A Comparative Study on the Rates of Data and Call Services Usage in Mobile Networks in Nigeria

Uesoo Faith Emmanuel, Igulu Kingsley Theophilus, Johnson Barimlemena Dandy

Abstract— The Rates of mobile data service usage and mobile call service usage in Nigeria, Adopting a cross-sectional survey design, a random sampling technique was used to enrol 101 young and adult aged 15-30 years and above from the citizens residing and visiting the capital city of Owerri into the study, of different academic attainments Structured questionnaires were used for data collection, recorded significant facts in relation to customers interest in use of these services. The hypothesis testing result of regression analysis using SPSS, a statistical software window version 17.0 to analysed and compare the effectiveness of Age, Finance, Education and Time spend as independent variables against the dependent variables separately confirmed that Age alone has significant effect on mobile data service usage of 0.000 significant and all the independent variables are effective combined with significant level of 0.000 less than 0.05, while all independent variables has a significant effect on mobile call service usage in Nigeria with significant levels less than 0.05 that is (0.000, 0.018, 0.002, 0.001 less than 0.05 on mobile call services usage in Nigeria respectively. 80.20% of respondents preferred mobile data service to 19.80% of the research population that preferred mobile call service. 97 (96.04%) respondents used mobile phone browsing most over 4 (3.96%) respondents using mobile phone calling most. Mobile call service was recorded as the most expensive mobile service from the responses of 52.48% of the research population in term of mobile communication. Customers interest being driven by Internet and networks access, 90.10% of the total respondents uses browsing enabled phones while 9.90% of the population uses traditional mobile phone for call making with most entertaining interest in browsing phones.

Index Terms— Mobile Stations, Traditional Call Phone, Data Service-Enabled Phone, Internet Access, Mobile Services, Data Rates and Mobile Valued Added Services

———————————— ————————————

- **INTRODUCTION**

I

n recent time, mobile phone has become the bed rock solution to traditional telephone system that existed before now. This system has always been the only telecommunication solution in the century before the invention and advancement of mobile technology. Mobile phones became popular in Nigeria since 2002 and since then the rate of growth of access has been fast. This huge growth is also recorded in many other African countries . The use of mobile phones can enhance social economic and political growth as it enhances communication, which is the heart of any society. Communication with others allows the sharing of knowledge, goods and to express reflection and emotion . Mobile phone is one of the major forms of ICT in use, and integration of ICT generally into education can lower the cost of education, augment quality and provide a model for sharing ideas, experiences and knowledge of teachers and students. It has been found that given the right conditions, mobile technologies can significantly enhance teacher, professional learning and practice .

- *Uesoo Emmanuel Faith is currently pursuing a Master degree in Computer Science University of Port Harcourt, Rivers state , Nigeria, +2348064086913, menezordsecond4faith@gmail.com*
- *Igulu Kingsley, Computer Science dept. KENPOLY, Bori, R/stae, NIg.*

- *Johnson Dandy B. is currently pursuing a Master degree in Computer Science University of Port Harcourt, Nigeria, +2347038394609, dandy4god@yahoo.com*

-

1.1 Background of Study

The use of mobile services in Nigeria increases steadily as the numbers of mobile subscribers to different mobile service operators are increasing.

———————————————

Nigeria as one of the third world nation hoping for future development and general economic development, Documentations of facts and measurement of improvement in the different sectors of the economy are very important, as it would measure the extends of development among states of the nation. In the area of telecommunication, Nigeria penetrates into the Internet with mostly mobile devices similar to other nations of the world. The large number of Internet users gained access through different mobile devices. In light of these, the primary function of cell phone (voice call) that was design for telecommunicating mobile stations and gear connection among other stations with the aid of cellular network technology (GSM) of several base stations is amazing to know that it has been second place in the mobile technology. These facts prompt the thought to imagine if other activities and functions occupy the machine apart from the traditional voice calling function of these mobile machines as its most intended function. Of course, the value-added services to the mobile telecommunication technology, such as SMS, internet access, mobile applications, internet calls with complexity and self-entertaining features diverted the traditional use of mobile station of phone calling to function more than this grand service provided by cellular Networks Operators. In cause of these divergent interest and changes, this project work is compelled to compare and study the rates at which data service is used by cellular phone subscribers compare to the traditional phone calling (voice call). Also there is need to obtain and realise statistical data that will aid reference and records for proper planning and decision on which service(s) that need (s) more resources.

1.2 Research Questions

This study focuses on the two main services provided by mobile operators for subscribers. These services are the data service (mobile internet service) and call service excluding internet calls. The research answers the following questions:

- What is the effect of Age on the usage of these mobile services?

- What is the effect of Cost on the usage of these mobile services

- What is the effect of Education on the usage of these mobile services?

- What is the effect of Time/duration on the usage of these mobile services?

1.3 Research Hypotheses

In order to achieve the above specific objectives and realize the research aim the following hypotheses were formulated and tested in this research work, Where Ho and H_A represents the Null and Alternate Hypothesis for the variables within this study.

Hypothesis (1) for mobile Data service

- **(H_O):** There is no significant relationship between mobile data service and Age.

  (H_A): There is significant relationship between mobile data service and Age

- **(Ho):** There is no significant relationship between mobile data service and Finance.

  (H_A): There is significant relationship between mobile data service and Finance

- **(Ho):** There is no significant relationship between mobile data service and Education

(H$_A$): There is significant relationship between mobile data service and Education

- **(Ho):** There is no significant relationship between mobile data service and Time spents.

    (H$_A$): There is significant relationship between mobile data service and Time spent

Hypothesis (2) for Mobile call service

- **(H$_O$):** There is no significant relationship between mobile call service and Age.

    (H$_A$): There is significant relationship between mobile call service and Age

- **(Ho):** There is no significant relationship between mobile call service and Finance.

    (H$_A$): There is significant relationship between mobile call service and Finance

- **(Ho):**There is no significant relationship between mobile call service and Education

    (H$_A$): There is significant relationship between mobile call service and Education

- **(Ho):** There is no significant relationship between mobile call service and Time spent.

    (H$_A$): There is significant relationship between mobile call service and Time spent

-
- ## LITERATURE REVIEW

2.1 Historical Background of Mobile services in Nigeria

The Nigerian mobile services market has increased at a rapid pace, from 422,000 subscriptions at the introduction of GSM networks in 2001 to 73m at the end of 2009. Measured in terms of the mobile penetration, growth has been equally exponential, from just 0.33% of the population in 2001 to 48.9% in 2009 . Intense competition, the proliferation of prepaid plans, low-cost handsets and the rapid expansion of mobile networks to different parts of the country are the main drivers of growth in mobile subscriptions. The expansion of coverage to underserved areas by the smaller CDMA operators has also led to increased competition, bringing overall communication prices down . Since the inception of GSM technology in Nigeria, prepaid mobile services have been the most popular. Over the past eight years, prepaid subscriptions accounted for an average of 99.6% of total subscriptions, but the ratio fell to 99.1% in 2009. Subscriptions are wholly operator-based, since there are no mobile virtual network operators (MVNOs) in Nigeria .

2.2 Theories and Concepts on GSM Services

Mobile Stations: Mobile stations are called mobile phones in common linked with cellular stations that form a complete mobile network (also known as a cellular phone, cell phone, and a handheld phone) is a device that can make and receive telephone calls over a radio link while moving around a wide geographic area. **Traditional Call Phone:** This is refers to mobile phone that is capable of making and receiving radio signal as calls. This type of mobile is not internet enable. Is used primarily for call making and probably provide short message service. It will be used in this research report to identify mobile phone that is not browsing enable. **Data Service-Enabled Phone:** This is a multimedia mobile phone capable of accessing the internet as additional functionality compare to the traditional call phone. This type of mobile machine is capable of making and receiving radio signals from cellular base stations with it browsing capability. This name will identify mobile phone that is internet enable in this research report. **Internet Access:** Is the means by which individual terminals, computers, mobile devices, and local area networks are connected to the global Internet. **Mobile Services:** Global System for Mobile Communications (GSM) services are standard collections of applications and features available to mobile phone subscribers all over the world. **Data Rates:** Data rate is a technical term that describes how quickly information can be exchanged between electronic devices. In many cases, this term is used to describe Internet connection speeds and how quickly a consumer can upload or download files. **Voice Calls Service; Outgoing:** Once a mobile phone has successfully attached to a GSM network as described above, calls may be made from the phone to any other phone on the global Public

Switched Telephone Network . **Incoming Calls:** When someone places a call to a <u>mobile phone</u>, they dial the <u>telephone number</u> (also called a <u>MSISDN</u>) associated with the phone user and the call is routed to the <u>mobile phone operator</u>'s Gateway Mobile Switching Centre. The <u>Gateway MSC</u>, as the name suggests, acts as the "entrance" from exterior portions of the <u>Public Switched Telephone Network</u> onto the provider's network. **Routing the Call:** When the HLR receives this query message, it determines whether the call should be routed to another number (called divert), or if it is to be routed directly to the mobile. **Locating and Ringing the Phone:** When the call arrives at the Visiting MSC, the MSRN is used to determine which of the phones in this area is being called, that is the MSRN maps back to the SIM of the original phone number dialled. The MSC <u>pages</u> all the <u>mobile phone masts</u> in the area in order to inform the phone that there is an incoming call for it. If the subscriber answers, a speech path is created through the Visiting MSC and Gateway MSC back to the network of the person making the call, and a normal <u>telephone</u> call follows. **Mobile Valued Added Services:** These are mobile services added apart from the basic service of phone calling. Such services are the internet browsing technologies (2G, 3G and 4G and others) and some other multimedia capabilities.

2.3 Contributions of Related Works and Research Gap

Mobile phones in Higher Education Institutions; A case study of a Nigeria university, studied by Francisca Aladejana (2010), Institute of Education, faculty of Education, Obafemi Awolowo University, Ile-Ife, Nigeria. The research was predominantly carryout among 413 undergraduate students of Obafemi Awolowo University, Ile-Ife by stratified random sampling among course and faculty student. The research revealed that 100% of students have access to the use of mobile phones. This research work done by Francisca Aladejana (2010) of Obafemi Awolowo University, Ile-Ife, revealed that 98.78% uses mobile phones for contacting parents, relatives, and loved ones, 84.75% uses it to receive money from home via recharge cards, 12.11% for browsing, checking, and sending of emails, 53.69% and 29.06% uses mobile phones for text messaging and liaise with lecturers or project supervisors .

Customers' behavioural intentions to the use of mobile service was studied in Malaysia, by Faziharudean and Lily (2010), faculty of Business and accountancy, Graduate school of Business, University of Malaya, Malaysia. According to the Malaysia based research conducted to examine the factors that may affect customer intention to use mobile data service in personal usage context. It was revealed that 57% browse the Internet in search of information and other popular service followed by download of 43%, 35% updating information and accessing social sites such as Facebook and 28% Friendster. It was known from the research that female respondents are more inclined than male to download ringtones, music, game, graphics and movie content while the males develop more interest on obtaining updates for latest news, sports, stock market, traffic and whether condition . Faziharudean and Lily (2010) study the social influence of mobile data service on Malaysians youths and discovered that the Social influence was found to have a significant positive impact on the prediction of consumers' usage intention for mobile data services. This supports previous research that social influence from consumers' peers and superiors concerning technology usage was an important determinant of consumer behavior in information technology adoption contexts   . This same researchers also perceived from their survey the ease of use of mobile devices, technologies and its services by subscribers that the results also indicate that mobile users generally believe that to acquire the skill to use mobile data services is an easy, user-friendly learning experience. A perceived easy and clear interaction between users and the mobile data services promotes interest and consequently leads to consumers' intention to use the technology. The finding is in line with a study by Venkatesh et al. (2003) of the consistently prominent factors in explaining consumer behaviour in a variety of adoption models are perceived usefulness and perceived ease of use. Although, the study of mobile phones usage in Higher Education Institution in Nigeria, do not compare the mobile data service and call service usage which is the key findings in this study but the methodologies were adopted in the comparative study of mobile call service and mobile data service usage as both analysis of several variables is a good measure of the behavioural perception of subscribers combine with the descriptive survey design which was randomly distributed were adopted.

The impact of mobile service in Nigeria: on how mobile technologies are transforming the economic and social activities conducted by the Pyramid Research early march, 2010 in Nigeria, reveals the growth on the country

GDP, usage of mobile technologies, and the nation account for 47% of west Africa's total population and the Eight most populous in the world. Pyramid Research (2010), reveals the subscription penetration of mobile subscribers to 48.6% within 2001 and 2009 compare to other variables under the same study. Over the past two decades the mobile industry in West Africa has grown from a government controlled space to become a huge market fuelling economic growth and technological innovation . Mobile network operators are now heavily competing for the millions of African consumers looking to connect with each other in an easy and affordable manner. Proponents to this growth include The World Bank's investment of $50M USD in ICT infrastructure development and capacity building for Nigeria; as well as a fiber optic submarine West African Cable System (WACS) slated to dramatically increase broadband capacity for the region . According to industry estimates, West Africa holds 188millions mobile subscribers, nearly 30% of Africa's total mobile market share . Nigeria represents the largest share with over 95M subscribers with Ghana and Coted'Ivoire representing the next two largest markets at 21M and 17M respectively . The entire West Africa region has witnessed tremendous growth with an average growth rate of 9% per quarter .

GSM Association (2013), reveal some key growth area of mobile subscribers in the global market with some prediction even up to the year 2017. Most of these predicted areas are connections, subscribers, mobile data, and penetration of users. The global market has grown by 13.7% since 2008with nearly 7 billion total connections and an additional 2 billion connections projected to be added by 2017 . The subscribers of 3.2 billion people of the 7 billion on earth benefit from having a mobile phone. A further 700 million subscribers are expected by 2017, but this still leaves a huge potential for further growth (GSMA, 2013). Also the association reveals some facts about mobile data, and penetration rate, Data continues to be a major area of growth for mobile operators with all regions showing impressive growth rates. In fact, total traffic volume in 2012 alone was higher than previous years combined and globally data is projected to grow by 66% per annual through 2017. Data growth is driven by the increased penetration of smartphones, in particular in emerging markets and by increased data consumption per subscriber due to the faster download speeds and the uptake of data-hungry applications like video made possible by new technology such as 4G .

3. RESEARCH METHODOLOGY

3.1 Research   Area

The eastern heart state capital Owerri was used as a case study. Owerri is a city of Nigeria that is located in the south eastern part of Nigeria and at the centre of the Igboland. The Owerri city is more of a town, which is the administrative capital of the state of Imo, one of the thirty six states in the country of Nigeria .

3.2 Research Design

A self-administered questionnaire adapted was used to collect the needed data using three-point Likert-type scales. The population for this study is made up of citizens between the ages of 15 and above from Owerri, Imo state. All the participants were drawn out of citizen population ranges from 15 and above as at the time when this research work was carryout. This size of the population spanned across young and adult populace living and visiting the heartland city of Owerri, Imo state. The more percentage of the total population size was undergraduate and college students of some institution residing within the state. Owerri is predominantly a higher institution city housing Alvan Ikoku Federal College of Education, Federal University of Technology, Imo State University, Federal College Land Resources Technology, Federal Polytechnic, Imo State Polytechnic, Etc.

3.3 Research Sampling and Procedure

The sampling frame consisting of youth and adults were obtained from homes, schools, offices, business places and locations of several scopes, and randomly distributed among guests and visitors. A total of hundred and one (101) respondents participated in this research work. All the participants were drawn out of citizen population ranges from 15 and above as at the time when this research work was carryout. This size of the

population spanned across young and adult populace living and visiting the heartland city of Owerri, Imo state.

The questionnaires were given out to respondents with a brief enlightenment of the content require and patiently, separate attention was given to every question that were asked by respondents for better understanding and articulation of the research questions stated in the time new roman font style and fourteen font size printed survey question sheets. Though Interview and some verbal interactions were employed for this research but were not specified as the information was not used for these findings.

3.4 Method Data Analysis

A coding guide was developed **to** facilitate data entry. Data was analysed using SPSS (Statistical Computer Software) version 17.0 for windows. Results were presented using frequency tables, charts. Regression analysis was used to test the hypotheses at 5% level of significant, considered statistically significant. Regression analysis was used to determine the strength of association among the variables. The hypotheses were tested at 0.05% level of significance with the decision rule that states that at $F_{0.95}$ less than 0.05; we reject the null hypothesis and accept the alternative hypothesis. For $F_{0.95}$ greater than 0.05 we accept the null hypothesis and reject the alternative hypothesis. Mobile data service usage and mobile call service usage are the dependent variables in this study while independent variables are Age effect (X_1), Finance/Cost (X_2), Education effect (X_3) and Time spent effect (X_4) on mobile data service and mobile call service usage in mobile network in Nigeria. Hence, an independent variable makes a significant unique contribution to the prediction of the dependent variable when the significant value is less than 0.05 ($p \leq 0.05$)

$Y_1 = E_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$...Equation 1

$Y_2 = E_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$ ………………………..Equation 2 where

Y_1 = Mobile data services usage

Y_2 = Mobile call service usage

And the independent variables are examined and tested for both dependent variables respectively.

X_1 = Age

X_2 = Finance/cost

X_3 = Education

X_4 = Time spent

4. RESULT PRESENTATION AND DISCUSSION

4.1 Respondents' Characteristics and Classifications

Hundred and fifty (150) questionnaires were sampled randomly among citizens and visitors of the state capital, total of 101 respondents participated in this research work. Table 4.1 is respondents' characteristics and classifications. The survey is computed based on the hundred and one (101) responses. From the study population, thirty six (36) were females (35.64%), 65(64.36%) are males. The participants that were 12-15years of age were 1(0.99%), 20(19.80%) were 16-19years, 20-25years were 65(64.36%), 11(10.89%) were of age 26-30 and 4(3.96%) were of age 30 and above. The above analyses, 85.25% of the study population were young adults between the ages of 20-30years. 5(4.95%) responses were drawn from the northern states, 2(1.98%) responses from the western states, 70(69.31%) from eastern states, and 24(23.76%) from southern states of the nation. Table 4.1 also present the distribution of the sample according to the education level attained. Among the different level of educational attainment of respondents, 10(9.90%) were primary and post-primary education, 85(84.16%) were undergraduate while 6(5.94%) were graduate and postgraduate levels of education.

TABLE 4.1

Socio-Demographic Characteristics of Respondents

Categories	Frequency (N = 101)	Percentage (%)
Gender		
Male	65	64.36
Female	36	35.64
Age of Participants		
12-15	1	0.99
16-19	20	19.80
20-25	65	64.36
26-30	11	10.89
30 & Above	4	3.96
Regional Participants		
North	5	4.95
West	2	1.98
East	70	69.31
South	24	23.76
Educational Status		
No formal education	0	0.00
Pri. & post pri. Education	10	9.90
Undergraduate	85	84.16
Grad. & Post graduate	6	5.94

Source: field survey, 2013

4.2: Presentation and Analysis of Data

Table 4.2 presents the research objectives on the use of Mobile data service and Mobile call service. The used of mobile phone had with time generated into complex features of technological advancement compelling the users to the using and discovering capability of the device. Apart from the traditional purpose of this device as in linking base stations and connecting mobile stations, there are other services initiated by mobile service providers that have obviously diverted the primary function of this device to multifunctional levels of accessing the internet, short message services, and of course, the mobile phone voice call. This few notes and

reasoning prompt the interest of this research work to find out the Rates at which Mobile data service is used compare to the used of Mobile call service by subscribers in Nigeria.

TABLE 4.2

Interpretation of specific objectives

Categories	Frequency (101)	Percentage (%)
• Which of the mobile services is more expensive		
Mobile call expensive	53	52.48
Mobile data expensive	48	47.52
• The mobile service preferred		
Mobile data service	81	80.20
Mobile call service	20	19.80
• Mobile service (s) mostly use by subscribers		
Mobile data service(phone browsing)	49	48.51
Phone call service	44	43.56
SMS	07	6.93
Neutral (void)	01	0.99
• Number of users of mobile service		
Mobile data service	67	66.34
Mobile call service	34	33.66
• Most used type of mobile phone		
Voice call phone(only)	10	9.90
Browsing phone	91	90.10

• Subscribers preferred type of mobile phone		
Voice call phone(only)	4	3.96
Browsing phone	97	96.04

• Methods used for accessing the internet		
Cyber café service	9	8.91
PC with MODEM	23	22.77
Mobile phone access	69	68.32

Source: Analysis field survey, 2013

Determine the mobile service that is more expensive and not/less expensive to subscribers;

Table 4.2, item one, computes the specific numbers of respondents views and knowledge of subscribers on the cost of these mobile services. Out of the hundred and one questionnaires returned, 52.48% (53 respondents) established the fact that mobile call service is more expensive while 47.52% (48 respondents) ascertained that mobile data service is more expensive to subscribers. From the analyses and responses, it's deduced that mobile call service is mobile expensive for mobile service subscribers. This finding agreed with the work done on comparative analysis of mobile phone usage among women entrepreneurs in Uganda and Kanya by Komunte, et al (2012), stating that the biggest challenge face by Ugandans was buying of Airtime by 33% and 13.9% complained of network failure in the research population. The work of Faziharudean et al, (2010) on Customers Behavioural Intentions to the use of Mobile data services in Malaysia, also supports this finding.

The chart below; One (1) represent respondents percentage that cost mobile call service (52.48%) and Two (2) represent respondents percentage that cost mobile data service (47.52%).

Fig. 4.1: Expensive mobile service indicated by respondents
Source: Field survey 2013.

Determine the mobile service that is preferred

Tables 4.2, item (2); The mobile service prefer, 80.20% (81 respondents) of hundred and one responses, preferred mobile data service while 20 respondents (19.80%) preferred using mobile call service. The analysis above revealed the interest of mobile subscribers as eighty per cent (80.20%) of the research population preferred the use of mobile data service to mobile call service. This is also similar to the work of Kumunte et al (2012), revealing that 91% of Kenya and 72% of Uganda respondents used mobile phone internet related functions. Pyramid research also predict percentage users of mobile data and call services to be 30% and 6% compare to other variables, mobile broadband recorded the highest percentages.
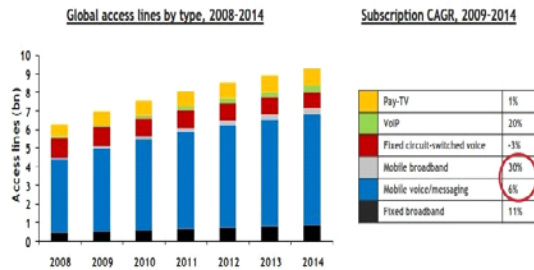
Fig. 4.2: Comparing mobile data and call service usage
Source: Pyramid Research, 2010.

Determine the mobile service(s) mostly used by subscribers

Table 4.2, item 3 contain the participants' responses on the mostly used mobile service(s). 48.51% (49 respondents) of the research population indicate the fact of using mobile data service most, 43.56% (44 respondents) uses phone calling most, 6.93% (7 responses) uses short message service (SMS) and 0.99% (1 respondent) indicate interest for all the services. It agreed to the work of Hub Research, Kumunte et al, (2012) and Faziharudean et al, (2010) customer's behavioural interests and intentions on mobile services. Pyramid Research, (2010) support the same result from the chart above (figure 4.2). Despites other contributions affirming the same result, the work on Mobile phones in Higher Education Institutions, A case study of Nigeria University, at Obafemi Awolowo University, Ile-Ife by Francisca (2008), analysed from his findings that 98.78% subscribers uses their phones for contacting parents, friends and loved ones, and checking of emails functions had less percentage as a result of most dominated traditional Nokia, Samsung and Sony Erickson phones that existed within 2002 and 2007 research period not until the introduction of 3G services by Globacom in 2009 and smartphones mostly dominating the Nigeria markets late 2010 till date.

Compare and contrast the number of users of both services

The record above in table 4.2 item 4 indicates the number of mobile subscribers using the different mobile services. 67 respondents (66.34%) indicated as users of mobile data service while 34 respondents (33.66%) established that they used mobile call service. From the analysis, users of mobile data service are more than users of mobile call service. Pyramid Research findings in March 2010, established same result from predictions and forecasts of mobile subscription using 3G services in three year time based on the outcome of the research

work summarized in the chart below of 55% population which is more than half of the populace. Faziharudean et al, (2010) agreed on the same fact in Customer's behavioural intentions on mobile data services in Malaysia.

Pyramid forecasts that over 55% of mobile subscriptions in the world will be using 3G+ in the next three years
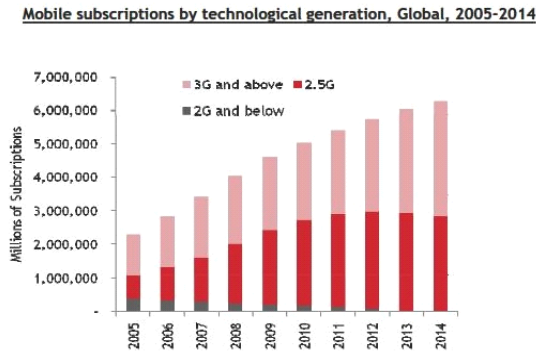

Fig. 4.4: Mobile subscription in world using 3G+ services.
Source: Pyramid Research, 2010.

Determine the most subscriber used type of phone

It was also determined from the research work recorded in table 4.2 item 5 that 10 respondents (9.90%) uses traditional mobile phones while 91 respondents (90.10%) uses browsing phones. The user gap between these types of mobile phones is much as 91 respondents out of the total research population are using browsing phones.

Determine subscriber prefer their type of phone

As indicated in the table 4.2 above, a total of 4 respondents (3.96%) of the research population preferred traditional mobile phone while 97 respondents (96.04%) preferred browsing mobile phone. Table 4.2.1 indicating the reason why subscribers prefer using browsing phone. Over 97 respondents preferred browsing phone for different reason, the table below record and itemize

these reasons. 4.12% (4 respondents) of 97 respondents that prefer browsing phone uses and prefer browsing phone because is less expensive, 19.59% (19 responses) of the same population (97 respondents) of participants that prefer browsing phone, preferred it for entertainment and 74 (76.29%) of 97 respondents preferred browsing phone for browsing and accessing the internet. Similar mobile services studied by HubResearch, Kumunte et al, (2010), Pyramid Research (2010) and Faziharudean et al, (2010) support this result.

The chart below revealed the general interest and reason while mobile service subscriber used browsing phone. 74 respondents out of the 97 population that prefer browsing phone, used the browsing phone for browsing while 19 participants used browsing phone for entertainment and 4 participants within the same population preferred browsing uses the type of phone because of the service and features enabled are less expensive.

Fig. 4.5: Reasons why subscriber used Browsing Phone
Source: Field survey, 2013

Fig 4.6: Reason why subscribers uses Traditional mobile Phone
Source: field survey, 2013

TABLE 4.5						
Mobile data service usage and its independent variables Correlations						
		Data service	Age	Finance	Education	Time
Pearson Correlation	Data service	1.000	.416	-.105	-.012	.083
	Age	.416	1.000	.003	.036	.155
	Finance	-.105	.003	1.000	-.046	-.078
	Education	-.012	.036	-.046	1.000	.079

	Time spent	.083	.155	-.078	.079	1.000
Sig. (1-tailed)	VAR00001		.000	.148	.454	.205
	VAR00002	.000	.	.488	.359	.061
	VAR00003	.148	.488	.	.324	.220
	VAR00004	.454	.359	.324	.	.218
	VAR00005	.205	.061	.220	.218	.
N	VAR00001	101	101	101	101	101
	VAR00002	101	101	101	101	101
	VAR00003	101	101	101	101	101
	VAR00004	101	101	101	101	101
	VAR00005	101	101	101	101	101

4.3 Hypothesis Testing and Results

The hypothesis testing is based on two different dependent and independent variables. The models are sets of dependents variables (Y_1 and Y_2) and their corresponding independent variables. Y_1 is Mobile data service usage with independents variables as Age, Finance (service cost), Education and Time spent. While Y_2 is mobile call service usage with the same X_1, X_2, X_3 and X_4 as Age, Finance, Education and Time spent respectively.

Hypothesis (1); Mobile data service usage hypothesis testing

Table 4.7; shows the Bata values of the independent variable in relationship with the dependent variable. Regression analysis was conducted to analysed the variables with window version 17.0 SPSS a statistical software. I examined Age, Finance, Education and Time spent against the dependent variable (Mobile data service usage)

Source: Analysis of field survey 2013

TABLE 4.7										
Mobile data service usage and independent variables Coefficients										
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	8.706	1.067		8.163	.000	6.589	10.823			
	Age	.431	.097	.415	4.449	.000	.239	.623	.416	.413	.410
	Finance	-.092	.080	-.107	-1.153	.252	-.251	.067	-.105	-.117	-.106
	Education	-.033	.092	-.033	-.355	.724	-.214	.149	-.012	-.036	-.033
	Time	.014	.097	.013	.139	.889	-.180	.207	.083	.014	.013
a. Dependent Variable: Mobile data service usage										

Table 4.5 is testing the relationship between the independent variables and shows the correlation coefficients between the independent variables, which shows a normal correlation (less than 0.90) between the independent variables and this does not affect the results of multiple regression that is adopted in this study.

Hence, there is a higher correlation problem between the independent variables (multi-co linearity) when the correlation coefficient is greater than 0.9. Therefore, from the table above the problem of higher correlation is not found between the two independent variables of the study variables. The largest correlation coefficient between two independent variables of the study was found between Mobile data service and Age with relationship strength equal to 0.416 and follow by Time spent and Age of 0.155.

TABLE 4.6									
Mobile data service usage Model Summary									
				Std.	Change Statistics				
Model	R	R Square	Adjusted R Square	Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.430a	.185	.151	1.13148	.185	5.454	4	96	.001
a. Predictors: (Constant), Time spent X_1, Education X_2, Finance X_3, Age X_4									

From Table 4.6, the study found that the independent variables combined were in relationship with the dependent variable of 0.430 which is a strong positive relationship, in addition to the contribution of all independent variables to the dependent variable with R-square of 0.185. This indicates that the independent variables combined account for 18.5% percentage of the change in the behavior of the dependent variable (Mobile data service usage in Nigeria), and others variables associated but not tested in this research work account for the remaining percentages, while the statistical independent constructs amounted to the impact of these variables combined on the dependent variable through the adjusted R-square 0.151

- Ho: There is no significant effect on Age and mobile data service usage

    H_A: There is significant effect on Age and mobile data service usage

From Table 4.7; The Unstandardized coefficient of Age variable X_1 is 0.431 with t-value of 4.449 and at statistical significance p-level of 0.000 which is less than 0.05. Hence, the study rejects the null hypothesis and accepts the alternative hypothesis. Age variable has significant effect on mobile data service usage in Nigeria where $\beta = .431$ $P < 0.05$; we therefore conclude that Age has effect on Mobile data service usage in Nigeria. This also mean that Age variable alone affect the use of mobile data service in Nigeria

- Ho: There is no significant effect on Finance and mobile data service usage

    H_A: There is significant effect on finance and mobile data service usage

From Table 4.7, The Unstandardized coefficient of Finance variable X_2 is -0.092 with T-value -1.153 and at statistical significance p-level of 0.252 which is greater than 0.05. Hence, the study accepts the null hypothesis and rejects the alternative hypothesis. Finance variable has no significant effect on mobile data service usage where $\beta = -.092$ $P > 0.05$; we therefore conclude that Finance has no effect on Mobile data service usage in Nigeria.

- Ho: There is no significant effect on Education and mobile data service usage

    H_A: There is significant effect on Education and mobile data service usage

From Table 4.10, The Unstandardized coefficient of Education variable X_3 is -.033 with T-value 0.724 and at statistical significance p-level of .724. Hence, the study accepts the null hypothesis and rejects the alternative hypothesis. Education variable has positive influence on mobile data service usage where $\beta = -0.033$ $P > 0.05$; we therefore conclude that Education has no significant effect on Mobile data service usage in Nigeria.

- Ho: There is no significant effect on Time spent and mobile data service usage

    H_A: There is significant effect on Time spent and mobile data service usage

From Table 4.10, The Unstandardized coefficient of Time spent variable is -.014 with T-value of 0.139 and at statistical significance p-level of 0.889 which is greater than 0.05. Hence, the study accepts the null hypothesis and rejects the alternative hypothesis. Time spent variable has no significant effect on mobile call service usage where β = -.014 P > 0.05; we therefore conclude that Time spent has no significant effect on Mobile data service usage in Nigeria.

TABLE 4.8 ANOVA for Mobile data service usage					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	27.929	4	6.982	5.454	.001[a]
Residual	122.903	96	1.280		
Total	150.832	100			
a. Predictors: (Data service), Time spent, Education, Finance, Age					
b. Dependent Variable: Mobile data service					

The ANOVA table report on the general model. As Probability value (P) is less than 0.05, the model is significant. Thus, the combination of the variables significantly predicts the dependent variable (F=5.454; P=0.001<0.05). The table shows that the collective influence of all aspects of mobile data service usage variables (Age, Finance, Education and Time spent) have significant influence on the usage of Mobile data service in Nigeria. It indicates that the specified model and data are well fit in explaining the influence and reliable for decision making on usage of mobile data service in Nigeria.

Regression model for mobile data service usage in Nigeria; Mobile data service (Y_1) = E_0 + Age(X_1) + Finance(X_2) + Education(X_3) + Time spent(X_4) Where E_0 = 1.13148(from model summary table 4.6), and coefficients of the independent variables are below; X_1 = 0.416, X_2 = -.105, X_3 = -.012, X_4 = .083

$$Y_1 = 1.13148 + 0.416X_1 - 0.105X_2 - 0.012X_3 + 0.083X_4 \ldots\ldots\ldots..equ. 1$$

The regression model above show that mobile data service usage (Y_1) reduces (increases) by -.416 for every one measure decreases or increases of Age variable X_1, Age variable X_1 reduces or increases by =0.105 for every one measure of decreases or increases of Finance X_2, Finance variable X_2 reduces or add by -0.012 for every one unit reduction or addition of Education variable X_3, so applicable for Time spent variable X_4. Hence, X_1 (Age of users) is more significant for mobile data service usage in Nigeria.

Hypothesis (2); Mobile call service usage hypothesis testing
Table 4.10 shows the values of the unstandardized coefficients of Bata (β) of independent variables on the dependent variable (mobile call service usage).

TABLE 4.9 Model Summary for Mobile call service usage									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.682[a]	.465	.443	.98664	.465	20.900	4	96	.000

a. Predictors: (Constant), Time spent(X_4), Education (X_3), Finance (X_2), Age (X_1)

From Table 4.9, the study found that the independent variables combined were in relationship with the dependent variable of 0.682 which is a strong positive relationship, in addition to the contribution of all independent variables to the dependent variable with R-square of 0.465. This indicates that the independent variables combined to account 46.5% percentage of the change in the behavior of the dependent variable(mobile call service usage in mobile telephone in Nigeria), which considered a high percentage, while the statistical independent variables measure to the impact of these variables combined on the dependent variable through the adjusted R-square 0.443.

TABLE 4.10
Coefficients of independent variables on mobile call service usage

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Y_2)	3.728	.747		4.991	.000	2.245	5.211					
	Age	.260	.056	.391	4.633	.000	.149	.372	.557	.427	.346	.780	1.281
	Finance	.164	.068	.181	2.401	.018	.028	.299	.227	.238	.179	.984	1.017
	Education	.077	.024	.240	3.210	.002	.029	.125	.256	.311	.239	.994	1.006
	Time sp.	.197	.056	.294	3.502	.001	.085	.309	.493	.337	.261	.788	1.269

a. Dependent Variable: Mobile call service usage

- Ho: There is no significant effect on Age and mobile call service usage

  H_A : There is significant effect on Age and mobile call service usage

From Table 4.10, The Unstandardized of Age variable X_1 is 0.260 with T-value 4.633 and at statistical significance p-level of 0.000. Hence, the study rejects the null hypothesis and accepts the alternative hypothesis. Age variable has effect on mobile call service usage where $\beta = 0.260$ $P < 0.05$; we therefore conclude that Age significant effect on Mobile call service usage in Nigeria.

- Ho: There is no significant effect on Finance and mobile call service usage

  H_A: There is significant effect on finance and mobile call service usage

From Table 4.10, The Unstandardized coefficient Finance variable X_2 is 0.164 with T-value 2.401and at statistical significance p-level of 0.018. Hence, the study rejects the null hypothesis and accepts the alternative hypothesis. Finance variable has positive influence on mobile call service usage where $\beta = .164$ $P < 0.05$; we therefore conclude that Finance has significant effect on Mobile call service usage in Nigeria.

- Ho: There is no significant effect on Education and mobile call service usage

  H_A: There is significant effect on Education and mobile call service usage

From Table 4.10, The Unstandardized coefficient of Education variable X_3 is 0.079 with T-value 3.210 and at statistical significance p-level of .002 which is less than 0.05. Hence, the study rejects the null hypothesis and accepts the alternative hypothesis. Education variable has positive influence on mobile call service usage where $\beta = 0.079$ $P < 0.05$; we therefore conclude that Education has significant effect on Mobile call service usage in Nigeria.

- Ho: There is no significant effect on Time spent and mobile call service usage

  H_A: There is significant effect on Time spent and mobile call service usage

From Table 4.10, The Unstandardized coefficient of Time spent variable X_4 0.197 with T-value of 3.502 and at statistical significance p-level of 0.001 with is less than 0.05. Hence, the study rejects the null hypothesis and accepts the alternative hypothesis. Time spent variable has positive effect on mobile call service usage where $\beta = .197$ $P < 0.05$; we therefore conclude that Age has significant effect on Mobile call service usage in Nigeria.

TABLE 4.11
Anova on Mobile call service usage

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.380	4	20.345	20.900	.000a
	Residual	93.452	96	.973		
	Total	174.832	100			
a. Predictors: (Constant), X_4, X_3, X_2, X_1						
b. Dependent Variable: Mobile call service usage						

The ANOVA table report on the general model. As Probability value (P) is less than 0.05, the model is significant. Thus, the combination of the independent variables significantly predicts the dependent variable (F=20.900; P=0.000 < 0.05). The table shows that the collective effect of all aspects of mobile data service usage variables (Age, Finance, Education and Time spent) have high significant effect on the usage of Mobile call

service in Nigeria. It indicates that the specified model and data are well fitted in explaining the effect of usage of mobile call service in Nigeria.

Regression model for mobile call service usage in Nigeria; Mobile call service usage $(Y_1) = E_0 + Age(X_1) + Finance(X_2) + Education(X_3) + Time\ spent(X_4)$ Where $E_0 = 0.98664$ (from model summary table 4.9), and coefficients of the independent variables are below; $X_1 = 0.557$, $X_2 = 0.227$, $X_3 = 0.257$, $X_4 = 0.493$

$$Y_1 = 0.98664 + 0.557X_1 + 0.227X_2 + 0.257X_3 + 0.493X_4 \ \ldots\ldots\ldots\ldots\ldots Equ.\ 2$$

The regression model above show that mobile call service usage (Y_1) reduces (increases) by 0.557 (55.7%) for every one measure decreases or increases of Age variable (X_1), Age variable (X_1) reduces or increases by =0.227 for every one measure of decreases or increases of Finance X_2, Finance variable X_2 reduce or add by 0.257 for every one unit reduction or addition of Education variable X_3, so applicable for Time spent variable X_4. Hence, X_1 (Age of users) is more significant for mobile call service usage in Nigeria.

Table 4.12 is testing the relationship between the independent variables and shows the correlation coefficients between the independent variables, which shows a normal correlation (less than 0.90) between the independent variables and this does not affect the results of multiple regression that is adopted in this study. Hence, there is a higher correlation problem between the independent variables (multi-co linearity) when the correlation coefficient is greater than 0.9. Therefore, from the table above the problem of higher correlation is not found between the two independent variables of the study variables. The largest correlation coefficient between two independent variables of the study was found between Age (X_1) and mobile call service usage (Y) with relationship strength equal to 0.557 follow by Time spent (X_4) and mobile call service usage (Y) amounted 0.493, Time spent(X_4) and Age (X_1) account for 0.460 etc.
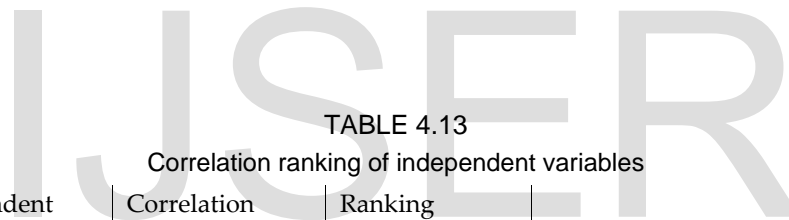
TABLE 4.13
Correlation ranking of independent variables

Independent variables	Correlation value	Ranking
Age (X_1)	0.557	First
Time spent (X_4)	0.493	Second
Education (X_3)	0.256	Third
Finance (X_2)	0.227	Fourth

Source: table 4. 12

It's obvious from table 4.13 that Age (X_1) variable has the highest influence on mobile call service usage with a value of 0.557, followed by Time spent (X_4) with a value of 0.493, Education (X_3) with 0.256 and last Finance (X_2) with the value of 0.227.

4.4 Discussion of Results

The research work on the Rates of mobile data service usage and mobile call service usage revealed many comparative results of both services in the mobile telecommunication services in Nigeria. Mobile station initially designed for connecting other stations via telecommunication base stations for traditional voice communication services as at the time of inception, later developed and advances into other value added services including mobile data service which stimulated the interest to search out the rates of used of other mobile services compare to the traditional mobile voice call service.

Mobile Telephone Data service Usage in Nigeria (Y_1)

From Table 4.5 correlations of independent variables and Usage of mobile telephone data service (dependent variable, Y_1), Age variable (X_1) shows the highest correlation figure compared to other variables and the dependent variable of 0.416(41.6%), followed by Time spent (X_4) 0.083(8.3%), Education (X_3) -0.012 then Finance/cost (X_2) -0.015. Table 4.6 is mobile data service usage model summary shows the relationship of the independent variables at R-value of 0.430 and the R^2 – value 0.185 (18.5%) which indicates that the variables as a whole accounted for 18.5% changes and significance on mobile telephone data service usage in Nigeria while the rest percentage is measured by other factors not study in this work. Table 4.8 is ANOVA for mobile data service usage shows the significant of the model as a whole at a p-value 0.001 < 0.05 the error allowed, indicating the combined effect of the independent variables on the usage of mobile telephone data service in Nigeria.

- **Age effect on the Usage of mobile telephone data service**

Age variable was revealed from Table 4.7 of p-value 0.000<0.05 error allowed as the only factor that affect the usage of mobile telephone data service in Nigeria alone compared to other variables and also has high correlation relationship with the usage of mobile telephone data service in Nigeria accounting for 43.1% effects on the changes and subscribers using mobile data service which implies that young people within the age of 16-30years uses mobile data service more than adults of 30years and above in mobile telephone data service in Nigeria supported by the findings of Faziharudean and Lily, (2010) on Customers' behavioural intentions to use mobile data services in Malaysia.

- **Finance/Cost effect on the Usage of mobile telephone data service**

Table 4.7 revealed the relationship of mobile data service cost and the usage of the service on the account of p-value 0.252>0.05 error allowed implies that finance variable has not significantly affected the usage of mobile telephone data service in Nigeria. This is confirmed important, valuable and worthy of acceptance as 53% of the 101 research population indicated that mobile data service is not expensive (from Table 4.2 above) compared to mobile call service and 96% of the study population indicated mobile telephone data service as the most preferred mobile telephone service in Nigeria, also supported by the findings of the Pyramid Research and Faziharudean, et al (2010).

- **Education effect on the Usage of mobile telephone data service**

Table 4.7 shows that education has not significantly impacted on the usage of mobile telephone data service in Nigeria as all subscribers' despites the level of education, young adults predominantly use mobile data service more for facebook, WhatApps, 2go, and other social application with a p-value of 0.724>0.05 significance error allowed. The penetration of mobile devices in the internetworks studied and revealed by Pyramid Research (2010) and NCC (2012) records their findings without indicating education level as a determinant for using and subscribing for mobile telephone data service in Nigeria.

- **Time spent effect on the Usage of mobile telephone data service**

Table 4.7nshows that Time spent has not significantly affected the usage of mobile telephone data service in Nigeria with p-value 0.889 > 0.05 level of confidence as a result of subscribers spending un-measureable time on mobile telephone data service as indicated by 49% of the respondents compared to the rest 51% shared among phone calling (44%), SMS (07%), and void (01%) of the same respondents population. The work of Faziharudean and Lily (2010) supported this finding.

Mobile telephone Call service Usage in Nigeria (Y_2)

Table 4.9 is Regression model summary for mobile telephone call service usage in Nigeria shows the relationship of the whole independent variables (Age, Finance, Education and Time spent) combined and accounted a strong R-value of 0.682 and R^2 –value 0.465 (46.5%) of impacts on the effect of usage of mobile telephone call service in Nigeria while the rest percentage accounted for factors outside this study on the use of mobile telephone call service in Nigeria. Table 4.11 is ANOVA result on mobile telephone call service usage in Nigeria revealed combined significance of all the independent variables (Age, Finance, Education, Time spent) level at p-value of 0.000<0.05 level of confidence with $f_{-tab} > f_{-cal}$ (20.900>2.6..). Also, the variable correlation and

relationship with the mobile telephone call service usage (dependent variable, Y_2) are revealed in table 4.9 and 4.12 for Age (X_1) 0.557 (55.7%), followed by Time spent (X_4) 0.493 (49.3%), Education (X_3) 0.256 (25.6%), then Finance/cost (X_2) 0.227 (22.7%) values and percentages of relationship with the usage of mobile telephone call service in Nigeria by subscribers.

- **Age effect on the Usage of mobile telephone call service**

Table 4.10 is the coefficients of independent variables on mobile telephone call service usage in Nigeria shows that Age factor has significant impact on the usage of mobile call service in Nigeria as p-value 0.000<0.05 significance level of error allowed. This result is worthy of all acceptability and confirmation as almost all age of the Nigeria citizens possessed mobile stations for the primary purpose of connecting mobile stations and staying in tune with family members supported by the population responses as second preferred mobile telephone service (20%) and 44% of most used mobile service of the research population and the findings of Francisca (2008) on mobile phones in Higher Education institutions in Nigeria university.

- **Finance/Cost effect on the Usage of mobile telephone call service**

Table 4.10 revealed that finance factor has significantly affected the usage of mobile telephone call service in Nigeria as customers and subscribers tends to reduce expenses by subscribing to same and similar service provider. With p-value of 0.018<0.05 error allowed statistically approved and standardized for comparing variables and level of associations. This result was confirmed by the indication of 53% of the research population that mobile telephone call service is the most expensive mobile telephone service in Nigeria compared to 48% indication of mobile data service usage supported by the work of Faziharudean and Lily (2010) on Consumers' behavioural intentions to use mobile data services in Malaysia and Pyramid Research (2010) in Nigeria.

- **Education effect on the Usage of mobile telephone call service**

Table 4.10 shows that education has significantly impacted on the usage of mobile telephone call service in Nigeria with p-value of 0.002<0.05 statistical level of error allowed as awareness of moderates and less call plans spur customers to call more especially for urgent issues and situations. Mobile call service usage is appreciated by users for official and most urgency of matters but recorded as the second most used mobile telephone services in Nigeria supported by the work and publication of Komunte, et al (2012) on comparative analysis of mobile phone usage among women Entrepreneurs in Uganda and Kenya.

- **Time spent effect on the Usage of mobile telephone call service**

Table 4.10 shows that Time spent has significantly affected the usage of mobile telephone call service in Nigeria with p-value 0.001<0.05 level of statistical error allowed. This impact is as a result of subscribers spending less time in using mobile telephone call service to minimised cost as the mobile telephone service was indicated as the most expensive mobile service in Nigeria by 53% indications of the entire research population and absolutely supported by the work of Faziharudean, et al (2010) on Customers behavioural intentions to use mobile data services in Malaysia of greater percentage of subscribers using mobile data service compared to others as 43% internet users and the rest percentages shared among other mobile telephone services.

- **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

5.1 Summary

Mobile telecommunication services had significant influence on customers' daily activities and investments in prospects of time, including areas of profits and long term life sustainability. Mobile phones were designed to aid mobile communication and interconnections among mobile service subscribers traditionally for voice call via telecommunication networks media at its inception. Further advancement and service improvement in recent time had diversified mobile services including data service which is recorded as the most used mobile service among others by young adults between the age of 16 – 30 years and educated adults supported by

recent work of Faziharudean et al. (2010). It's obvious, that mobile user demands smart phones with the most interest in Internet connection and access to different businesses, financial and social networks.

On the basis of the results obtained from the analysis in the study, we summarize our findings as follows:

- **Mobile telephone data service usage (Y_1)**

- There is a great level of relationship between independent variables as a whole and the usage of mobile telephone data service in Nigeria
- Age effect was the only significant factor when compared alone with the usage of mobile telephone data service in Nigeria
- All other independent variables; Finance, Education, and Time spent were not found significantly affecting mobile data service except Age variable having significant effect on mobile telephone data service in Nigeria.

- **Mobile telephone call service usage (Y_2)**
    - There is a great level of relationship between all the independent variables as a whole accounting for 46.5% of r^2 value from Table 4.9 and the usage of mobile telephone data service in Nigeria.
    - Age factor when compared to other variables has the highest degree of relationship with the usage of mobile telephone call service in Nigeria.
    - Time spent was recorded with the second high degree relationship with mobile telephone call service in Nigeria.
    - All the independent variables were also found to be significant on comparing them individually with the usage of mobile telephone call service in Nigeria.

It is important to note that Age factor in the whole of this research work was found as the only variable which has significant effect on both mobile telephone data service and mobile telephone call service in GSM network in Nigeria with significance p-values of 0.000 and 0.000 respectively less than the statistical significance error allowed.

5.2 Conclusion

The Rates of mobile data service usage and mobile call service usage in Nigeria recorded significant facts in relation to customers' interest in use of these services. 80.20% of respondents preferred mobile data service to 19.80% of the research population that preferred mobile call service. 97 (96.04%) respondents used mobile phone browsing most over 4 (3.96%) respondents using mobile phone calling most. Mobile call service was recorded as the most expensive mobile service from the responses of 52.48% of the research population in term of mobile communication. Customers interest being driven by Internet and networks access, 90.10% of the total respondents uses browsing enabled phones while 9.90% of the population uses traditional mobile phone for call making with most entertaining interest in browsing phones. Though, all mobile phone service subscribers uses call service but it is recorded as the second most used mobile telephone service supported by recent and similar studies of Kumunte, et al. (2013) and others. Having examined the rates at which mobile service subscribers uses these telecommunication services, it was most significant and necessary to note that in spite of the fact that all these services are integrated into a single device called mobile station, the use of these services had independent restrictions and are not equally distributed as subscribers' interest are driven and influenced towards the most efficient, less cost, and entertaining service. Though, reliability issue is eminent and associated with telecommunication services in Nigeria, mobile data service usage among consumers increase steadily as enlightenment is being carry out within subscribers neighbourhoods.

5.3 Recommendations

Customers of all category relied on mobile services for their daily functions. Corporate firms, organization, human associations and governmental functionalities depends on the services provided by mobile

telecommunication service providers such as MTN, Globacom, Etisalat, Airtel and Starcomm within Nigeria and west central Africa for quick service delivery and efficient performance of job responsibilities. The common used services are mobile data service, mobile call service, short message services, where most of these services are integrated under data services such as Internet access, Instant messaging (IM), blackberry pinging services and social networks messaging services etc. The following recommendations are important for service providers, government and further similar and extended research work on mobile telecommunication in Nigeria.

- Mobile   telecommunication service providers should optimize mobile data service as most mobile service subscribers' interest are attracted towards this mobile service which in near future might cause service congestion.
- Reliability problem and related issues with telecommunication services should be address and minimize or possibly eliminated as point of focus as not to discourage mobile service subscribers.
- The cost of mobile services should be moderated at a steady price rate by all service provider especially, mobile call service which is the most expensive mobile service, as it is adopted and performed in other developing and developed nations of the world.
- Government of the nation Nigeria should improve infrastructural and basic amenities such as power (electricity), national fibre optic backbones and upgrading of cities to aid the function of these electromagnetic services to customers in our neighbourhood which would reduce service providers' expenses and in turn enlarge their service capacity and overall performance. Also the importation of smart phones which is the major node of mobile service diversification should be subsidized by lowering import tariff on mobile devices.

Further research work in this area should be carry out on other mobile services especially, on most reliable service, cost effectiveness of these mobile services, the economic implication on the nation GDP and other developmental nodes of the nation sustainability. Indeed, mobile data service had experience high customers patronage at the inception of smart devices including mobile smart phones.