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An Empirical Analysis of Demand for GSM Service: A Case of Students of A. B. U, Zaria-Nigeria

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Abstract:
This study has attempt an evaluation of the demand for GSM services in the department of economics A, B, U, Zaria. In doing so, it has examined and evaluated the factors that determined the preference and demand for GSM services. This study has collected and analysed data from the primary sources by administering 100 questionnaires through a stratified sampling according the degree level of 100, 200, 300 and 400 levels each with 26.6% respectively with the exception of 300 level which is 20.2% and about 94% responded. The econometric analysis was built on the non-parametric test of chi-square was used to test the statistical significant of the result reported in bi-variate table or cross tabulations. In hypothesis one the calculated value was 39.91% while the tabulated value was 36.4%, we reject null hypothesis and accepted the alternative hypothesis that ''efficiency of network lead to preference of a particular network''. Hypotheses two the calculated value was 18.69% while the tabulated is 27.10%. Therefore, the null hypothesis was accepted showing that '' there is a significant relationship between GSM tariff and demand for GSM services''. While in hypothesis three the calculated value was 21.23% while the tabulated value was 9.49%, the null hypothesis was equally rejected showing that ''efficiency of network determines how students rank the network''. This finding invalidates the demand theory, which says that price is the major determinant of demand. The study finds out that efficiency of network is the major yardstick for measuring (determining) the demand for GSM services by the students. This is to say that price is not really a major determinant of the demand for GSM services among the students, but rather efficiency of the network and choice or preference by the students. We can infer that majority of the students subscribed to MTN due to its network efficiency. The study recommend that Nigerian Communication Commission (NCC) should be more vigilant in enforcing the relevant laws that would motivate the GSM providers to be more effective in service provision as well as improved facilities and services in terms of enhancement of technology that will advance the industry in improving efficiency and effectiveness of GSM service. In conclusion, the purpose of this study is to be able to understand the pattern of demand for GSM and how consumers make preference among the services. This study will also be beneficial to the GSM service operators, GSM service regulators in enforcing there rules and it will go a long way in impacting on the general understand of the preference for GSM service among the consumers.

Keywords: *GSM, efficiency, preference, subscription, tariff, network and demand*

1. Introduction

The use of Global System for Mobile (GSM) is a recent development in Nigeria. However, there has been a rapid increase in its use in about four years from its advent in August (2001). According to Communication Africa (2002), adoption rate of 75% of the GSM was achieved in Africa year after year. Telephone, mobile, GSM or otherwise were once seen as a luxury in Nigeria, but it's now becoming an integral part of everyday life. The use of GSM phones in Nigeria well exceeds that of the fixed line even those on the lower income that much of their income is sent on communication cost than the developed world Peter (2004). The development of fixed lines communication however is still being constrained by a number of factors including inefficiency in the service, corruption, and mismanagement, unqualified staff and lack of finance. The seed of change and ability to promote an efficient commutation infrastructure is key to Nigeria's ability to impact on the global order in a digital age Peter (2004). With the current boom in Nigerian telecommunication industry, the development of telecommunication industry is recognised as one of the most important as it provides a significant role to both individuals and the government.

On the individual level, there are apparent motives for the individual using the global system for mobile (GSM). One of such is to be able to communicate regardless of place and the second is to show off as the cost of GSM and service charges decrease the tendency to use them as a status or symbol of communication also increase. However, this ending show off trend seems to be in a downward trend nowadays as further decrease in the cost of having a GSM phone make it affordable forever more people (Yusuf, 2003, pp. 241-254).

The fact that GSM has created the habit of time management in Nigeria; it was noticed right from the curtailment of expensive Nigerian solutions, while contributing to the reduction of motor accidents on major highways due to the elimination of long journey for pleasure and for business. It is now convenient to place a call to business associates or relatives rather than waste valuable time embarking on sometimes needless journeys (BizTech Africa, 2003, p. 3).

On the national level, it is widely acknowledge that the introductions of competitive service into the telecommunication industry will benefit the economy in a numbers of ways. One of such is the revenue that has been lost by the monopoly of NITEL through the grey market can be recovered. This revenue could then be channelled to developmental programmes of the government, which is provision of capital projects that will benefit the masses (Brain, 2004, p. 20). Investors felt secure investing in the economy now as the GSM has offered a cornerstone in Nigeria's race towards attainment of adequate infrastructure through the improved in internet and information technology awareness by the use of wireless application protocol (WAP), E-commerce businesses can make mobile payment called e-payment among others (Nigerian Business Information, 2003). The willingness and ability of foreign investors to invest in the telecommunication sector is evidence in Nigeria. It is against this background that enormous economic growth and telecommunication expansion that the country is now witnessing increased investment particularly in the telecommunication industry (Bola, 2002). With the massive increase in investment in the telecommunication industry, Nigeria stand the chance of reducing unemployment to the bearest minimum level as more and more people are now engaged in small and medium telecommunication business, ranging from investors, operators, consultants and vendors (Brain, 2004).

Global System for Mobile (GSM) provides high flexibility in managing the network resource through a reprogrammable technology. This supports modifications to the system coverage area and optimizes performance over high demand areas. Users will be able to use the services (GSM) in areas that are served with capable networks. With the high network coverage the GSM will be a great help in term of emergencies (Aijaz, 2002). The emergence of internet telephone has change the traditional enterprises communication for the good, bringing with it the promise of cheaper local and international call into and out of Nigeria. However, the opportunity for internet access through GSM phone adds much to the satisfaction sought from GSM phone by undermining the so called one on one communication provided by household telephone (Yusuf, 2003, pp. 241-254).

True the demand for GSM services is growing and the GSM service providers are making high and increasing profit. However, there are growing complaints about service quality and service prices. These main questions about customer satisfaction and consumer preference are both theoretical as well as empirical issues. Given the implications of GSM for consumer welfare and productivity, theoretical and empirical investigations are imperative.

1.1. Problem Statement

The demand for GSM services in Nigeria has increased to a high rate and saw the country to be rated as one of the highest consumer of telecommunication service in Africa. At the same time level of service provision left much to be desire as many of the providers increase the number of line without any increase in the quality of service and that put the consumer at the receiving end while the pay for a service that is not provided. According to Budde Comm (2003), Nigeria has the Africans largest mobile market, rapid growth lead to the problem with the network congestion and quality of service which prompted the telecommunication regulators to improve fines and sanctions. With this situation the consumers of GSM services are left with a choice of making a preference among the services providers with the most efficient service. It is also documented by the Nigeria Business Information (2003), that telecommunication sector has made it possible for there to be 2.5 million individual subscribers of GSM in Nigeria. According to the Nigerian Telecommunication Commission (2002), the number of inactive lines in the country continue to increase, reaching 40.4 million, the highest in the history recorded far, it show that about 12.7 million lines went redundant. The number of the inactive are increasing by the day indicating that consumer are shifting from one network to another due to the quality of service and given the choice they have among the service providers. These problems have the potential limiting the satisfaction of consumers for the service they pay for; therefore, they are left with the choice of making a preference among the best available network.

1.2. Research Questions

The students particularly university students appear to constitute a significant percentage of the growing demand for GSM services. The issues of consumers' sovereignty and preference raise the following research questions in the context of the students of A. B. U, Zaria.

a. What is the structure of the preference for GSM service?
b. What is the level and structure of demand for GSM service?
c. How the students rank the four GSM services?

1.3. Significant of the Study

The importance of the telecommunication sector to the development of a Nation's economy is obvious. Telecommunication facilitates information flows, data processing, income generation as well as a means of securing employment. In view of all these contributions, the studies of the GSM as an aspect of telecommunication industry are important as they provide information to both the consumers, service providers and policy makers within a particular country.

This study also contributes the GSM firms, consumers and the service regulator with information on the size and structure of demand as well as the preference of individual for GSM services, thereby, enhancing their approach on the provision, demand and preference for the service.

Having identified the gap yet to be fill by the literature, the research work will help other researchers who may wish to undertake further research on the area or similar topic. In general, the study will be beneficial to the general public, as it will contribute to the scope of knowledge on the topic

1.4. Limitation of the Study

This study has reported an empirical analysis of demand for GSM services: a case of students of ABU, zaria-Nieria. However, one of the limitation of the study is the scope of coverage which is only limited to the students of A.B.U, Zaria. Even though it may be feasible to assume that the insight generated on the preference of the students could be generalise, but much is left on the level of income, environment coverage. Furthermore, the sample size of the country is not considered when it comes to considering the preference of individual in the entire nation that left a research gap to be fill in order to extent the scope of the study.

2. Theoretical Framework

2.1.1. Revealed Preference Model

From the reveal preference perspective, we considered the preference of a student which advocates that student demand that GSM services which he prefers most. In choosing a particular GSM service revealed his preference for that particular service. The revealed preference theory has some assumptions, which an individual predisposes when revealing his preference for a particular GSM service. They include rationality, consistency, transitivity and revealed preference axiom.

It is generally believed that in the revealed preference perspective that an individual customer (student) demands a particular GSM service in order to derive the maximum satisfaction possible. In doing so, an individual consumer considers the axiom of transitivity, consistency in his preference or choice decision.

2.1.2. Demand Analysis

From the demand side perspective, we consider the effect of the price on demand for GSM services. The demand theory advocates that the higher the price of GSM services the lower the demand for GSM services. This means that if the price of GSM services is low, students would demand more of it and at a higher price they would demand less of the GSM services.

It is important therefore, to evaluate demand for GSM services by the student of the Economic Department and see whether the theory has any relevance as regards the demand for GSM services.

2.1.3. Assessment GSM Network

Given our comprehensive understanding of the ordinal theory of demand, we can use the knowledge to assess the four major networks. Empirically, the major determinants of GSM services by the students are the tariff, efficiency of the network, and preference. Therefore, based on our survey we can assume that MTN has the widest coverage and is more efficient than the other networks, followed by V-Mobile, GLO and M-Tel. Since the choice of network is guided by the factors as mentioned above, no rational consumer (student) will prefer or choose M-Tel to others, because it is assumed to be the least efficient among the four major networks. However, the students rank the networks according to the satisfaction they derive each network given their income and market prices of GSM services.

2.2. Empirical Literature

The use of GSM phones in the developing countries, in some cases differ radically from that of the western countries. Developing countries are unique in that phones are seen as a symbol of status and sociability. Yusuf (2003), claim that communication is mostly passive taking the form of receiving calls rather than calling. Phone (GSM) communication is intense during religious holidays in particular and mostly nil for the rest of the day. Nana (2003), also point out that Nigeria has become the fastest growing telecommunication market and one of the biggest in the world, according to a figure by the Nigeria Communication Commission (NCC) telecommunication revenue are reported to have move up from USD 50 million in 1999 to about USD 3.8 billion in 2003 and the demand is still expected to have a positive effect on economic growth.

Moore (2003) regards the GSM penetration in Nigeria much less has been done and more need to be done. According to him the preceding three years the GSM market in Nigeria is the most attractive one in the whole of Africa, and remains a very dynamic market. However, it is realised that there is a large discrepancy between the number of available lines on the ground and the level of market demands. As early as 2001, there were about four million lines but between late 2001 and 2002 the number of lines grows from 10 million to 25 million lines (Communication Africa, 2003). BMT-T research Consultant (2003), claim that the Nigerian telecommunication market represents an untapped potential. The telecommunication infrastructure spending reached a record level of more than USD 1.5 billion in 2003 and cultivate investment is expected to top USD 7.8 billion for the seven years period 2001 through 2008. This is an indication of the high level of demand for the GSM service, which the industry is battling to meet.

Brain (2004), claim that the Nigerian telecommunication market reports highlight that telecommunication opportunities emerging in data, wholesales, provisioning and internet access market sectors are driven by anticipated growth in fixed lines and fixed wireless access (FWA).

2.3. Theoretical Literature

2.3.1. Cardinal Approach to Demand Theory

The ultimate goal of every consumer is to satisfy his needs. This goal lies at the cue of the discussion for goods and services. According to Oyeniyi (1998), demand is the desire to need backed up by the ability, willingness and money to purchase a particular commodity over a specific period of time. Hardwick (1994)

The traditional theory of demand describes behaviour of the consumer. It assumed that the consumer has complete knowledge of all the available commodities, their process and income. There are two basic approaches to the consumer theory: the Cardinality and the Ordinalist approach (Koutshoyanis, 1994)

The cardinalists postulates that utility could be measured in subjective units called utils. The following are some of the assumption of the Cardinalists approach:

a. Rationality: the consumers are rational, which implies that the consumers aim at maximizing his utility subjects to the income constraint and the commodity prices.
b. Cardinalists Utility: the utility of each commodity is measurable using the utils.
c. Constant marginal utility of money: The essential feature of a standard unit of measurement is that it be constant if it changes as income increase or decrease. This means that the measurement rod of utility is elastic
d. Diminishing Marginal Utility: The utility gained from successive unit of a commodity diminishes as the consumer acquired more of that commodity.
e. The total utility of a "basket of good" depends on the quantity of that individual commodity, that is the utility is additive.

2.3.2. The Revealed Preference Theory

The theory of revealed preference is based on the reasonable proposition that the consumer will actually choose to consume that collection of a commodity/good he prefer most. Paul Samuelson introduced the theory in 1938, that the consumer behaved consistently (Hardwick, 1194). The underlined assumptions of the revealed preference are stated:

a. The axiom of rationality: the individual consumer is rational because he prefers more units of commodities than less.
b. The axiom of consistency: if an individual subscriber preferred MTN to V-Moblie, then he cannot prefer V-Mobile to MTN.
c. The axiom of transitivity: if an individual consumer/ subscriber is faced with a decision among four GSM service providers (MTN, V-Mobile, Glo and M-Tel). If he refers MTN to V-Moblie and V-Moblie to Glo and Glo to M-Tel. Then he should prefer MTN to Glo and to M-Tel.
d. The axiom of revealed preference: the consumer by choosing a collection of goodsin any one budget situation reveals his preference for that particular collection of goods/ commodity. The chosen bundle of commodity shows to maximizes the utility (satisfaction) of the consumer.

3. Methodology of Research

3.1. Introduction

Research is an important tool of advancing knowledge for promoting progress and for enabling man to relate effectively to his environment to accomplish his purpose and resolve his conflict. it is the process of arriving at dependable solutions to problems through the planned and systematic collection, analysing and interpretation of data (Osuola, 1993).

3.2. Consumer Surveys

The researcher conducted a survey among the students of the department of economics sample 30 students using interview method. The study showed that 22 (73%) of the respondents believed to have made their preference based on the efficiency, network coverage and tariff charges. The remaining 8 respondents (22%) made their preference based on the factors above in addition to advertisement, mode of acquisition and incentive offered by the operators (i.e., free air time, SMS, validity period and multi-media services e. t. c),

However, on the demand for GSM services, almost all the respondents attributed their demand to income and tariff charges. About 24 (80%) of the respondents revealed that they usually spend more than three weeks without buying a refill card (air time) while only the remaining 6 (20%) of the respondents buy refill card once in a week. Another factor that indicates the effect of price on demand is that the student preferred to make calls at commercial call centers, even though they owned their personal phones.

From the interview, the researcher found that quality of service, network coverage and tariff charges are the major determinants of preference and demand for GSM services by the students. Other factors like advertisement, mode of acquisition of phone and various incentives offered by the operators also contributed. However, the demand for the GSM services is mainly determined by the income level of the students and the tariff charges.

3.3. Population and Sampling Techniques

The total population of the students of economics department is 1300, out of which a sample of 100 questionnaires was administered to the students using a stratified random sampling techniques. The population was divided into strata according to levels (100, 200, 300 and 400 levels). The information obtained from each level was pooled together and obtained a precise estimate of the population.

3.4. Survey Instrument

Questionnaire was used as the survey instrument for the research. The questionnaire was divided into four sections. The first section was an overview of the respondents, which contains information about age, gender, academic level of the respondents. Question one, two and three contained that information.

The second section of the questionnaire contained information about preference for GSM services. This section gave an insight on which GSM services students prefer and why they prefer that particular network. This section includes question four, five eight, nine, eleven, fourteen and seventeen.

The third section of the questionnaire contains information about the expenditure pattern of the students, and it includes question six, seven, ten and twelve. The forth and the last section of the questionnaire tried an assessment of the GSM networks. This section gave an insight on data interpretation, conclusion and recommendation. It includes question thirteen, fifteen, sixteen and eighteen.

3.5. Technique of Data Analysis

The data was analysed using the descriptive statistics such as the frequency. This help in grouping that data into categories. A frequency distribution table would be employed. The non-parametric test, that chi-square is used to test the statistical significant of the result reported in bi-variate table or cross tabulations. This will enable us to ask if any relationship exists between any two variables compared and how strong. A test of statistical significant tells us how confidently we can generalise (i. e, infer) unmeasured population parameter from the sample of that population by comparing observed and expected frequencies and rejecting or accepting either the null hypothesis (H_O) or the alternative hypothesis (H_1).

The variables that are relevant to the research question are efficiency of network, tariff, preference and demand will be cross-tabulated and summarised. Their Pearson Chi-Square value ($\chi 2$) will also be determined and compared to the tabulated or critical values. If calculated $\chi 2$ exceed tabulated $\chi 2$ we can reject the null hypothesis, otherwise, we reject it. All data are primary and were sourced by questionnaire survey, 2005.

Chi-Square Formula ($\chi 2$) is given as:

$$\frac{}{Et} \quad X^2 1=\sum_{T=1}(Qt-Et)^2 \quad \text{---------- (1)}$$

Where:

Qt = is the observed frequency ---------- (2)

Et = is the expected frequency ---------- (3)

$\chi 2$ = is the chi-square and is the measure of discrepancy between the observed and expected values. If there is no discrepancy, then $\chi 2 = 0$ ---------- (4)

D. F = Degree of Freedom = (R-1) (C-1) ---------- (5)

R = Row ---------- (6)

C = Column ---------- (7)

For each cell, we calculated $\chi 2$ and the sum total for $\chi 2$ value.

To get the expected frequency of each cell:

$$\frac{\text{(Column Total) (Row Total)}}{\text{Grand Total}} \quad \text{---------- (8)}$$

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As the discrepancy become large, chi-square also becomes large. Given the following observed frequency the expected frequency can be calculated as:

	I	**II**	**Total**
I	**α**	**α**	**N_α**
II	**β_1**	**β_2**	**N_β**
Total	**N_1**	**N_2**	**N**

Table 1: Chi-square table: Observed Frequency Values
Source: Author's Computation

	I	**II**	**Total**
I	**$\frac{N1 \times N\alpha 1}{N}$**	**$\frac{N2 \times N\beta 2}{N}$**	**Nα**
II	**$\frac{N1 \times N\beta 1}{N}$**	**$\frac{N2 \times N\beta 2}{N}$**	**Nβ**
Total	**N1**	**N2**	**N**

Table 2: Contingency table: Expected Frequency Values
Source: Author's Computation

The table of chi-square is calculated by checking the value on the chi-square where the contingency interval (0.95) on the columns intersects the degree (v) on the row. The confidence interval or level of significant, the is 0.5% shows that the probability of making an error in generalizing population values from sample values in 5 out of 100.

3.7. Hypothesis Formulation

For this study to be result oriented and to stand the test of time three hypothesis is formulated and tested. In testing the hypothesis the research use the principle of alternative hypothesis (H1) and the null hypothesis (Ho). If H1 is rejected it implies that Ho will be accepted and if H1 is accepted it implies that H0 will be rejected.

3.7.1. Hypothesis One

H0: $\alpha = 0$; there is no relationship between network efficiency and preference.
H1: $\alpha \neq 0$; there is a relationship between network efficiency and preference.

3.7.2. Hypothesis Two

H0: $\alpha = 0$; there is no relationship between GSM tariff and demand for GSM services.
H1: $\alpha \neq 0$; there is relationship between GSM tariff and demand for GSM services.

3.7.3. Hypothesis Three

H0: $\alpha = 0$; efficiency of network does not determine how students rank the network.
H1: $\alpha \neq 0$; efficiency of network determines how students rank the network.

4. Result and Discussions

4.1. Result and Discussions

Out of 94 questionnaire administered about 82 or 87.2% of the students said they subscribed to GSM services. While on 12 or 12.8% did not. It can be seen that majority of the students subscribe to GSM services. A question was also asked as to "which of the GSM services they subscribe to". About 54.3% or 54 of the students said they subscribe to MTN. 17.0% or 16 students to V-Mobile, while 8.5% or 8 students to GLO and about 7.5% or 7 students subscribed to M-Tel, MTN/V-Mobile or MTN/GLO.

Students were also asked "if any network reduces its tariff charges, would they shift" about 44.7% or 42 of the students confirmed that they would not shift to other network regardless of whether there is downward review of the tariff in those network. 38.3% or 36 students on the contrary said they would shift to other network if there is downward review of the price. The result shows that majority of the students remained with their preferred network regardless of change in tariff due to network efficiency. This shows that quality and efficiency of network is the major determinant of demand for GSM services by the student not downward review of tariff.

4.2. Implications of Findings

4.2.1. Hypothesis Testing: One

H0: $\alpha = 0$; there is no relationship between network efficiency and preference.
H1: $\alpha \neq 0$; there is a relationship between network efficiency and preference.

The above hypothesis was tested by selecting research following question:
Question 5: which of the GSM services do you subscribe to?
Question 15: which of the network is more reliable?
By comparing the questions in a cross tabulation format (i.e. efficiency and preference) the following result was obtained.

Calculated $\chi 2$ value = 39.91 at D. F at 5% level of significance
Tabulated $\chi 2$ value = 36.4
Therefore, since the calculated $\chi 2$ is greater than the tabulated, we reject Ho and agree that efficiency of network will lead to preference of a particular network

4.2.2. Hypothesis Testing: Two

H0: $\alpha = 0$; there is no relationship between GSM tariff and demand for GSM services.
H1: $\alpha \neq 0$; there is relationship between GSM tariff and demand for GSM services.

The above hypothesis was tested by selecting the following questions:
Question 6: how often do make calls?
Question 15: How much are you charge per minute?
As usual, we compared the variables in question 6 and 15 in a cross tabulation (i.e. demand for GSM and tariff). Tariff is the independent variable while demand is the dependent variable. The following result was obtained for the $\chi 2$ cross tabulation:

Calculated $\chi 2$ value = 18.69 at 18 D. F and 5% level of significance
Tabulated $\chi 2$ value = 16.5
Calculated $\chi 2$ is greater than tabulated $\chi 2$; we therefore, accept Ho and conclude that GSM tariff is not the major determinant of demand for GSM services among the students. Instead efficiency of the network if the key determinants, that is to say those students are more interested in the value for their money.

4.2.3. Hypothesis Testing: Three
H0: $\alpha = 0$; efficiency of network does not determine how students rank the network.
H1: $\alpha \neq 0$; efficiency of network determines how students rank the network.

The above hypothesis was tested by comparing question 4 and 15 (i.e. subscription and efficiency) in across tabulated format. Network efficiency is the independent variable while subscription is the dependent variable. The following result was obtained from the:

Calculated $\chi 2$ value = 21.23 at 4 D. F and 5% level of significance
Tabulated $\chi 2$ value = 9.49
The calculated $\chi 2$ is greater than the tabulated $\chi 2$; on that bases, we therefore, reject Ho and accept H1 that network efficiency determined how students rank a network.

4.3. Summary of the Findings
In summary, efficiency, preference and price has been cited as the causes of demand for GSM services by the students of the department of economics. Except for the price which does not conform to the demand theory, efficiency and preference conform to the revealed preference theory. This is to say that price is not really a major determinant of the demand for GSM services among the students, but rather efficiency of the network and choice or preference of the students.
We can infer that majority of the students subscribed to MTN due to its network efficiency. If other networks can improve their services they could attract more subscribers to their network. The data presented clearly supported the posited hypothesis on the positive link between preference, efficiency and the demand for GSM services by the students of Economics Department, A. B. U. Zaria, except for the price which does not affects the demand for GSM services.

5. Conclusion and Policy Recommendation

5.1. Conclusion
On the basis of the above exposition, we can have been able to find out that price or tariff does not form core of the determinant of the demand for GSM services by the students. This finding invalidates the demand theory, which says that price is the major determinant of demand. However, contrarily in the case of demand for GSM services, the study finds out that efficiency of network is the major yardstick for measuring (determining) the demand for GSM services by the students.
However, the ranking and preference of GSM services by the students is based on the efficiency of the network. The result obtained from the study has shown that the students could prefer and demand for GSM a service that is more efficient and effective.
Conclusively, the study will recommend some policy guidelines that could enhance efficiency and effectiveness of the GSM industry as a whole, if properly implemented.

5.2. Policy Recommendation
This study will not be complete without some realistic policy recommendation necessary to transform into reality the expected performance of the GSM services providers in the country.
We hereby propose a few recommendations whose implementation will go a long way in ensuring effectiveness of the GSM services and ensuring a better and improved the performance of GSM services in the country. Some of these recommendations are:
By popular opinion and experience from the data source, improved facilities and services in terms of facilities enhancement and technology advancement in the industry would go a long way in improving efficiency and effectiveness of GSM service thereby increase the demand.
The GSM service providers should have an agreement between them so as to install facilities that would ensure adequate inter-connectivity and free access to other networks.
The GSM service providers should reduce their tariff charges so as to provide surplus which would consequently leads to consumers' welfare while increasing their loyalty to the service providers.
There should be wider network coverage to more areas which would further ensure consumers' satisfaction and welfare as such more demand for the service.
The government should increase the number of the firms in the industry, so as to provide competition among the service providers. This would further increase choice of the service and competiveness in the industry, thereby, improves the demand in the industry.
The Nigerian Communication Commission (NCC) should be more vigilant in enforcing the relevant laws that would motivate the GSM providers more effective in term of service provision, thereby, installing confidence on the part of the consumers on the guarantee of the service providers.

6. References

i. Aijaz, S. (2002), "Vodafone Mobile Phone Award for Innovation and Circularise Knowledge". Online at: http://www.social.yourstory.com/2002/11/vodafone-foundation-awards/
ii. BizTech Africa, (2002), "Emergence of Internet Telephone In Nigeria". Online at: http://www.biztech.com/Country/Nigeria
iii. Bola, O. (2002), "Nigerian Telecom Heap Forward". Journal Communication Africa. April/ May.
iv. Bola, O. (2004), "The Promise of Investment in Nigeria" Journal Of Communication Africa. June/ July.
v. Bradley, R. S. (1991), "The Economy Today". 5th Edition, R. R Donnelley and Sons. America.
vi. Brian, N. (2004), "Opportunity in Africa". Journal of Communication Africa. June/July.
vii. Budde Comm (2003). "Nigeria- Mobile Infrastruction, operation and Broadband-statistic and Analysis". Online at:http://www.budde.com.au/Research?nigeria-mobile-Infrastructure-operation-Statistics-and-Analyses.html
viii. Communication Africa, (2002), "Adoption Rate of GSM in Nigeria". Online at: http://www.communicationsafrica.com/
ix. Daniel, M. H. (1992), "Revealed Preference and Utility Theory". Online at: http://shoollib.vt.edu/thesis/available/etb-2108/unrestricted/chapter2-4PDE.
x. Jhingan, M. C. (2001), "Advanced Economic Theory". 4th Edition, Varinda. Delhi.
xi. Koutsoyannis, A. (1979), "Modern Microeconomics". 2nd Edition, Macmillan, London.
xii. Koutsoyannis, A. (1979), "Theory of Econometrics". Macmillan, Hamshire, London.
xiii. Lapin, L. L. (1978), "Statistics for Modern Business Decisions". 2nd Edition, Vantage Art, Inc. New York, USA.
xiv. Moore, E. G. (2003), "Future-Computes and Telecommunication". Dan David Foundation, USA. Online at: www.http://www.dandavidprize.org/laureates/203/92-future-computer-and-telecommunication/199-gordon-e-moore.
xv. Nana Development Corporation. (2003), "IT and Telecom". Online at: http://www.nana-dev.com/services/it_and _telecom/
xvi. Nigerian Business Information (2003), "Revisiting Nigeria's Telecommunication Industry". On line at: http://www.nigeriabusinessinfo.com/com/telecoms080903.htm
xvii. Nigerian Business Information, (2003), "GSM and Time Management". Online at http://www.nigeriaexport.com/news/nig_businfo.html
xviii. Nigerian Telecommunication Commission (2003), "Nigeria Recorded 110.3 Million Active Subscribers: A History of GSN in Nigeria". On line at:http://www.ncc.gov.ng/index.php?option=com_content&view=article&id+125ltemid=73
xix. Nigerian Telecommunication Commission, (1999), "Telecommunication in Nigeria". Online at: http://www.1stattorneys.com/hdesk/knowledgebase.php=3.
xx. Osuola, E. O. (1977), "Introduction to the Research Methodology". 2nd Edition, FEP. Nigeria.
xxi. Oyeniyi, T. A. (1998), "Microeconomics". 2nd Edition, Onisha. Nigeria.
xxii. Peter, G. (2004), "Looking at the Next Generation". Communication Africa. Sept/March.
xxiii. Wagner, L. (1973), "Reading in Applied Macroeconomics"
xxiv. Yusuf, Z and Abdullah, K. (2003). "Use of Cellular Phones in Turkey". European Journal of Communication. 18(2), P241-254.hardwick, P. (1994). "