Advances In Multidisciplinary & Scientific Research
A Multidisciplinary & Interdisciplinary Journal

Vol. 1, No. 2, September, 2015

The Status and Implementation of Mobile Number Portability in Nigeria: Stakeholders' Views

***Amoo, S. A.**
Department of Mathematics and Statistics,
Federal University Wukari, Taraba
amoo@fuwukari.edu.ng, drsikiruamoo@gmail.com
Phone: +2348033136338

Hambali, M.A.
Department of Computer Science,
Federal University Wukari, Taraba
hambali@fuwukari.edu.ng
Phone: +2348058562994

*Corresponding author

ABSTRACT

Mobile Number Portability is a mobile phone service that enables phone users to change operator at ease without losing their contact numbers. It enables mobile telephone users to retain their mobile telephone numbers when changing from one mobile network to another. A non-experimental study was carried out in 10 selected Local Government areas in Lagos State. The study population comprised the active mobile users of the four major network service providers (that is, MTN, Globacom, Airtel and Etisalat). The GSM subscribers of about 200 were randomly selected and these populations include both male and female; low education background users and highly educated user. The study found out the opinion of GSM user on the status of GSM services, cost rates and the advantages of implementation of MNP in Nigerian GSM Networks. The study made use of 55% and 45% of male and female subscribers participated in the survey respectively. Therefore, the response of GSM subscribers indicate the readiness of Nigerians to the implementation of MNP in Nigeria mobile communication because of the benefits that will be brought to the GSM users such as good quality of services from network operators, reduction in cost rates, the subscribers will have choice of network operators at will in as much as terms and conditions apply.

Keywords: Implementation, Portability, GSM, Mobile Network, Mobile Service Provider, MNP.

Aims Research Journal Reference Format:
Amoo, S.A. & Hambali, M.A. (2015): The Status and Implementation of Mobile Number Portability in Nigeria: Stakeholders' Views. Advances in Multidisciplinary Research Journal. Vol 1, No. 2 Pp 169-180.

1. BACKGROUND TO THE STUDY

The mobile communication plays a major role in telecommunication industry. Mobile network falls under the service sector, which is experiencing a rapid development which in turn is supporting economic growth in Nigerian economy. The most challenging job for present day for network providers is retaining their customers. Driven by various policy initiatives, Nigerian's telecom sector has witnessed a major transformation during the last decade. It has achieved a phenomenal growth during the last few years and is poised to take a big leap in the future also to improve competition and ensure high customer satisfaction in the telecommunication networks in Nigeria. Poor Quality of Service (QoS) and high call rates has become a serious issue in the telecommunications business in Nigeria and forcing subscribers to be in possession of multiple lines (Nation, 2011). Some subscribers have as many as four/five 'lines' –GSM and CDMA inclusive. Based on report from NCC (Nigerian Communication Commission), there are about 120 million connected lines in Nigeria; only about 90 million are active. Omo-Ettu the president of the Association of Telecommunications Companies of Nigeria (ATCON), believes that Nigeria does not have more than 30 million genuine subscribers.

What makes the situation worrisome is that some operators seem unconcerned about the plight of their subscribers, because they believe that subscriber may find it difficult to switch from their network due to some inconvenience of having to give out a new number to their contacts (NCC, 2011).

The objective of NCC is to protect consumer interest through the development, monitoring and enforcement of compliance with regulations by Telecommunication service providers in order to ensure better quality services, fair pricing and competition, and in line with provisions of section 128 of Nigerian Communication Act (NCA, 2003) which vests NCC with the exclusive right to regulate numbers and number portability in Nigeria, the commission has announced the commencement of Mobile Number Portability (MNP) implementation in Nigeria telecommunication network as far back as June 2012 (NCC, 2012). Mobile Network Portability (MNP) is very significant concept because it addresses most of the challenges faced by subscribers. There are so many benefits which MNP comes with, ranging from enabling subscribers to preserve their numbers while switching to a different mobile network to bringing about competition, consumer choice and ultimately reduces switching costs. Switching cost does not refer to the amount paid to switch to another operator but it includes the cost of changing numbers on business cards, notifying family members, repainting business vans because of changed numbers, etc.

1.1 General Overview

There are difference implementations of MNP across the globe. The international and European standard of implementing MNP is for a customer wishing to port his/her number to contact the new network operator (Recipient), which then sends the Number Portability Request (NPR) to the current network operator (Donor). The customer that wishes to port his/her number is required to contact the Donor to obtain a Porting Authorization Code (PAC), which is then presented to the Recipient network for processing and activating his/her number on the recipient network. Once having received the PAC, the Recipient continues the port process by contacting the Donor. This form of porting is known as Donor-Led.

Another implementation of MNP is via the use of Central Database (CDB) of ported numbers. Network operator makes copies of CDB and queries it to find out which network to send a call to. This is also known as **All Call Query** (ACQ) and is highly efficient and scalable. Majority of the implemented and upcoming MNP systems across the world are based on this ACQ/CBD method of call routing. One of the countries that are not use ACQ/CDB is United Kingdom where MNP is implemented based on Donor-led. This is also known as Indirect Routing and is highly inefficient as it is wasteful of transmission and switching capacity. In a decentralized model of MNP, a Flexible Number Register (FNR) may be used to manage a database of ported numbers for call routing.

1.2 Literature Review

So far, there is no single theory emerged to explain competition in mobile telecommunications and to analyze possible outcomes of implementation of Mobile Number Portability (Yuriy, 2006). But there are advances of theory in some tightly related areas which provide the necessary framework to analyze the problem through. There are few theoretical papers concerned the problem of MNP implementation directly. All these papers developed from the framework of network competition, as provided by Armstrong (1998) and Laffont et al., (1998), with addition of switching costs to the model. Aoki and Small (2005) is the most popular cited paper that directly investigates the effect of MNP implementation. This work presented the interpretation of MNP as a reduction in switching costs accompanied by increase in fixed and marginal costs of the firms. Their analytical investigation is focused on consumers and producers welfares. The model is not conveniently analysis the competition among the firms, because authors focus on entry of a second firm to a market previously monopolized by incumbent service provider. Authors assume positive and significant switching costs of consumers and two-part tariff pricing by both firms. They found that on a mature market MNP leads to completely different welfare outcomes, depending on relative sizes of switching costs, “transportation cost” and consumer valuations.

Buehler and Haucap (2004) also investigated the effect on MNP implementation on consumers’ welfare. Novelty of this research was consideration of the effect of MNP on level of information available to consumers. They argue that under MNP number prefix has no indicative power. Callers are not able to distinguish between on-network and off-network phone numbers and may end up paying higher average bills. They also argue that MNP implementation will benefit entrant firm and will hurt incumbent. The authors concentrate on the analysis of fixed-to-mobile calls ignoring more difficult mobile-to-mobile case, which involves changes of market shares.

Shi, Chiang and Rhee (2002) found that when networks incur interconnection costs, MNP may lead to higher market concentration. Their paper was motivated by increased concentration on the Hong Kong mobile telecommunications market. They argue that if there are large on-network discounts on a market, reduced switching costs, after MNP implementation, it could make on-network discounts of the larger firm more attractive for consumers of the small firm and result in higher switching of the later. Shi, Chiang and Rhee (2002) do not solve the problem with new consumers on the market, but make logical conclusion that the less competitive outcome is also possible, though with new consumers equilibrium market prices are expected to decrease. The paper also assumes two-part tariff pricing scheme resulting in per minute prices being equal to marginal cost of providing one minute of the service.

In the context of services, switching refers to replacing the current service provider with another. Keaveney and Parthasarathy (2001) defined switching more clearly as "… where customers continue to use the service category (e.g., online service) but switch from one service provider (e.g., MTN) to another (e.g., Etisalat)". On the contrary, another stream of research has defined service switching by regarding the attitudinal component as 'switching intention' (Anton, 2007; Lin, 2010; Shin and Kim, 2008). Farrell and Klemperer (2004) provided broad review and classification of all available literature and findings related to switching costs. The paper provides analysis of practically all situations where switching costs arise and do have an effect. They approached the conventionally controversial issue of whether switching costs attract or distract entry. The authors suggested that resolution would depend upon the size of the switching, costs, the scale of entry, market dynamics, and existence of economies of scale. They also analyzed the competition strategy called penetration pricing, when firm gives up present periods profits to build-up market share and receive higher profits in the future.

Many experts and scholars have presented their opinions on the concept of mobile number portability in a variety of ways. Humport (2008) defined mobile number portability as a process that permits a mobile phone subscriber to keep his or her mobile phone and number when he moves from one service provider to another. To Yengurk (2003), mobile number portability is the process of enabling a mobile subscriber to move from a network operator to another network operator without changing his or her mobile number. The concept simply means that a subscriber can retain the whole mobile number. Various stakeholders in the mobile telecommunication industry have viewed Mobile number portability as an essential policy framework necessary to ensure competition and to protect new entrants into the industry (Lyons, 2006). The motive of providing a consumer with the freedom to move freely between service providers and to ensure healthy competition in the mobile industry has always been the benchmark for regulators to promote mobile number portability (Reinke, 1998 and Lyons, 2006).

It must be emphasized that the implementation of mobile number portability does not automatically bring competition in the mobile market (Shin, 2006). It is a facility that leads to; better service quality, reduction in prices, etc. because of the apparent desire to lure more customers, put intense pressure on them to offer a more competitive product to their customers (Park, 2009). For operational purposes, this study defined mobile number portability as a system that facilitates mobile phone users to switch over mobile network operators without changing their personal number and codes. Although there have been many studies looking at the effect of number portability on competition at the industry level, across the globe, little attention has been shown on the individual level such as subscribers' behaviour or perceptions as in this study

2. STATEMENT OF PROBLEM

There are various concepts and perception of subscribers or stakeholders in MNP across the globe. Although there have been many studies looking at the effect of number portability on competition at the industry level, across the globe, little attention has been shown on the individual level such as subscribers' behaviour or perceptions as in this study. The study therefore, sought to examine, the convenience and effectiveness of implementation of MNP among GSM communications in Nigeria. In order to achieve it, the study analyses the view of the stakeholders vis-a-vis GSM services, cost rate and implementation of MNP.

2.1 Research Questions

To achieve the objectives of this study, the following questions raised were answered:

1. What is the profile of the respondents to the study?
2. What are the respondents' opinion on the status of GSM services and cost rates in Nigeria.
3. What are the respondents' opinions on the implementation of MNP in Nigeria GSM network?

3. OBJECTIVES

The main objectives of the paper are to determine the views of the stakeholders as well as to determine the their status and implementation of MNP

4. METHODOLOGY

In order to achieve the status and implementation of MNP the subscribers' in Nigeria and to identify the factors that determine the network switching behaviour of mobile subscribers. In line with this, (Dix, Finlay, Abowd, & Beale, 1998) states that the best way to find out how a system meets users requirement and expectation is to ask the users their views on the effects of Mobile Number Portability. This survey uses the questionnaires techniques to obtain information from the respondents.

However, the use of questionnaires is an inexpensive way to gather data from potentially large number of respondents. The use of questionnaires is feasible way to reach quite a number of reviewers large enough to allow statistical analysis of the results. A simple purposive survey was used in study the researcher concentrated on the impact of MNP on subscribers' behaviours and perceptions in Lagos State, Nigeria. This study is based on primary data. The survey method which was employed in gathering information from respondents consists of direct visitation, observation and questionnaires.

4.1 Population of the Study

The study population comprised the active mobile users of the four major network operators (MTN, Globacom, Airtel and Etisalat). A structured questionnaire was used to gather data from GSM subscribers in 10 local governments out of the 20 local governments in Lagos state. The subscribers are purposively and randomly selected from each of the local government.

4.2 Scope/delimitation of the study

The study was carried out based on limit of available resources; therefore the study was delimited to the following:

1) Four major network providers (MTN, Globacom, Airtel and Etisalat) were considering for the study.
2) Voice service only.
3) GSM users only.
4) Gender based
5) Subscribers being literate and earning some money in a structured environment.

5. DATA PRESENTATION

The sample of 200 GSM subscribers was taken from MTN, Globacom, Airtel and Etisalate; from 10 local governments.

Table 1: List of Local Governments GSM Subscribers Sample

S/N	Name of Local Government	Male	Female
1	Agege local government	10	10
2	Apapa local government	10	5
3	Epe local government	10	10
4	Eti Osa local government	10	10
5	Ikeja local government	10	10
6	Ikorodu local government	10	10
7	Lagos Island local government	10	10
8	Lagos Mainland local government	15	10
9	Mushin local government	15	5
10	Surulere local government	10	10

5.1 Instrumentation

As the study was descriptive in nature, the questionnaires have three sections used to collect data from the GSM subscribers. The first section consist of six items which related to the respondents bio data such as sex, marital status, age, etc. The second section contain four items regarding the opinions of the respondents on status of GSM services and rates in Nigeria and the last section consists of seven items seeking the opinion of GSM subscribers on MNP implementation and expected outcome in Nigeria.

5.2 Method of Data collection

In order to get data from the respondents, the researchers visited the sampled local government personally and administered the questionnaires to the sample mobile users. They were thoroughly briefed about the procedure of filling the questionnaire.

5.3 Method of Data Analysis

Data collected were tabulated, analysed and interpreted in the light of the objectives of the study. One open-ended question was included to capture other comments the subscriber may have on the subject. The data collected was analysed using mainly frequency counts and percentage distributions.

6. DISCUSSION OF FINDINGS

The study investigated MNP implementation in Nigeria using GSM network as a tool to improve quality of network service, reduction of call rates and best market competitiveness. The data collected through research instrument were tabulated, analysed and interpreted in the light of the objective of the study. The result of the analysis and findings presented as follow:

Research Question 1: What is the profile of the respondents to the study?
In order to answer Research Question 1, Tables 2 to 6 present the result.

Table 2: Respondent Gender Distribution.

Gender	Frequency	Percentage (%)
Male	110	55
Female	90	45
Total	200	100

Table 2 reveals that male = 110, female = 90 and this represents 55% and 45% of male and female participation in the survey respectively. The outcome of the gender distribution of the participants is presented in Figure 1.

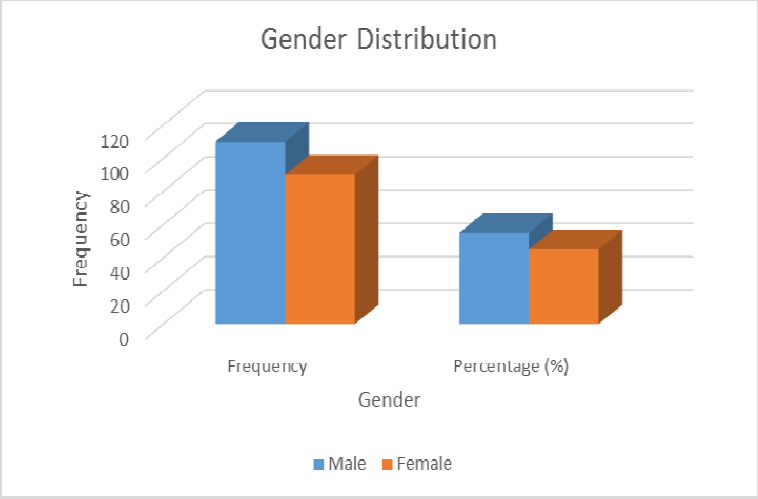


Figure 1: Gender Distribution

Table 3: Respondent Educational Background

Educational background	Frequency	Percentage (%)
Primary	20	10
Secondary	70	35
Diploma	9	4.5
Degree	101	50.5
Total	200	100

Table 3 represents the respondents' educational background, since this study was a survey of local government personnel, these people are categorised 10% for the first school leaving certificate holders, 35% represents secondary school certificate holder, 4.5% as Diploma holders and 50.5% are first Degree holders

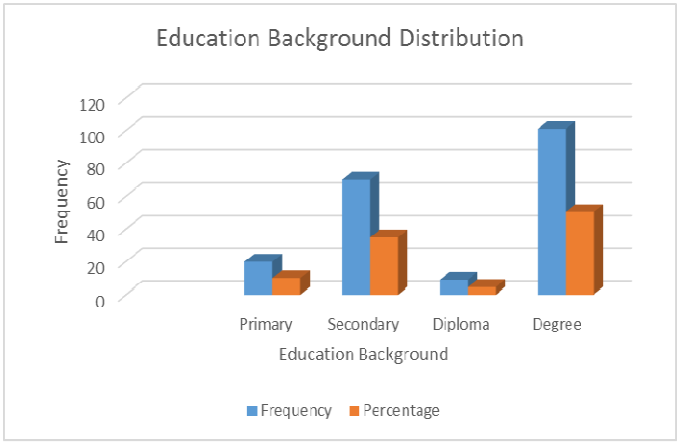


Figure 2: Educational Bacground Distribution

Table 4: Respondents' Marital Status Distribution

Marital status	Frequency	Percentage (%)
Unmarried	105	52.5
Married	37	18.5
Engaged in a partner	50	25
Divorced	8	4
Total	200	100

Table 4 is a field survey that represents the marital distributions. 52.5% are unmarried, 18.5% are married, 25% are awaiting to be married while 4% of them are divorced. The graphical distribution is in figure 3

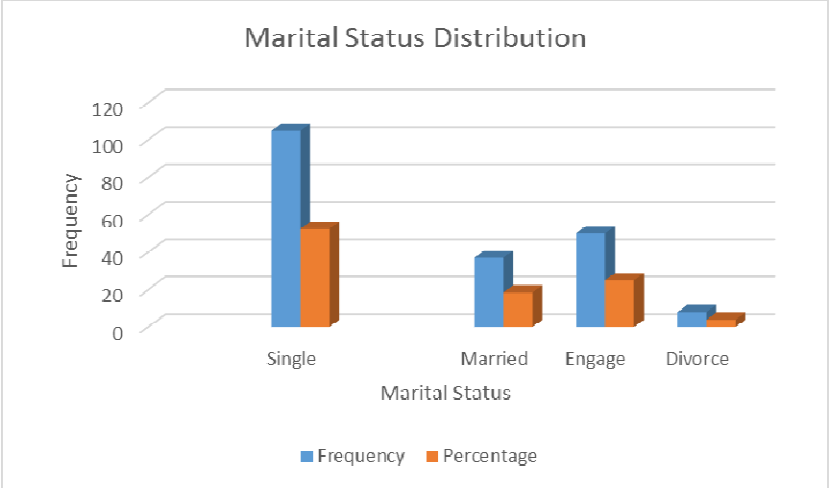


Fig. 3: Marital Status Distribution

Table 5: Respondents' Monthly Income Distribution

Monthly Income	Frequency	Percentage (%)
Below ₦15,000	15	7.5
₦15,000 - ₦35,000	100	50
₦36,000 - ₦55,000	50	25
₦56,000 - ₦70,000	30	15
₦71,000 and above	5	2.5
Total	200	100

Table 5 is Respondents' Monthly Income Distribution as can be inferred that 7.5% collect below ₦15,000 after tax and other statutory deductions, 50% collects at least ₦15,000 and at most ₦35,000 monthly, 25 % collect at least ₦36,000 and at most ₦55,000 monthly, 15 % of the people sampled take home at least ₦56,000 and at most ₦70,000 every month and 2.5% of the respondents earn at least ₦71,000 and above. The graphical representation is in figure 4

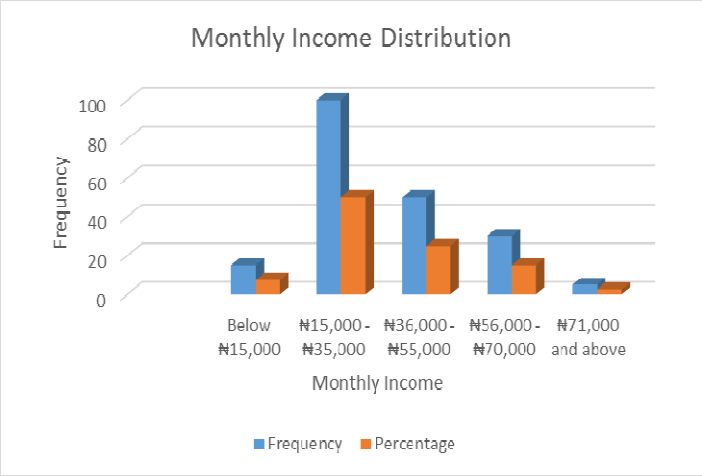


Figure 4: Monthly Income Distribution

Table 6 : Respondents' Years of GSM Usage Distribution

Years of GSM Usage	Frequency	Percentage (%)
0 - 3yrs	10	5
4 - 6yrs	30	15
7 - 9yrs	110	55
10yrs and above	50	25
Total	200	100

Table 6 shows the respondents' years of GSM usage distribution. This is includes 5% of less than 3 years usage, 15% represents between 4 and 6 years usage, 55% of them have used GSM between 7 and 9 years inclusively and 25% of the respondents have used the GSM for more than 10 years. The graphical representation of this distribution parameter is shown in figure 5

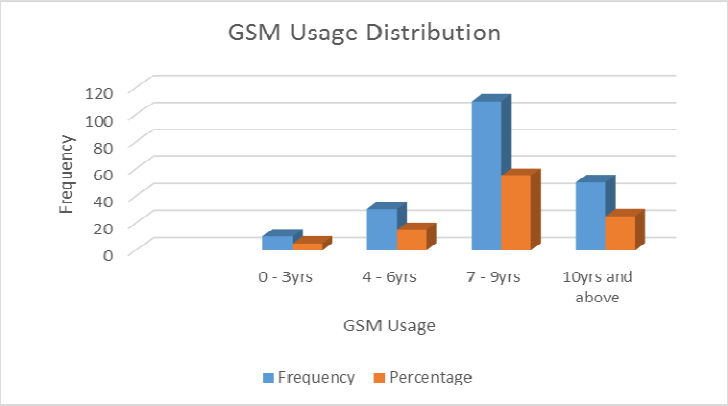


Fig. 5: GSM Usage Distribution

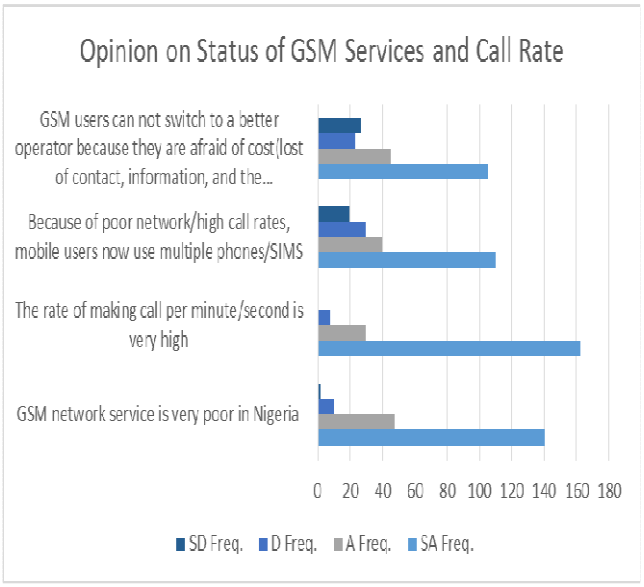
Research Question 2: What are you opinions on the status of GSM services and rates in Nigeria?
In order to answer Research Question 2, Table 7 presents the result

Note: SA = Strongly Agree A = Agree
SD = Strongly Disagree D = Disagree

Table 7: Opinion on the Status of GSM Services and Call Rates in Nigeria

S/N	Statement	SA		A		D		SD	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
1.	GSM network service is very poor in Nigeria	140	70	48	24	10	0.05	2	0.01
2.	The rate of making call per minute/second is very high	162	81	30	15	8	0.04	0	0
3.	Because of poor network/high call rates, mobile users now use multiple phones/SIMS	110	55	40	20	30	15	20	10
4.	GSM users can not switch to a better operator because they are afraid of cost(lost of contact, information, and the inconvenience)	105	52.5	45	22.5	23	11.5	27	13.5

Table 7 presents the respondents opinion on the Status of GSM Services and Call Rates in Nigeria. 94% supports that GSM service has been poor in terms of service while 6% suggests that the network operations are not poor. The choice of this depends on the income and what they use the GSM to do. 96% of the field survey reveals that the rate of making calls per second is high for the users and 4% disagree with the opinion. 75% are multiple phone users while 25% disagree with the idea of multiple phone/SIM. 75% is afraid of switching while 25 % are not and by implications, the respondents' opinion suggests that they might lose their customers if they have to switch to other operators thereby losing their customers. The graphical representation of this respondents' opinion distribution is shown in figure 6



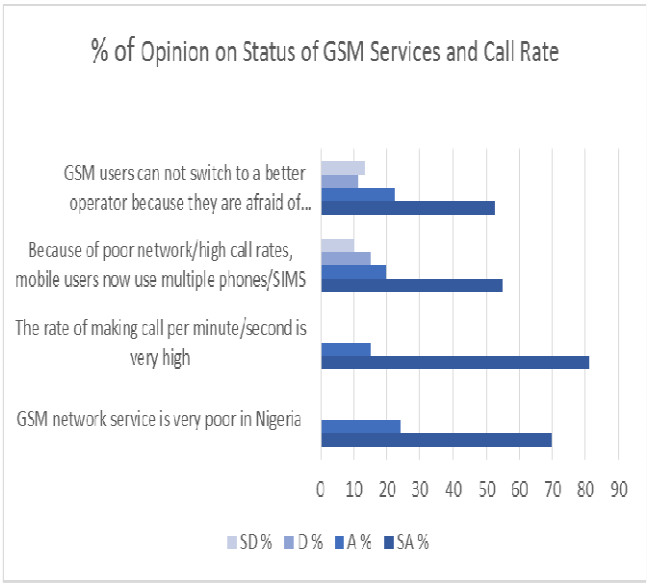


Fig. 6: Opionion on Status of GSM Service and Call Rate in Nigeria

Research Question 3: What are your opinions on the implementation of MNP in GSM network in Nigeria?
In order to answer Research Question 3, Table 8 presents the result.

Note: SA = Strongly Agree A = Agree
SD = Strongly Disagree D = Disagree

Table 8: opinions on the implementation of MNP in GSM network in Nigeria.

S/N	Statement	SA		A		D		SD	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
1.	The Nigerian mobile users are not familiar with mobile number portability (MNP)	105	52.5	30	15	13	6.5	52	26
2.	I support the implementation of MNP in the GSM network	121	60.5	37	18.5	23	11.5	19	9.5
3.	The implementation of MNP will be successful in Nigeria telecom industry.	95	47.5	60	30	33	16.5	12	6
4.	The MNP will improve quality of network services	100	50	55	27.5	40	20	5	2.5
5.	MNP will bring down the call rates	133	66.5	60	30	7	3.5	20	10
6.	MNP mobile users will now have a freedom to switch from one operator to better one	123	61.5	70	35	9	4.5	8	4
7.	The MNP will improve competitive among operators.	106	53	56	28	20	10	18	9

Table 8 reveals the opinions on the implementation of MNP in GSM network in Nigeria. 67.5% are not familiar with the MNP while 32.5% are familiar. 79% of the respondents however support the implementation of the MNP while 21% disagree. 80.5% support that MNP will improve the telecom industry while 91.5% fail to support MNP as panacea to telecom industry. 77.5% opine that MNP will improve the quality of network services while 22.5% disagree with the opinion. 96.5% opine that MNP will regulate he call rates while 3.5% has different opinion. 96.5% believe that switching to other operator will alleviate the problem of carrying multiple SIMS/Phones since it is going to be free to switch at will while 3.5% share different opinion. 81% agree that MNP will improve competitive rivalry among the GSM operators while 19% disagree with the opinion. The graphical representation of this respondents' opinion distribution is depicted in figure 7.

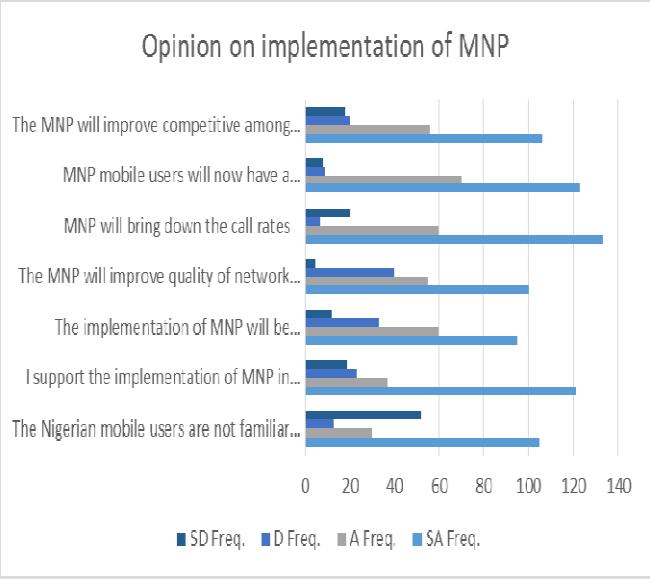


Fig. 7(a): Opinion on Implemetation of MNP among Users in Nigeria

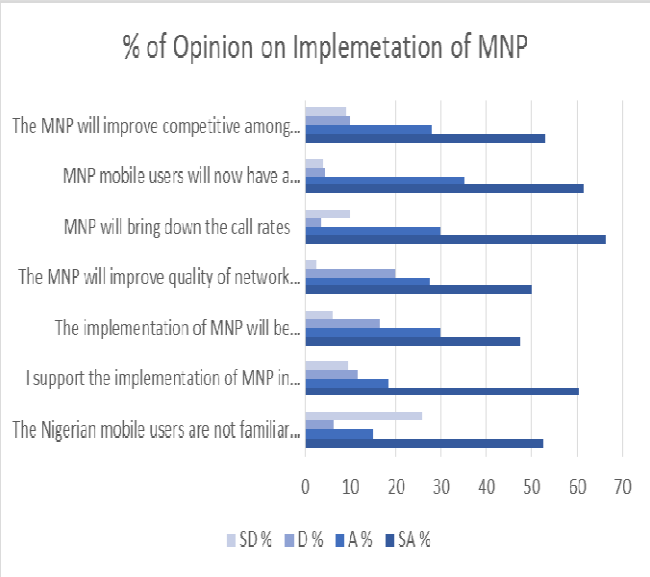


Fig. 7(b): Opinion on Implemetation of MNP among Users in Nigeria

7. CONCLUDING REMARKS

The study found out the opinion of GSM users on the status of GSM services, cost rates and the advantages of implementation of MNP in Nigerian GSM Networks. Therefore, the response of GSM subscribers indicate the readiness of Nigerians to the implementation of MNP in Nigeria mobile communication because of the benefits that will be brought to the GSM users such as good quality of services from network operators, reduction in cost rates, the subscribers will have choice of network operators at will in as much as terms and conditions apply
In conclusion, the subscribers, despite their fear on the MNP, they all agree that the MNP will improve the Nigerian economy; there would be rivalry competition among the service providers.

8. CONTRIBUTIONS TO KNOWLEDGE

The major contributions in this study have been creating awareness of MNP among the multiple use of GSM/SIM. That MNP can create and regulate the pricing of the service providers as well as the opportunity to improve their services

REFERENCES

1. Amoo S. A. & Hambali M. A (2015). The Status and Implementation of Mobile Number Portability in Nigeria:Stakeholders' Views. Multidisciplinary Innovations & Technology Transfer iSTEAMS (MINTT) Conference UNIBEN 2015. Book of Proceedings. Prof. S. C. Chiemeke et al. (Eds), 8, 117 – 128.
2. Anton, U. (2007). The impact of switching costs on the customer satisfaction-loyalty link: Mobile phone service in France. Journal of Services Marketing, 15(1), 35–48.
3. Aoki R. and Small J. (2005). The Economics of Number Portability: Switching Costs and Two Part Tariffs.Working Paper, Institute of Economic Research, Hitotsubashi University.
4. Arellano M. and Bond S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and anApplication to Employment Equations. The Review of Economic Studies 58, Pp 277 -297.
5. Armstrong M. (1998). Network Interconnection in Telecommunications. The Economic Journal, 108 (488).
6. Buehler, S. and Haucap, J. (2004). Mobile Number Portability. Available:http://www.itu.int/ITU-D/finance/work-cost-tariffs/events/tariff-seminars/lithuania-04/hauca
7. Corrocher N. and Zirulia L. (2005). Switching Costs, Consumer's Heterogeneity and Price Discrimination in the Mobile Communications Industry, Working Paper, CESPRI, Bocconi University, Milan.

8. Farrell J., Klemperer P. (2004). Coordination and Lock-In: Competition with Switching Costs and NetworkEffects. Working Paper, Nuffield College, Oxford University.
9. Foster, M., McGarry, T. & Yu, J. (2003). Number Portability in Global Switched Telephone Network (GSTN): An Overview. Available: http:// www.ietf.org.rfc/rfc3482.txt
10. Haiyan, D. Ofori, and Zhu (2013). The research on the effect of mobile subscribers' perception and behavior on Mobile Number Portability (International Conference on Innovation and management Science Paper)
11. Klemperer, P. (1987b). Entry Deterrence in Markets with Consumer Switching Costs. The Economic Journal, 97, 99-117
12. Klemperer, P. (1988). Welfare Effects of Entry into Markets with Switching Costs. The Journal of IndustrialEconomics, 32 (2), pp.159-165.
13. Kumaravel, V. and Kandasamy, C. (2011). Impact of Mobile Number Portability on Mobile usersSwitchover Behaviour – Indian Mobile Market. Journal of Arts, Science & Commerce Pp. 200 – 205 Available: http://www.researchersworld.com/vol2/issue4/paper_23.pdf
14. Laffont J., Rey P., Tirole J. (1998a). Network Competition: I. Overview and Nondiscriminatory Pricing. TheRAND Journal of Economics, 29 (1), pp. 1-37.
15. Lin F. L. (2010). Why customers stay: Measuring the underlying dimensions of services switching costs and managing their differential strategic outcomes. Journal of Business Research, 55, 441–450
16. Lyons H. G. (2006) "Price Competition with Reduced Consumer Switching Costs: The Case of "Wireless Number Portability" in the Cellular Industry." Working Paper, The University of Toronto.
17. Maicas et al., (2009) Mobile Number Portability. Journal of Industry, Competition and Trade 4:3, pp. 223
18. Mbamalu M. (2011). Ghana Beats Nigeria to Mobile Number Portability. The Guardian, July 3, 2011; Pp. 56.
19. National Communication Authority (NCA), Annual Reports 2008 -2011
20. National Communication Authority, "Mobile Number Portability Statistics for 2011.
21. NCC to Introduce Number Portability System after SIM registration (2011). The Guardian June 13, 2011; Pp. 23.
22. Nigerian Communication Commission (2009). Implementation of mobile number Portability in Nigeria: InitialConsultation Paper. February 2, 2009. Available: www.ncc.gov.ng
23. Nigerian Communication Commission (2012). Nigeria Mobile Number Portability: Business Rules & Port Order Processes. Available: www.ncc.gov.ng (accessed March 2012)
24. Nilsson R. T. and Peters N. (2009). Competition when Consumers have Switching Costs: An Overview with Application to Industrial Organization, Macroeconomics, and International Trade," The Review of Economic Studies, Vol. 62, No 4, 515-539
25. Nilsson, C. (2011). "Number Portability For GSM- To GSM Networks In FNR", Ericsson, Internal reference: 4/155 17-ANT 307 01/7
26. Okonedu, B. (2012). NCC Moves to Implement Number Portability. Business Day, June 22, 2012.
27. Omotayo G. H.and Joaching T. (2008),The Advantage of Network Size in Acquiring New Subscribers: a Conditional Logit Analysis of the Korean Mobile Telephony Market, Information Economics and Policy, No 15, 17-33
28. Park R. (2009). A test of services marketing theory: Consumer information acquisition activities. Journal of Marketing, 55, 10–25.
29. Russell E. (2010) "Switching Costs: Annex B – Review of empirical methods for identifying and measuring Switching Costs," Report prepared for the Office of Fair Trading and the Department of Trade and Industry by National Economic Research Associates.
30. Saueborn et al (2008) "The Effect of mobile Number Portability on Switching Costs in the Telecommunication Industry," Working Paper, The University of Wisconsin-Madison.
31. Shi M., Chiang J., Rhee B. (2002). Price Competition with Reduced Consumer Switching Costs: The Case of "Wireless Number Portability" in the Cellular Industry. Working Paper, The University of Toronto.
32. Shin O. (2006) Switching barriers in consumer markets: An investigation of the financial services industry. Journal of Consumer Marketing, 18(4), 323–347.
33. Shin, D. H. (2007). A study of Mobile Number portability Effects in the United States. Telematics and Informatic; Available: http://dl.acm.org/citation.cfm?id=1232051
34. Yuriy Podvysotskiy (2006). An Investigation of the Effect of Mobile Number Portability on MarketCompetition. M. A. Thesis. EERC MA Program in Economics, National University Kyiv Mohyla Academy