear regression analysis at 0.05 level of significant. Based on the analyzed data, the study found that there is a positive significant effect of GSM technology on subscribers' standard of living. It is advised that Nigerian Government should provide adequate support and enabling environment for telecommunication firms to expand their operations and stimulate economic activities. The study further recommended that managers of telecommunication firms' should utilize more effective service strategy since it has been proven to have the highest significant impact on the people living standard.

Keywords: *GSM, Technology, Standard of Living, Economic Growth.*

1. INTRODUCTION

Development is very vital and essential to any society and the roles that telecommunication plays in the development of any economy cannot be overemphasized. As such, it is one important tool, alongside power as an indispensible tool in the entire process of globalization (Adebayo & Ekejiuba, 2016). It is widely accepted that telecommunication sector remains one of the strategic sector that aids the realization of the micro economic growth and development in most countries (Salisu & Ibrahim, 2014). Furthermore, the need to determine the relationship and impact of telecommunication on quality of service delivery and socio economic development of nations has been widely and largely debated (Suleimon, 2014). It is important to note that telecommunication is vital for economic growth and quality of life not because it enhances productivity of labour, capital and other factors of production, but the fact that increased energy consumption indicates the high socio-economic status of the nation's concern (Adebola, 2011; Sulaimon, 2014).

Telecommunication finds expression in digital technology and all its uses and variants, including the computer, the internet, mobile telephones, the different electronic applications, facilitate communication among humans (Ogidan, Adekola, Emmanuel & Oluwanishola, 2017). All these are supported by a variety of infrastructure of which key amongst is power. Access to modern energy is assumed to be a precondition for poverty alleviation, sustainable development and the attainment of the millennium development targets (Suleimon, 2014). An infrastructure service such as telecommunication is essential for socio-economic development. The quality of these services is also necessary for national development to take place. Major infrastructure

failures quickly and radically reduce communities' quality of life and productivity. Conversely, improving infrastructure services enhances welfare and fosters economic growth.

Nigerian Mobile Telecommunication is the fastest growing market in Africa. Nigeria, a developing country, in 1992 introduced its first mobile phone services, through the joint venture between Nigerian Telecommunications Limited (NITEL) and Domestic Substances List (DSL) of Canada to form Mobile Telecommunications Service (MTS) (Gerpott, Rams & Schindler, 2001). The regulatory body, Nigerian Communications Commission (NCC), modernized and expanded the mobile telecommunication network and services by granting GSM license to three (3) service providers namely: MTN Nigeria, ECONET Wireless (now AIRTEL), and the first national carrier, NITEL (initially MTS, privatized to form MTEL). In 2002, the second national carrier, GLOBACOM, was also granted license to commence operations. In 2007, ETISALAT acquired the unified access license from the federal government of Nigeria. Since the launching of GSM, the number of subscribers in Nigeria has greatly increased. Ndukwe (2005) reports that between 1998 and 2000, the number of mobile lines was 35,000, but grew to over 11million as of March 2005, with a growth rate of more than a million lines annually since 2002. This translated to an increase from the total density of 0.4 lines per 100 inhabitants in 1998 to 9.47 lines per 100 inhabitants currently. Additionally, the sector has attracted an investment of over US$8billion and has greatly increased the number of employed people directly (those working with the GSM companies) or indirectly (this includes various level of dealerships, cell phone vendors, repair shop, suppliers of accessories, fixed and mobile call shops and street recharge card hawkers). The number of the employed people is reported to be over 300,000 Nigerians in 2005 (Ndukwe, 2005). Other benefits include easy, affordable and quick access to phone by different categories of the population, reduced frequency of travelling, etc, and all these benefits contribute to the socio-economic development of the country.

In view of the perceived importance of GSM to poverty alleviation especially in Nigeria, spirited efforts are being made by government, service providers and other development agencies in providing access to GSM services to many rural communities in Nigeria. The results of these efforts in the last few years have ushered in tremendous growth in telephone ownership and use in some rural communities in Nigeria as many rural communities can now access four main service providers in Nigeria viz: MTN, Globacom and Airtel and 9mobile (formerly, Etisalat); thus bringing wireless communication to new groups of users, users who were earlier excluded from the telecommunication system. One important question is whether the growth in this sector had spurred better socio economic development and quality of service delivery. In other words, to what extent has these operating GSM companies affected the gross domestic product/standard of living in the North central Nigeria people; who are mainly agrarian in nature. It is important to note that the operating companies in the telecommunication and power sector still grapple with challenges ranging from inadequate funding to infrastructures alongside technological obsolescence. Has this challenge impacted on their ability to deliver quality service to the agrarian populace of North Central Nigerian? Or do these translate to affecting the standard of living of the people of North Central States of Nigeria? These are the major thrust of problem this study seeks to investigate by examining the effect of GSM technology on subscribers' standard of living. Hence, the study hypothesized that:

HA_1: GSM technology has a positive effect on subscribers' standard of living in Nigeria

2. LITERATURE REVIEW

Telecommunications in Nigeria

Mobile telecommunication is becoming one of the most important industries in the world. Although, perhaps, not the intent of introducing a new technology, the implementation of the GSM standard has directly and indirectly contributed to economic growth, led to the creation of new

employment opportunities and contributed significantly to the GDP of many countries (Wojuade, 2005). The development of GSM in the world was prompted by the need to provide seamless telecommunications through Europe (Ajiboye, Adu and Wojuade, 2007). In Nigeria, rural tele-density is quite low and this has been attributed to the scarcity of wireless communication infrastructure in most parts of rural Nigeria a scenario that has created the digital divide between the urban and rural areas in Nigeria (Coyle, 2005). This situation has demonstrated the need for extension of ICT infrastructure especially GSM to the Nigerian rural communities.

However, a critical review of literature reveals contrasting findings by scholars on the impact of mobile phones on rural livelihoods, employment creation opportunity and poverty reduction. Studies have shown that there is a positive relationship between telecommunication infrastructure development and economic growth. Among these studies are International Telecommunication Union (ITU) (2003), Sridhar and Sridhar (2003 and 2004) and Noll (2000). Also, Waverman, Leonard, Meloria and Melvyn. (2005); Information for Development Studies, (2006); Lusting and Stern, (2000); have separately shown that Information Communication Technologies (ICT) such as mobile phones can have an impact on rural livelihoods and thereby on poverty in rural communities in developing countries. However, Heeks (2005) maintains that the failure and massive underuse wireless communication cum GSM set up in rural communities have raised doubts over their relevance for rural poverty reduction and sustainability while the World Bank (2005) observe that making mobile phones availability in rural communities does not guarantee that poor people will and can use them to create and share knowledge that could help lift them out of poverty.

Between 1960 and 1985 the telecommunication sector consisted of the department of Post and Telecommunication (P&T) in charge of the internal network and a limited liability company, the Nigerian External Telecommunication (NET) limited, responsible for the external telecommunication provided the gateway to the outside world. The installed switching capacity at the end of 1985 was about 200,000 lines as against the planned target of about460,000. All the exchanges were analogue with 1 phone line to 440 inhabitants, well below the target of 1 phone line to100 inhabitants recommended by International Telecommunication Union (ITU) for developing countries. The quality of service was unsatisfactory. The phone was unreliable, congested, expensive and customer unfriendly.

Arising from the foregoing, in January 1985, the erstwhile Posts and Telecommunications department was split into Postal and Telecommunication divisions. The latter was merged with NET to form Nigeria Telecommunication Limited (NITEL), a limited liability company. The main objective of establishing NITEL was to harmonize the planning and co-ordination of the internal and external telecommunications services, rationalize investments in telecommunications development and provide accessible, efficient and affordable services. NITEL had roughly half a million lines available to over 100 million Nigerians after about 40 years. NITEL, the only national carrier as at then had a monopoly of the sector and was synonymous with epileptic services and bad management. On assumption of office on May 29, 1999, the President Olusegun Obasanjo administration swung into action to make it a reality the complete deregulation of the telecom sector, most especially the much touted granting of licences to GSM services providers and setting in motion the privatization of NITEL. This practical approach by the government to the telecom sector has made it possible for over 2.5million Nigerians in the year 2005 to clutch GSM phones today (Nigeria Business Information, 2005). In addition to this, Nigeria is Africa's largest mobile market with more than 125 Million subscribers and market penetration of around 75% in early 2014. The rapid growth has led to problems with network congestion and quality of service, prompting the regulatory authority NCC to impose fines and sanctions. Wireless Communication cum GSM mobile communication is one of the most explosive

developments ever to have taken place in the telecommunications industry (Wojuade, 2006).

Audile (2000) describe GSM as part of evolution of wireless mobile communication that includes high speed circuit, switched data, general packets radio system and universal mobile telecommunication service. The overall system definition for Wireless Communication describes not only the air interface but also the network. International Engineering Consortium (2005) conceives GSM as a globally accepted standard for wireless communication. To them, it is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specification for a Pan-European mobile cellular radio system operating at 900MHz.

Wojuade (2006) periscopes a number of things on the development of Wireless Communication GSM in Nigeria. He explains that GSM actually came as a result of the choice of the operating companies who bided for the mobile licenses. The operating companies quickly adopted GSM because of the obvious economic advantage. He concluded that since then GSM has spread even to the United States and such other places that traditionally did not have GSM at the beginning. And that it grew very fast and overtook fixed services within a short time and it is not just in Nigeria but all over the world.

As part of moving industry, telecommunication is expected to provide employment opportunities for the unemployed graduates and school leavers. The licensed operators in Nigeria such as mtn, airtel, glo, etisalat and the likes are still recruiting workers. It is against this background that the present study is designed to examine the impact of wireless system of global communication on the economic lives of the Nigerian rural users and as well consider its implication for the emerging communication industries.

Theoretical Anchors: Socio-Technical Systems Theory and Role Theory

This work anchored on Socio-Technical Systems Theory and Role Theory.

Socio-technical systems theory (Trist and Bamforth, 1951) also falls in this first category of job design approaches which specify workplace factors that enhance performance. Basically, socio technical systems theory describes work systems as composed of social and technical subsystems and suggests that performance improvement can only follow from the joint optimization of both subsystems. In more detail, socio technical systems theory suggests a number of job design principles such as the compatibility between the design process and its objectives, a minimal specification of tasks, methods, and task allocations, and the control of problems and unforeseen events as near as to their origins as possible (Clegg, 2000). Parker and Turner (1994) pointed out that socio-technical systems theory is more concerned with group performance than with individual performance. However, one can assume that work situations designed on the basis of this approach have also positive effects on individual performance**.**

Role theory focuses on factors that have a detrimental effect on performance. Within role theory, role ambiguity and role conflict are conceptualized as stressors that impede performance. However, empirical support for the assumed negative effects of role ambiguity and role conflict is weak (Jackson and Schuler, 1985). In a recent meta-analysis, Tubbs and Collins (2000) found a negative relationship between role ambiguity and performance in professional, technical, and managerial jobs. Additionally, they found a negative relationship between role ambiguity and self-ratings of performance. Similarly, neither Jackson nor Schuler (1985) nor Tubbs and Collins (2000) found a significant relationship between role conflict and job performance.

3. METHODOLOGY

This study adopted a survey research design. The choice of this method was based on the fact that the population and sample of this study are scattered in different states across the south eastern states of Nigeria which is study area. The data used for this research were obtained specifically from primary source which involved

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using questionnaire to obtain data for research variables. The population of the study consists of 47650 management staff of twelve purposevily selected firms in south east, Nigeria. A sample size of 381 was obtained using the formula given by Kothari (2008). Thereby, the total 381 questionnaires were distributed to employees of the 12 sampled firms in south east, Nigeria. The information gathered from the field was given and investigated with distinct measurements. The responses opinion and hypothesis were tried with mean, standard deviation and regression analysis was used to test the formulated hypothesis. The instrument was validated through content validity and Cronbach's method was used to determine the reliability. The justification for using this method and not any other methods like Test-retest, split-half methods is because of their inherent shortcomings which Cronbach's Alpha relieves. The result of reliability test shows a coefficient of Cronbach's Alpha of 0.769, indicating high reliability of the instrument.

Biography Info	Options	Freq	Percent
Sex	Male	177	52.1%
	Female	163	47.9%
	Total	**340**	**100%**
Age	Less than 18	75	22.1%
	18-35	187	55.0%
	35-50	46	13.5%
	50 and above	32	9.4%
	Total	**340**	**100%**
Marital Status	Married	133	39.1%
	Single	207	60.9%
	Divorced	0	0.0%
	Widowed	0	0.0%
	Total	**340**	**100%**
Educational Qualifications	SSCE	75	22.1%
	OND/NCE	187	55.0%
	HND/BSc	46	13.5%
	PG	32	9.4%
	Total	**340**	**100%**
Years in Using GSM	1-4years	24	7.1%
	5-8years	49	14.4%
	9-12years	167	49.1%
	13 and Above	100	29.4
	years	**340**	**100%**
	Total		

4. RESULTS AND FINDINGS

The presentation and interpretation of data were based on the data generated through the questionnaire administered to the sampled employees. A total of 381 copies of questionnaire were administered out of which 340 (89%) of the administered questionnaire were properly completed and returned. This makes (89%) response rate upon which the analysis of this study is based.

Table 1: Biographical data of the respondents

Source: Researcher Field Survey, 2019

Table 1 above shows the frequency distribution of respondents' demographic data. The distribution of gender reveals that male respondents were 177 (52.1%) and female respondents were 163 (47.9%). Despite the difference between the two genders, data obtained represents a rich and balanced opinion of both genders. This validates the even distribution of respondents based on gender. The age distribution revealed that 75 (22.1%) were respondents less than 18 years, 187 (55.0%) were respondents between ages 18 to 35 years, 46 (13.5%) were respondents between ages 35 to 50 years, 32 (9.4%) were respondents between ages 50 years and above.. The result indicates that most of the respondents were between the ages 18-35 years (187) representing 55.0% of the total number of respondents. However, respondents within the age bracket above 50 years were the minority. The distribution of marital status reveals that Married respondents were 133(39.1%) and single respondents were 207 (60.9%). 0 (0%) numbers of the respondents were separated while none were divorcee. The implication of this is that most of the respondents were still unmarried while the least were those that have divorced their spouses. The qualification distribution revealed that 75 (22.1%) were respondents with SSCE, 187 (55.0%) were respondents with ND/NCE 46 (13.5%) were respondents HND/BSc, 32 (9.4%) were respondents with PG qualifications. The distribution revealed that most of the respondents have used GSM between 9-12 years. The implication of this is that most of the respondent's long time experiences in using GSM services.

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Table 2: The effect of GSM technology on standard of living of the people of south eastern Nigeria

Questions	SA No. (%)	A No. (%)	U No. (%)	D No. (%)	SD No. (%)	Total	Mean	SD
Advent of GSM technology has helped enhanced business operations in south east Nigeria	101 (29.7%)	82 (24.1%)	11 (3.2%)	47 (13.8%)	99 (29.2%)	**340**	**3.13**	**1.05**
With GSM technology in Nigeria, quality of life is enhanced	81 (23.8%)	66 (19.4%)	91 (26.8%)	82 (24.1%)	20 (5.9%)	**340**	**3.02**	**1.09**
GSM technology facilitates easy access to communication in Nigeria	101 (29.7%)	152 (44.7%)	11 (3.2%)	36 (10.6%)	40 (11.8%)	**340**	**3.37**	**1.21**
GSM technology has improved the standard of living	77 (22.6%)	92 (27.1%)	43 (12.6%)	91 (26.8%)	37 (10.9%)	**340**	**3.12**	**1.11**

Source: Researcher Field Survey, 2019

As presented in Table 2, 101 (29.7%) respondents and 82 (24.1%) respondents strongly agreed and agreed respectively that advent of GSM technology has helped enhanced business operations in south eastern Nigeria, while 47 (13.8%) respondents and 99 (29.2%) respondents disagreed and strongly disagreed. A number of 11 (3.2%) were undecided. Having a mean response score of 3.13 ± 1.05, majority of the sampled respondents believed that advent of GSM technology has helped enhanced business operations in south eastern Nigeria. Eighty-one (23.8%) respondents strongly agreed that with GSM technology in Nigeria, quality of life is enhanced. 66 (19.4%) respondents agreed, 91 (26.8%) respondents did not have any opinion, 82(24.1%) respondents disagreed and 20 (5.9%) respondents strongly disagreed. With a mean response score of 3.02 ± 1.09, the respondents finalized that with GSM technology in Nigeria, quality of life is enhanced.

From the mean response score of 3.37 ± 1.21 and the responses of 101 (29.7%) respondents, 152 (44.4%) respondents, 11 (3.2%) respondents, 36 (10.6%) respondents and 40 (11.8%) respondents who strongly agreed, agreed, did not have any opinion, disagreed and strongly disagreed, the respondents disagreed that GSM technology facilitates easy access to communication in Nigeria. With 77 (27.6%) respondents strongly agreeing, 92 (27.1%) respondents agreeing, 43 (12.6%) respondents having no opinion, 91 (26.8%) respondents disagreeing and 37 (10.9%) respondents strongly disagreeing as well as a mean response score of 3.12 ± 1.11, the respondents agreed that GSM technology has improved the standard of living.

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The formulated hypothesis was tested using ordinary regression. Respondents' opinions in Table 2 were used to test the validity of the formulated hypothesis and this is restated below:

HA_1: GSM technology has significant effect on the standard of living of people in Nigeria.

Regression model: $Y= \alpha = \beta X+ \mu$…. (For all observations i, = 1, 2 …n)

Where Y = standard of living

X = GSM technology

μ = error term of random variable

α = a constant amount

β = effect of X hypothesized to be positive

Hence, the regression (predict) equation will be Y = 103.443+1.771X

Table.3a:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.729[a]	.788	.913	27.22312

a. Predictors: (Constant), GSM technology

Table 3b:ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22223.044	1	22223.044	14.177	.004[a]
	Residual	2500.076	339	1567.539		
	Total	27223.12	340			

a. Predictors: (Constant), GSM technology

b. Dependent Variable: standard of living

Table 3c: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1(Constant)	103.443	47.849		2.991	.055
GSM technology	1.771	.416	.878	2.985	.004

a. Dependent Variable: standard of living

Table 3c: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1(Constant)	103.443	47.849		2.991	.055
GSM technology	1.771	.416	.878	2.985	.004

a. Dependent Variable: standard of living

Having analyzed the data from the questionnaire using regression analysis to evaluate GSM technology have significant effect on the standard of living of people in south eastern, Nigeria, the Tables 4.3.3 a, b & c revealed that the regression result shows the existence of significant result on the variables (R^2calc = .788, F = 14.177> at p< 0.05). The significant level was found to be 0.04, and due to this we reject the null hypothesis and accept the alternate one which states GSM technology has a significant effect on the standard of living of people in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

Telecommunication is an important sector for improving sustainable business growth and socio-economic development of any nations. Research does suggest that a telecommunications is more likely to generate higher economic growth in a country where they are adequately managed. Overall, there is a significant relationship between telecommunication and growth of the economy. This study indicates that the benefits of telecommunication are not only mixed but are also dependent on a lot of variables. These variables such as general economic stability, rule of law, competition and strong regulatory regime are some of the conditions for sustainable benefits from it. The study concluded that telecommunications provides better and more socio-economic benefits to Nigerian. The fundamental challenge of telecom sector is that its need to be more developed with very competent and accountable governments, and some strong economic and political institutions.

The effect of telecom on socio-economic growth was also tested and the results presented. Results of the study showed a moderate and positive

relationship. The findings were sufficient to support influence of telecommunication, implying that GSM operations, service delivery etc had statistically significant effects on standard of living of people. The finding that telecom operations have a statistically significant influence on economic growth is critical and telecom firms need to pay attention to their operations especially during downturn periods. The study further recommends that Nigeria Government should provide adequate support and enabling environment for telecommunication firms to expand their operations and stimulate economic activities. These would continue to enable them provide improved gross domestic product to the Nigerian economy. In regard to this the telecommunication firm should also improved their service delivery and effectiveness so as to continue in enjoying government enabling rules, policies and legislation. Similarly, based on the finding of this study, telecommunication firms' managers should utilize much of effective service strategy since it has been proven to have the highest significant effect on the people living standard and this influence the economic growth of nation. Government also need to further look deeper into how to make uniqueness less costly the operations of the telecom firms in order to make continue staying in business and to keep operating in the sector.

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