



Measuring the Impact of Online Social Networking Sites (SNSs) in the Telecommunication Industry: An Empirical Study of the Republic of Ghana

¹Nana Yaw Asabere, ²John Getor, ³Jacqueline Yaa Asafo-Adjaye

¹DUT, P.R. China / Lecturer, Computer Science Department, Accra Polytechnic, Accra, Ghana

²Transmission Network Design Engineer, Ericsson, Ghana

³Account Manager, Africa Online Ghana Limited, Ghana

ABSTRACT

The proliferation of Online Social Networking Sites (SNSs) has obviously had an impact and influence on the Telecommunication Industry in Ghana and globally as well. Historically, the telecommunication industry has progressed from the days of telegraphs to the current age of mobile devices. Online SNSs have taken the world and by extension Ghana by storm and are in no doubt becoming part and parcel of our everyday life. They are not only used purposely for communication but can also be used for other purposes such as education and finance. The main objective of this research paper is to analyze the extent to which Online SNSs have had an impact on Ghanaian telecommunication market and customers. In order to fulfill this objective and pursue the right information needed for an effective analysis, we adopted qualitative and quantitative research methodologies involving informal interviews and administration of questionnaires to a number of customers in the telecommunication industry of Ghana. Our research study revealed that the introduction of online SNSs through Personal Computers (PCs) has drastically decreased voice communication using mobile devices.

Keywords: *Telecommunication, Communication, Online, Social Networking Sites (SNSs), Internet*

1. INTRODUCTION

Telecommunication is a terminology formed from the combination of two words “Tele” and “Communication”. The word “Tele” in Latin means Distance. Hence Telecommunication is a means of communication at a distance or distance communication [1]. The term telecommunication is broadly defined to include basic traditional telephone services as well as broadband information and communication services that include voice, data services and access to the Internet. Telecommunication usually occurs through signals of varied nature coming from a transmitter to a receiver. In ancient times, the most common way of producing a signal would be through light (fires) and sound (drums and horns).

However, those kinds’ of communications were insecure and certainly left room for improvement as they did not permit message encryption nor a fast transmission of information on a large scale [2]. In 1895, Guillermo Marconi invented the ‘wireless telegraph’ (radio) [2] and after this, different kinds and types of fixed telephone lines and mobile phones/smartphones both analogue and digital, followed in with the telecommunication generation. Telecommunication can occur through wireless systems, satellite communications, fixed wireline systems as well as microwave systems. Telecommunication currently through mobile devices has made life very easy for mankind and has contributed a lot to effective business and individual communication needs in our society.

Twenty years ago in Ghana, it was virtually unheard of to see a household with even a fixed line telephone not to

talk of a personal computer. In the most recent past, computers were devices normally associated with the affluent and people of high academic qualifications working in specialized fields in academia and industry. Nowadays though, computers are very prevalent, even in developing countries like Ghana [3]. In Ghana, expensive portable PCs such as laptops, notebook computers and tablets PCs are owned by affluent individuals, workers and students in both tertiary and secondary levels of education. Today, basic level pupils in Ghana are being given free customized laptops tailored to meet their specific needs.

The Internet is presently becoming an all encompassing communication network that is increasingly becoming an integral part of our everyday work, social lives and impacting our culture. It is against this backdrop that the birth of online Social Networking Sites (SNSs), a new emerging trend has exploded over the last 6-7 years [3].

Since the year 2000, Online Social Networking Sites (SNSs) such as Facebook, Skype, Yahoo Messenger, YouTube, Twitter, LinkedIn, MySpace etc. have also grown enormously paving way for communication to occur using the Internet. Online SNSs such as Facebook, Skype and Yahoo Messenger use a combination of voice, data and video for communication and most of the time one does not need to own a Smartphone to be able to access these added features. It must however be emphasized that all new Smart phones are now being used for voice, data and video communication. Since the proliferation of Online SNSs, many subscribers/users have reduced their voice communication activities using mobile devices and opted for communication through Online SNSs because they are cheaper, friendlier, much more interactive

and have more communication features. A major challenge which this paper seeks to address, is how Telecommunication Industry in Ghana can retain and/or satisfy customers who will opt to use Online SNSs for communication instead of using mobile phones or Smartphones connected to their networks.

This paper is formulated, structured and arranged/outlined chronologically as follows: After the Introduction, the Background and Effects of Online SNSs are discussed in Section 2. Brief Background of the Telecom Industry in Ghana is presented in Section 3. The Objectives of the Research and the Problem Formulation of the paper are further discussed Sections 4 and 5 respectively. Sections 6 and 7 discuss Related Work and Research Methodology of the paper respectively. Research findings and Analysis are discussed in Section 8. Research Discussions and Conclusions are elaborated in respectively in Sections 9 and 10 of the paper.

2. BACKGROUND AND EFFECT OF ONLINE SNS

The first social network site, SixDegrees.com, was launched in 1997. SixDegrees.com allowed users to construct their profiles and add friends to their contacts lists. Profiles of users/subscribers could then be searched and was used by most major dating sites and many community sites [5]. During the years following 1997, more and more popular social network sites have sprung up and have been attracting multitudes of users. Figure 1 [5] clearly shows from left to right, the development of SNSs since 1997 when the first social network site was designed.

1997 – SixDegrees.com	1998	1999 – Live Journal, Asian Avenue, Black Planet	2000 – MiGente, Six Degree Closes
2001 – Cryworld, Ryze	2002 – Fotolog, Friendster, Skyblog	2003 – Couch Surfing, LinkedIn, MySpace, Tribe.Net, BC/Xing, Last. FM, Hi5	
2004 – Orkut Dosgter, Flickr, Mixi, Facebook (Harvard Only), Multiply, aSmallWorld, Dodgeball, Care 2 (SNS Relaunch), Cater, Hyves	2005 – Yahoo 360! YouTube (SNS Relaunch), Cryworld (China), Bebo (SNS Relaunch), Facebook (High School Networks), Ning, Asian Avenue, Black Planet (SNS Relaunch)		2006 – QQ (SNS Relaunch) Facebook (Corporate Networks), Windows Live Spaces, Cryworld (US), Twitter MyChurch, Facebook (Everyone)

Figure 1: Timeline of the launch dates of many major SNSs and dates when community sites re-launched with SNSs features

2.1 Positive Effects of Online SNSs

Before the advent of modern electronic communication devices, how were people communicating and sustaining relationships? Probably through constant letter writing and expensive phone charges. A major factor was distance. A successful way to maintain relationships is through communication. If the person in question is in close proximity, friendships were maintained by direct communication. If the friend is further away, other means such as the use of the Post Office through which letters and gifts could be sent and

delivered can be used/applied. Common interests in hobbies or work is always a good foundation for any relationship. The biggest bottleneck for any kind of relationship is always communication. Communication must be easily and readily accessible to both parties for the chance of the relationship to be maintained [3]. An important mechanism for online SNSs to be successful is to provide an environment that facilitates increasing one's social circle of friends. The tools in the QQ networking site is a prime example of successful infrastructure in China. QQ is the biggest online SNSs' software which belongs to Tencent Internet Company in China.



According to China Internet Watch [6] the number of Online QQ users simultaneously exceeded 100 million, and it is also the first online SNSs application that has simultaneously exceeded 100 million users.

2.1 Negative Effects of Online SNSs

When using an Online SNS, users usually fill in a soft copy form to register with an identity in order to subscribe to a user name and password. This phenomenon allows online SNSs users to choose a role and identity what suits them. This flexibility of subscription/signing in to online SNSs and the ambiguity of the internet allows people to create false identities or steal identities. The online 'space fakers' who masquerade as other people keep growing [3]. Internet users' concerns about the safety and security of online social networking sites has soared [7].

3. BRIEF BACKGROUND ON THE TELECOMMUNICATION INDUSTRY OF GHANA

3.1 Introduction

Ghana has been a pioneer in African telecommunications: It launched the first cellular mobile network in Sub-Saharan Africa in 1992 and was among the first countries on the African continent to be connected to the Internet and to introduce Asymmetric Digital Subscriber Line (ADSL) broadband services. Ghana led the way in market liberalisation and deregulation when it privatised Ghana Telecom (GT) as early as 1996. Since then, Ghana has become one of the African Continent's most vibrant mobile markets with now six competing operators, including regional heavyweights such as MTN, Vodafone, Millicom (Tigo) and Zain (Airtel) which was taken over by Bharti of India in 2010 [14].

Internet user penetration is still low at around 10% of the population, but developments are now speeding up following the introduction of wireless and 3G mobile broadband technologies such as iBurst, WiMAX and High Speed Packet Access (HSPA). The arrival of two new international submarine fibre optic cables, Glo-1 and Main One in 2009 and 2010 has finally brought competition to the international bandwidth sector as well which was previously dominated by GT with its shareholding in the South Atlantic 3/West Africa Submarine Cable (SAT-3/WASC) cable. This, in combination with national fibre backbone networks that is being rolled out by various players, is revolutionising the Ghana's broadband market and paving the way for convergence of technologies and services [14]. Table 1, shows the market penetration trends in Ghana's telecom sector at the end of 2011.

Table 1: Estimated Market Penetration Rates in Ghana's Telecoms Sector at the end of 2011

Market	Penetration rate
Mobile	80%
Fixed	1%
Internet	11%

Source: <http://www.budde.com.au/Research/Ghana-Telecoms-Mobile-Broadband-and-Forecasts.html#overview>

Regulation of the telecommunications market is an essential component of public policy to ensure effective competition and broad, equitable development. In Ghana regulation is the primary responsibility of the National Communications Authority (NCA), with guidance from the Ministry of Communication and advice from any interested parties, including industry, the private sector, consumers, civil society, and the Government in its capacity as a user. Protection of operators and consumers from unfair conduct of other operators with respect to quality of service and payment of tariffs, and protection of consumers' interest are also the responsibility of the NCA [8]. The main Telecommunication Companies in Ghana include:

3.2 Mobile Telecommunication Network (MTN)

MTN began operation in Ghana in the 1990s with a brand name Scancom: "Spacefon" and then "Areeba". As the leading telecommunications company in Ghana, MTN is focused on providing excellent telecommunications services across Ghana and the African continent. MTN believes that through access to communication comes economic empowerment. MTN is truly committed to maximizing productivity and efficiency by delivering uniquely designed communication solutions. MTN has a wide variety of network services as well as segments. These are specially designed for different kinds of people to enhance their mobile experience. MTN understands that the best way to gain a competitive edge in a local market is to offer different segments which suits people's life styles and economic situations [9].

MTN has a mission of building shareholders' value by ensuring maximum customer satisfaction through providing latest telecommunication services, at the most economical rates while meeting its social responsibilities as a good corporate citizen and providing growth prospects for its employees. MTN's vision is to be the leading telecommunication service provider in emerging markets [9].

3.3 Airtel Ghana (Formerly Zain Ghana)

Airtel was launched in Ghana on November 2010 as one of the 16 operating countries of Airtel International. As a



company which prides itself in being the most affordable, Airtel Ghana is driven by the vision of providing affordable and innovative mobile services to all, evidenced by the genuinely low tariff and incentives offered to customers. Airtel has African operations in: Burkina Faso, Chad, Democratic Republic of Congo, Gabon, Ghana, Kenya, Malawi, Madagascar, Niger, Nigeria, Seychelles, Sierra Leone, Tanzania, Uganda and Zambia. Airtel takes the lead with innovative services including the Airtel One network which is currently available in 16 countries in Africa and the award-winning Airtel Money (e-Commerce) service [10].

3.4 Millicom International Cellular (MIC) South Africa

Millicom International Cellular (MIC) S.A., operators of **Tigo Ghana**, is a leading international developer and operator of cellular telephone services worldwide primarily in emerging markets operating across Latin America, Asia, Europe and Africa. Tigo provides affordable, widely accessible and readily available cellular telephony services to more than 30 million customers in 17 emerging markets in these continents.

The success of Tigo is based on the triple 'A' business model which stands for Affordability, Accessibility and Availability. This guarantees that subscribers of Tigo experience the best services at the most affordable rates throughout the ten (10) regions of Ghana and beyond [11].

Tigo Ghana Vision:

The objective of Tigo is to provide people in emerging markets the freedom to access today's world. To make this happen Tigo creates 'A world where mobile services are Affordable, Accessible and Available everywhere and to all [11].

Tigo Ghana Mission:

Provision of services for people who want to stay in touch, belong to communities and to be informed and entertained, enabling them to express their emotions and enhance their lives. Tigo delivers the 3 A's, Affordability, Accessibility and Availability; providing affordable services, good coverage and ease of purchase and use. Tigo focuses on consistently meeting and exceeding customer's expectations and developing an inspirational brand [11].

3.5 Vodafone Ghana

Vodafone in Ghana is an operating company of Vodafone Group Plc., the world's leading mobile telecommunications company, with a significant presence in Europe, the Middle East, Africa, Asia Pacific and the United States. Vodafone Ghana is the only total communications solutions provider - mobile, fixed lines, internet, voice and data - and is currently unmatched in providing fixed line and internet services - the leader and the first choice for Ghanaians. Vodafone is the third ranked operator in mobile with a huge potential to take over the market. As a corporate body, Vodafone values their customers and constantly build key relationships with the private sector and government. The goal of Vodafone is to be the communications leader in an increasingly connected world. Vodafone Ghana aims to provide the kind of innovative and responsive service for which the Vodafone Group is recognized worldwide [12].

3.6 Expresso (Formerly Kassapa)

Expresso Ghana operation has been in existence since 1995, initially operating under the name of Celltel; it was the second mobile operator in the country at the time. In 1998, Hutchison Telecom then acquired 80% of the company, improving the analogue infrastructure that was in place at that time. In January 2003, the company was re-branded to Kasapa Telecom, the only locally branded telecom operator in the country, with 9,000 subscribers. Kasapa experienced significant growth and in September 2005, the company made a switch from an analogue network to a Code Division Multiple Access (CDMA) network to further strengthen its market position. In July 2008, Expresso Telecom acquired 100% of the company. After the acquisition, the company has been working on many strategic initiatives and, more recently, an operational transformation project and network expansion programme has seen the company increase its coverage from 40% to nationwide coverage. Following the network expansion and upgrade, in November 2010 the company successfully re-branded into Expresso, now providing unrivalled high-quality voice and data services to customers across various market segments. Expresso's aim is to attract the people of Ghana to their network and significantly increase their market share by providing the best products and services, and exceptional customer service [13]

According to the NCA, the voice trends of the voice subscription of the above telecom operators in Ghana as at October 2011 are depicted in Figures 2 and 3.



<http://www.esjournals.org>

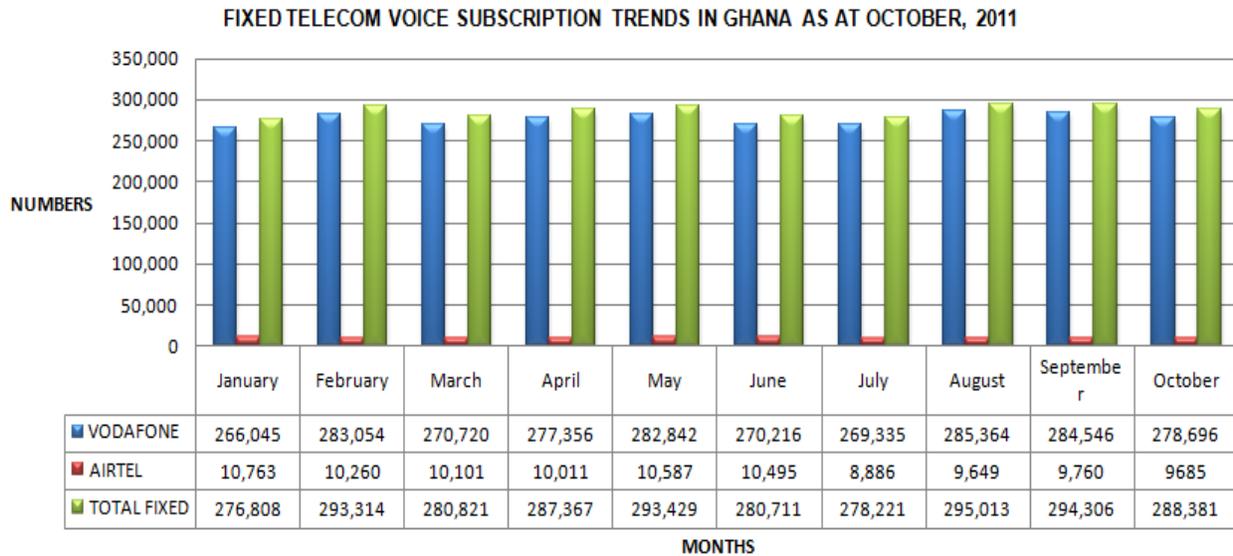


Figure 2: Fixed Voice Subscription Trends in Ghana as at October 2011

Source: http://nca.org.gh/downloads/subscriber_base_October_2011_web_version.pdf

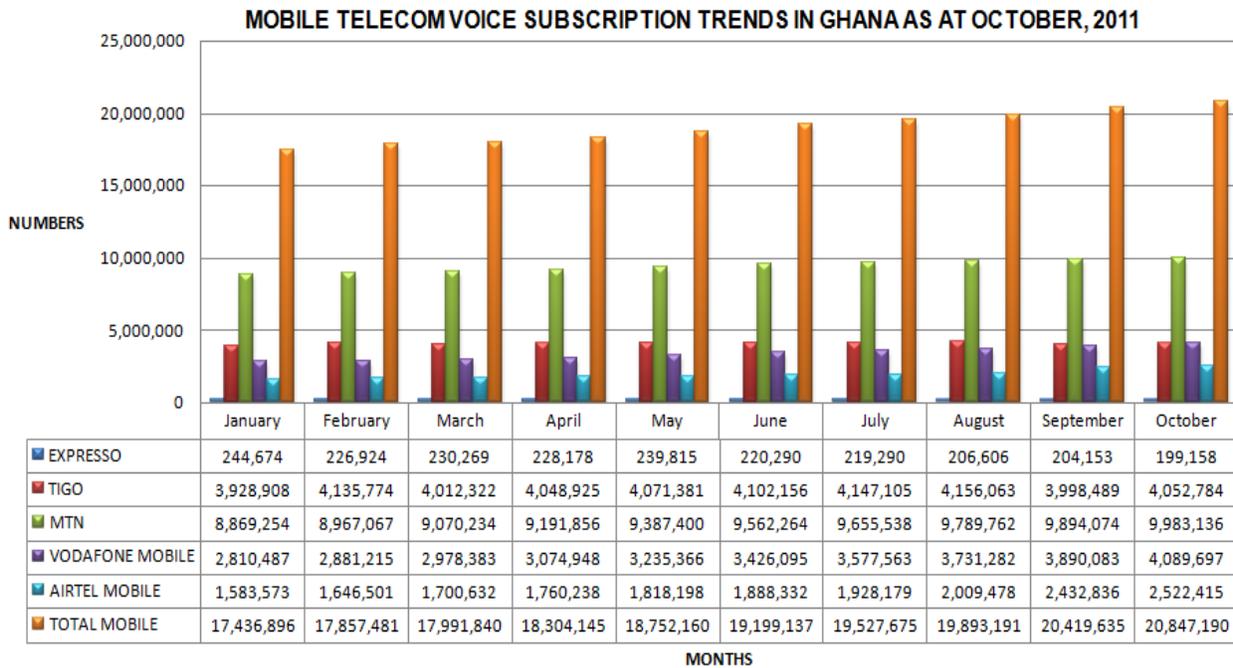


Figure 3: Mobile Voice Subscription Trends in Ghana as at October 2011

Source: http://nca.org.gh/downloads/subscriber_base_October_2011_web_version.pdf



From Figure 3, it is evident that MTN is the current mobile operator leader of voice subscription trends in Ghana, followed by Vodafone, Tigo, Airtel and lastly Expresso. Voice subscription as at October 2011 involving Fixed Operators (Vodafone and Airtel) as depicted in Figure 2 is currently led by Vodafone Ghana.

4. RESEARCH OBJECTIVES

The main objectives of this research paper are to:

- Analyse the impact of Online SNSs in the Telecommunication Industry of Ghana.
- Discuss and suggest improvements of the found Impacts and influences for better telecommunication markets and customer services in Ghana.

4.1 Research Hypothesis

As a result of the literature reviewed about the current and different telecommunication procedures methods used in both online SNSs and mobile devices by customers in Ghana, we came up with the following hypotheses in order to solicit the exact and required information regarding which telecommunication procedures customers prefer and perform so as to draw a conclusion of our analysis and meet the above research objectives.

- Hypothesis 1 (**H1**): Voice, video and data communication using mobile phone/Smartphone.
- Hypothesis 2 (**H2**): Voice, video and data communication using Personal Computer (PC).
- Hypothesis 3 (**H3**): Voice communication using fixed phone/ landline.
- Hypothesis 4 (**H4**): Voice communication using mobile phone/Smartphone.
- Hypothesis 5 (**H5**): Voice communication using fixed phone/ landline + Video and data communication using PC.
- Hypothesis 6 (**H6**): Voice communication using mobile phone/Smartphone + Video and data communication using PC.
- Hypothesis 6 (**H7**): Other Telecommunication procedure/methods.

5. PROBLEM FORMULATION

The growth and proliferation of Online SNSs in Ghana is likely to have an impact on the traditional mode of voice communication in the telecommunication industry. Because of cheaper rates and more communication features in Online SNSs, customers of telecommunication industry in Ghana have an option of using Online SNSs to communicate with families, friends and colleagues and this reduces the use of mobile phones for communication through a telecommunication network resulting in low patronage. In view of these situations, our paper will try to answer the following research questions:

- To what extent have Online SNSs impacted the Telecommunication Industry in Ghana?
- What strategies can Telecommunication Companies in Ghana adopt to retain and satisfy customers although they have the option to use Online SNSs?
- Is there any way to bridge the Social Computing and Mobile Computing gap of customers in the Telecommunication Industry in Ghana?

6. RELATED WORK

In [3], elaboration is given on the various perspectives of Online Social Networking Sites (SNSs) – their advantages and disadvantages, the influence upon our life, how it helps people to build relationships and maintain friendships, and how it affects the structure of communication and social cultural rites. Online SNSs' prevalence in today's society is an incremental evolution to the concepts of friendship and social organization and structure. [3] further discusses positive and negative effects of Online SNSs in terms of positively building social circles and new friendships and negatively creating fraudulent situations and cultural rites changing which can also be positive.

The report in [4] examines the socio-economic impact of Social Computing applications in Europe. It finds that Social Computing applications, or *Social Computing* for short, has already brought about significant changes which have led to disruptive impacts on industry, citizens, identity, social inclusion, education, health and public governance. The emergence of Social Computing in the Information Society scene in 2003 was unexpected. Furthermore [4] discusses that today, a little more than five years later, hundreds of millions of users worldwide are using Social Computing applications such as Social Networking Sites (SNSs), blogs, collaborative filtering of content, file, photo and video sharing, tagging and annotation, online multi-player games and collaborative



platforms for content creation and sharing which is only the beginning of more social computing events to occur.

The report features a comprehensive empirical analysis of Social Computing that is intended to inform policy makers. [4] further discusses that Social Computing has both direct and indirect effects on the implementation of the European Lisbon strategy, especially on the post-i2010 agenda currently being drafted. The research involved in [4] was conducted by the Information Society Unit at JRC-IPTS over the last three years.

7. RESEARCH METHODOLOGY

- **Informal Interview:** One of the researchers informally interviewed two Telecommunication Industry Staff in Ghana through Skype to find out what they think about the current impact of Online SNSs in the telecommunication industry of Ghana.
- **Questionnaire (Appendix A):** This took the form of easy-answer open-end and closed-end printed questions given to selected customers (mainly workers and students) of the telecommunication industry in Ghana. Based on the research study, questionnaires were prepared to know the communication needs and preferences of customers in the telecom industry of Ghana.

8. DATA ANALYSIS AND RESEARCH FINDINGS

8.1 Questionnaire Distribution – Customers of Telecommunication Industry in Ghana

We distributed one hundred and fifty (150) questionnaires to both female and male students and workers at various workplaces and training institutions in Ghana. Out of the 150 questionnaire distributed, we received 114, representing 76% which we used for our research analysis and hypothesis testing. Tables and Charts were used for the responses to the questionnaires.

8.2 Questionnaire Responses – Customers of Telecommunication Industry in Ghana

- Responses to question one (Q1) of the questionnaire, which asked about the gender of customers is depicted in table 2. Table 2 shows that responses were received from more males (87) representing 76% than females (27) representing 24%.

Table 2: Gender of Telecom Subscription – Customer Respondents (Q1)

GENDER	NUMBER	PERCENTAGE
Male	87	76%
Female	27	24%
TOTAL	114	100%

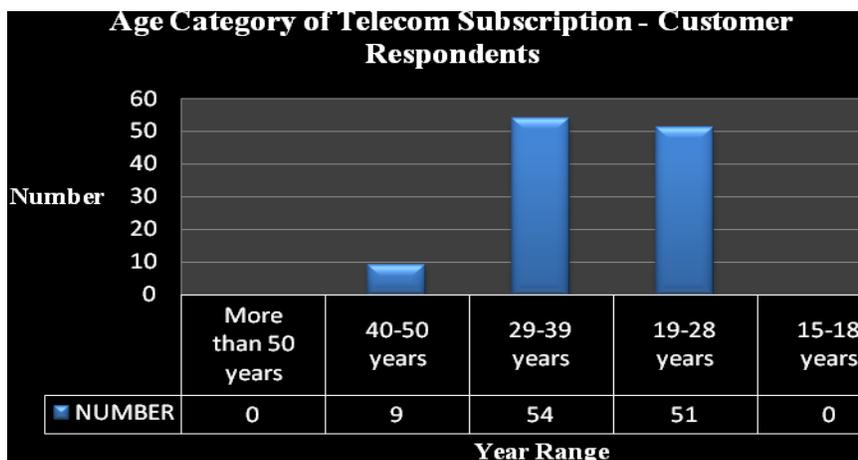


Figure 4: Age Category of Customers (Q2)



- Responses to question two (Q2) of the questionnaire, which asked about the age category of customers is depicted in figure 4 above. Figure 4 shows that the highest range and majority of the customers respondents were 29-39 years (54), followed by 19-28years (51) and lastly 40-50 years (9).
- Responses to question three (Q3) of the questionnaire, which asked about how long

customers have subscribed to the mobile telecom industry in Ghana is depicted in figure 5. Figure 5 shows that 48 of the customers had the highest duration of 6-10 years followed by 27 customers having durations of 1-5 years and 11-15 years respectively. 6 of the customers have been mobile telecom subscribers for more than 20 years and another 6 have been mobile telecom subscribers for 16-20 years.

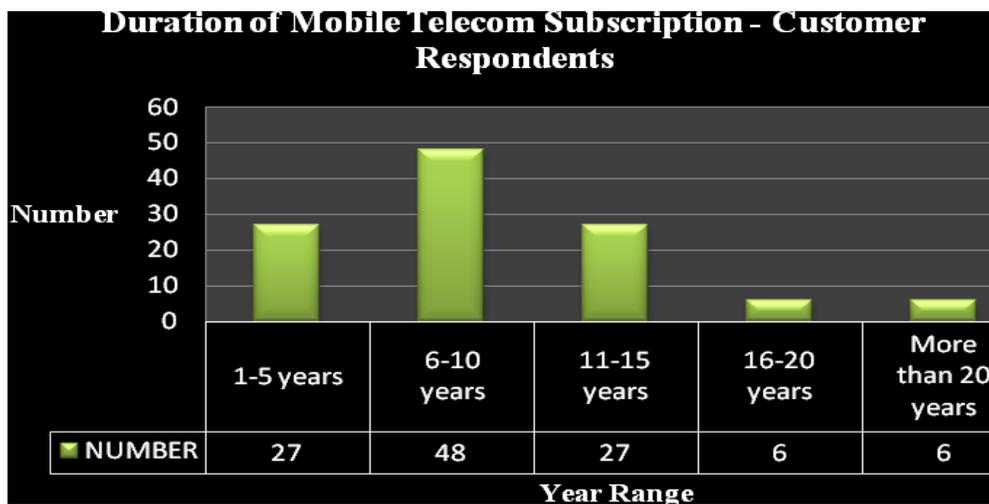


Figure 5: Mobile Telecom Subscription Duration of Customers (Q3)

- Responses to question four (Q4) of the questionnaire, which asked how long customers have subscribed to the fixed telecom industry in Ghana is depicted in figure 6. Figure 6 shows that 33 of the customers had the highest duration of 6-10 years followed by 24 customers having duration of 1-5 years. 12 of the

customers have been fixed telecom subscribers for more than 20 years and another 18 have been fixed telecom subscribers for 11-15 years. 3 of the customers have been fixed telecom subscribers for 16-20 years and 24 of the customers have never subscribed to fixed telecom.

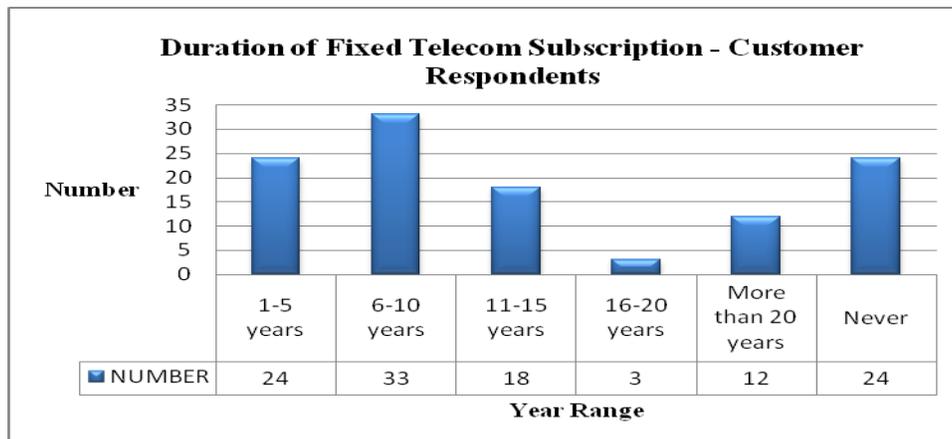


Figure 6: Fixed Telecom Subscription Duration of Customers (Q4)



Responses to question five (Q5) of the questionnaire, which asked how long customers have been using the internet is shown in figure 7. Figure 7 shows that 63 of the customers have been using the internet for 6-10 years followed by 30 customers using the internet for 1-5 years. 3 of the customers

have been using the internet for more than 20 years and another 18 have been using the internet for 11-15 years. None (0) of the customers have been using the internet for 16-20 years.

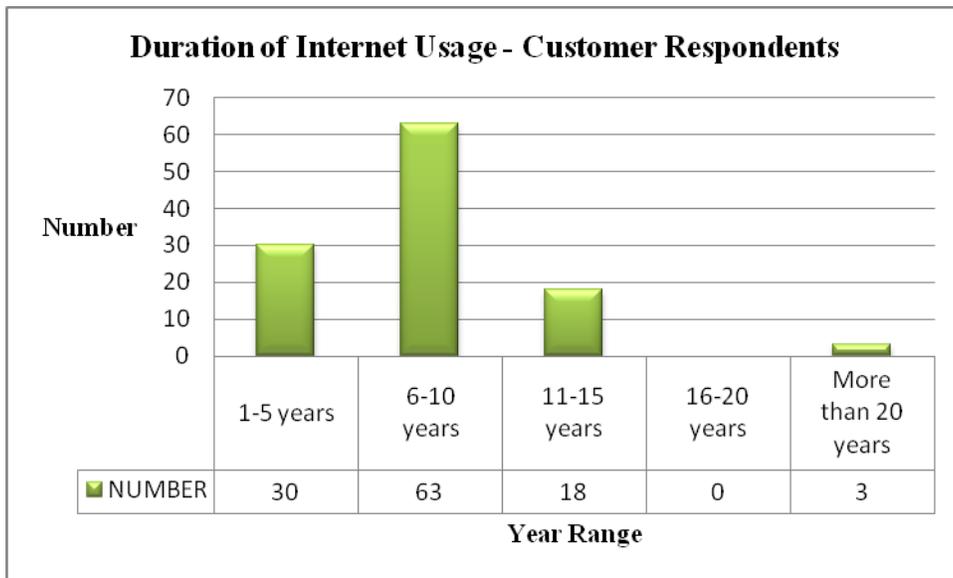


Figure 7: Internet Usage Duration of Customers (Q5)

- Responses to question six (Q6) of the questionnaire, which asked whether customers have are active online SNSs users is shown in figure 8. Figure 8

shows that 87% of the customers are active online SNSs users and 13% of them are not active users.

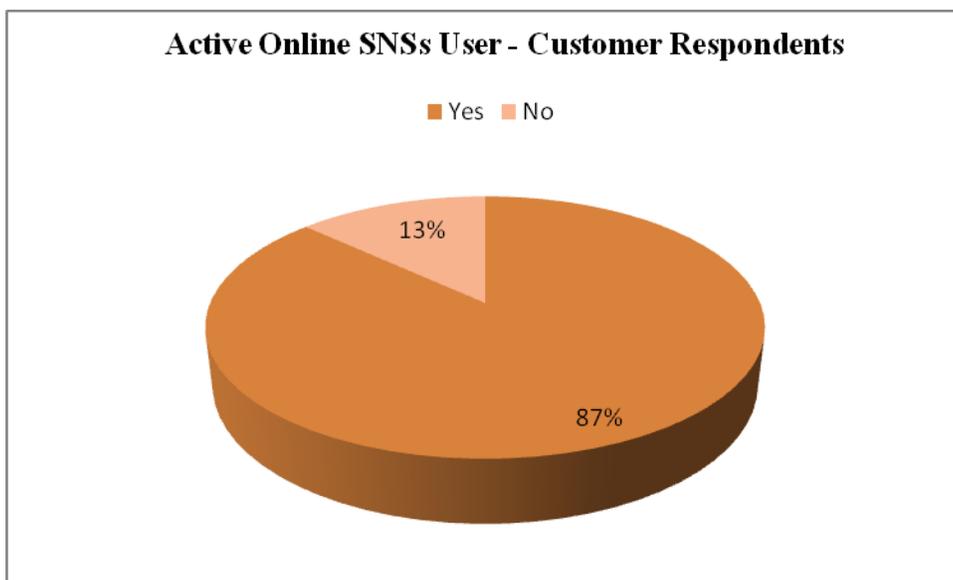


Figure 8: Customers who are Active Online SNS Users (Q6)



- Responses to question seven (Q7) of the questionnaire, which asked about the most popular online SNS used by customers is shown in figure 9. Figure 9 shows that 81 of the customers popularly

use Facebook, followed by Skype (66), Yahoo Messenger (60), YouTube(36), LinkedIn(39), Twitter (30), Other (12) and None (15).

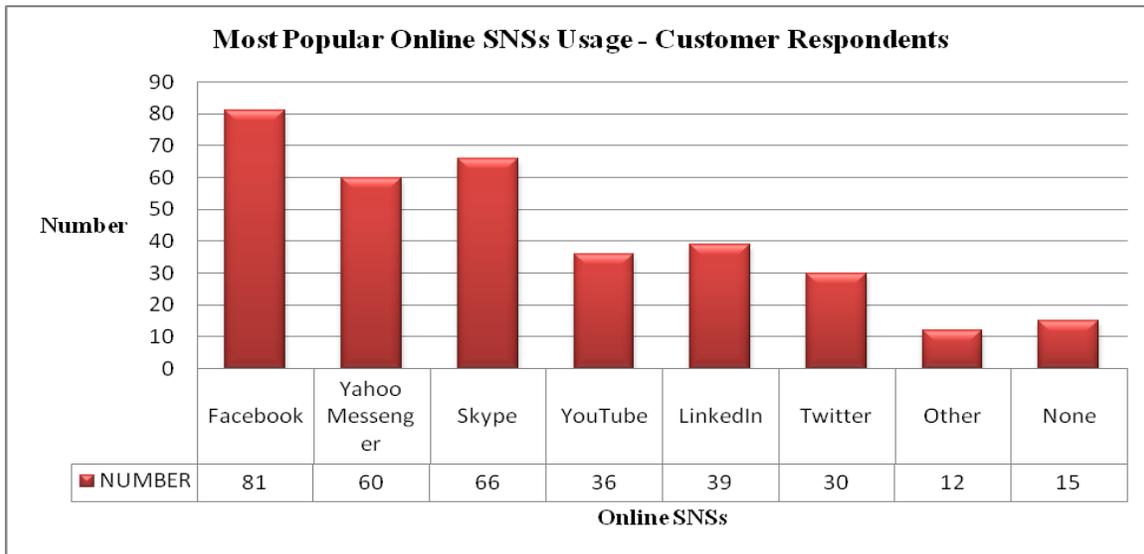


Figure 9: Most Popular Online SNS Used by Customers (Q7)

- Responses to question eight (Q8) of the questionnaire, which asked how long customers have been active online SNS users is depicted in figure 10. Figure 10 shows that 66 of the customers have been active online SNS for 1-5 years followed by 24

customers having active online SNS duration of 6-10 years. 9 of the customers have been active online SNS for 11-15 years and another 15 have never been active online SNS users. None (0) of the customers have been fixed telecom subscribers for 16-20 years.

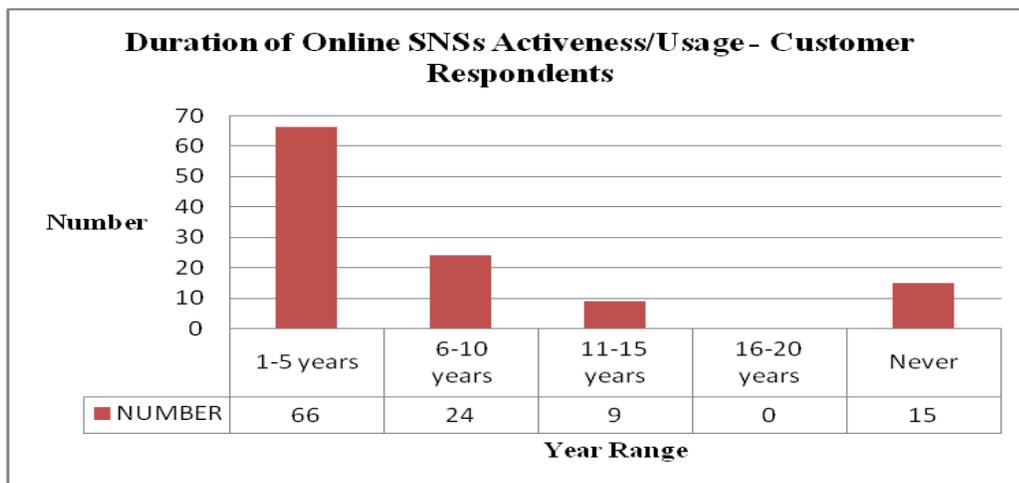


Figure 10: Customers Duration of Active Online SNS Usage (Q8)



- Responses to question nine (Q9) of the questionnaire, which asked reasons why some of the customers didn't use SNS. A total of 15 customers didn't use online SNSs at all with their reasons listed in Table 3.

Table 3: Reasons for not Using Online SNSs - Customer Respondents (Q9)

REASON	NUMBER	PERCENTAGE
Not relevant and important to me	0	0%
I am used to/prefer to use my mobile phone/Smartphone for all my communication purposes	6	40%
I don't have internet connectivity to use Online SNSs	6	40%
I am not IT literate enough to use Online SNSs	3	20%
Internet connectivity is too expensive for me to use Online SNSs so I prefer communicating using my mobile phone/Smartphone	0	0%
TOTAL	15	100%

- Responses to question ten (Q10) of the questionnaire, which asked about the most popular online SNS used by customers is shown in figure 11. Figure 11 shows that 42 customers' best prefer using Skype, followed by Facebook (18), Twitter (15), Yahoo Messenger (12), LinkedIn (6), Other (6) YouTube (0) and None (15).

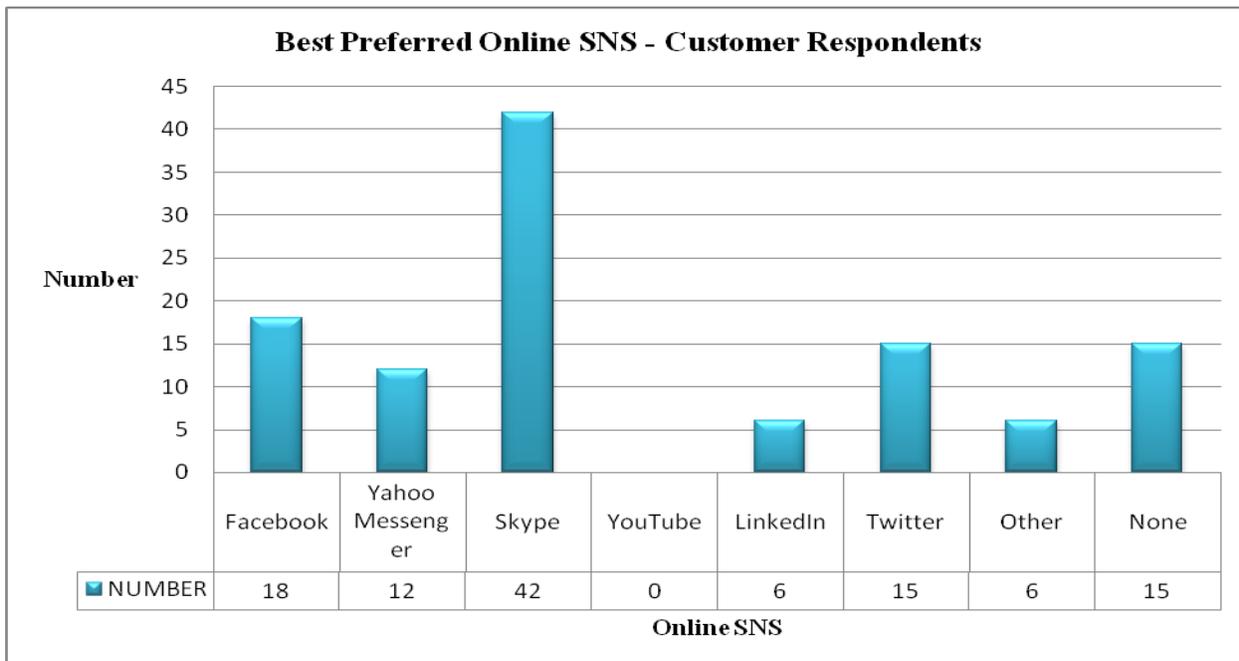


Figure 11: Customers Best Preferred Online SNS Usage (Q10)

- Responses to question eleven (Q11) of the questionnaire, which asked about the mobile device category ownership of the customers is depicted in figure 12. Figure 12 shows that 60 of the customers

own a mobile phone, 18 own a smartphone, 36 own both mobile phones and Smartphones and there wasn't any customer who didn't own a mobile device.

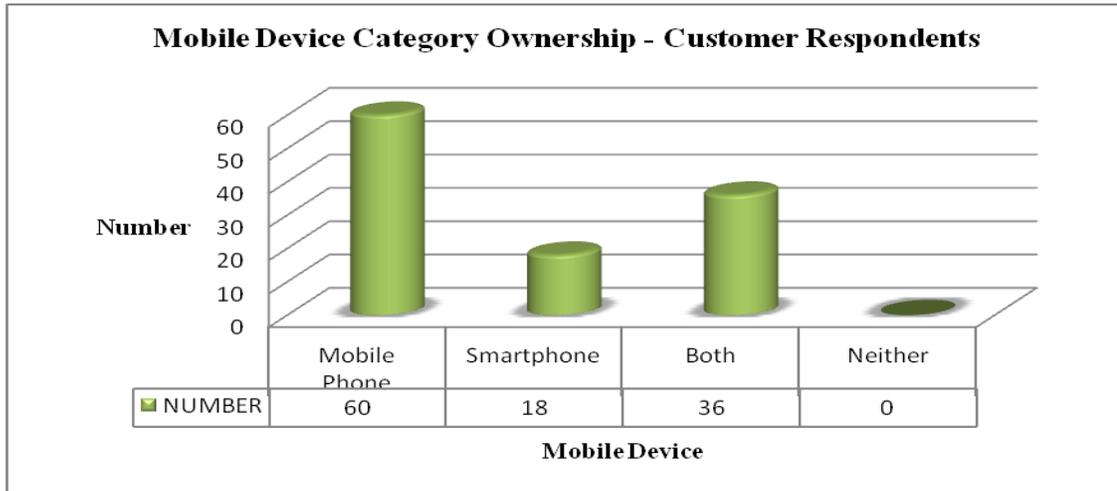


Figure 12: Customers Mobile Device Category Ownership (Q11)

- Responses to question twelve (Q12) of the questionnaire, which asked about the PC category ownership of the customers is depicted in figure 13. Figure 13 shows that 72 of the customers own a

laptop/notebook, 3 own a desktop, 21 own both laptops/notebooks and desktops and 18 customers don't own a PC.

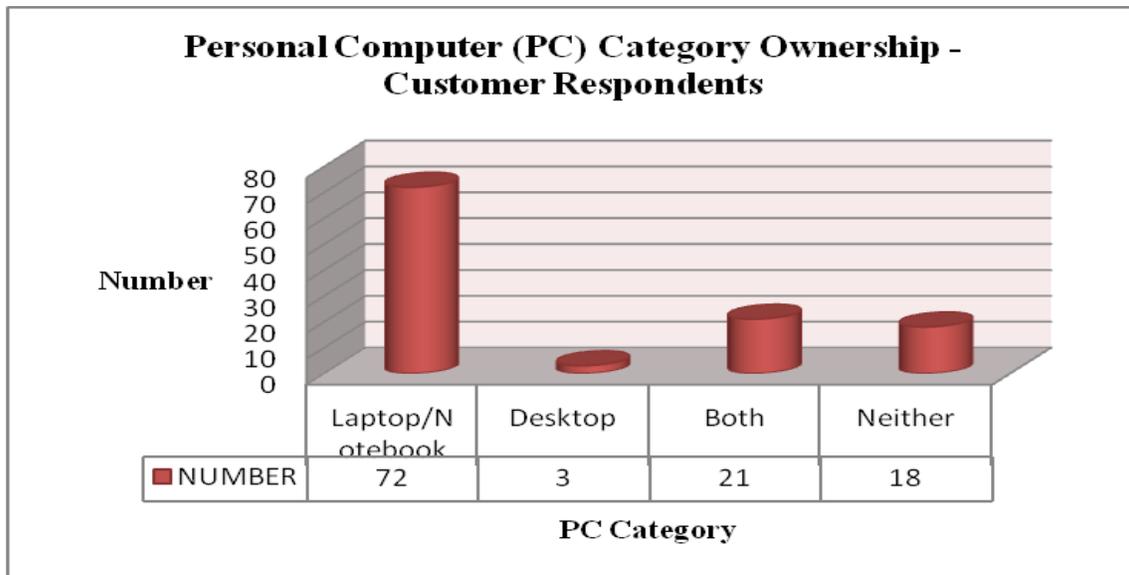


Figure 13: Customers Mobile Device Category Ownership (Q12)



- Responses to question thirteen (Q13) of the questionnaire, which asked about the Telecom Operators of the customers subscribed to is depicted in figure 14. Figure 14 shows that 66 of the

customers subscribe to MTN, followed by Airtel (63), Tigo (48), Vodafone (36), Expresso (12) and lastly Glo (0).

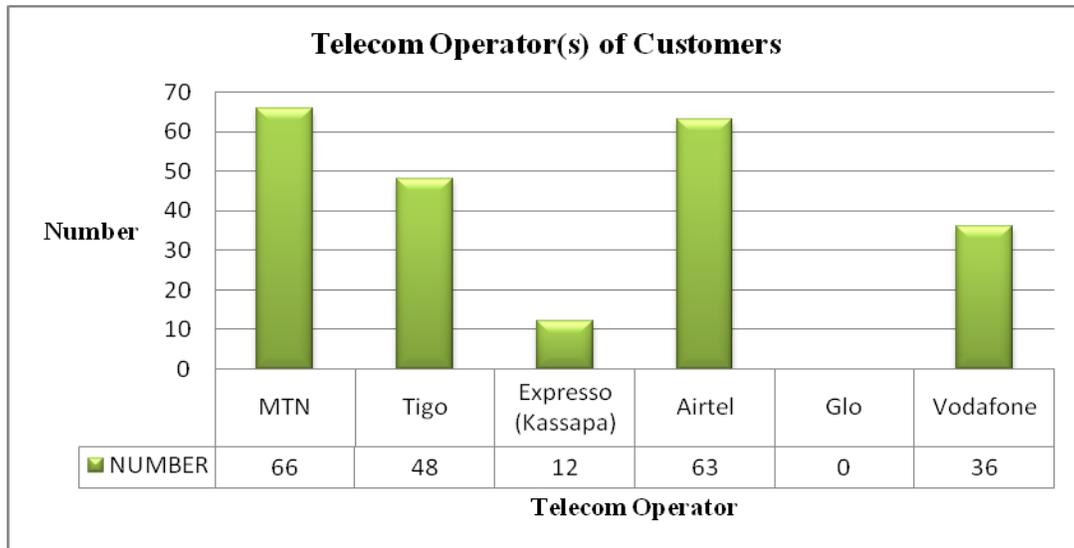


Figure 14: Telecom Operator(s) of Customers (Q13)

- Responses to question fourteen (Q14) of the questionnaire, which asked the customers whether Telecom Operators provide Internet as part of their

services is depicted in figure 15. 95% of the customers responded "Yes" and the remaining "5%" responded "No" and shown in figure 15 below.

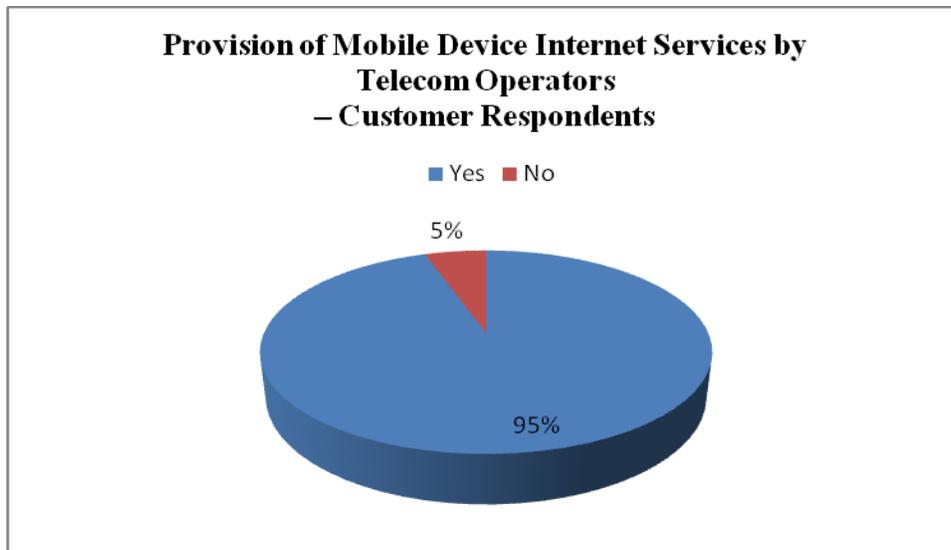


Figure 15: Provision of Mobile Device Internet Services by Customers (Q14)

- Responses to question fifteen (Q15) of the questionnaire, which asked the customers whether the Internet services provided by the Telecom Operators

was user friendly is depicted in figure 16. 58% of the customers responded “Yes” and the remaining “42%” responded “No”.

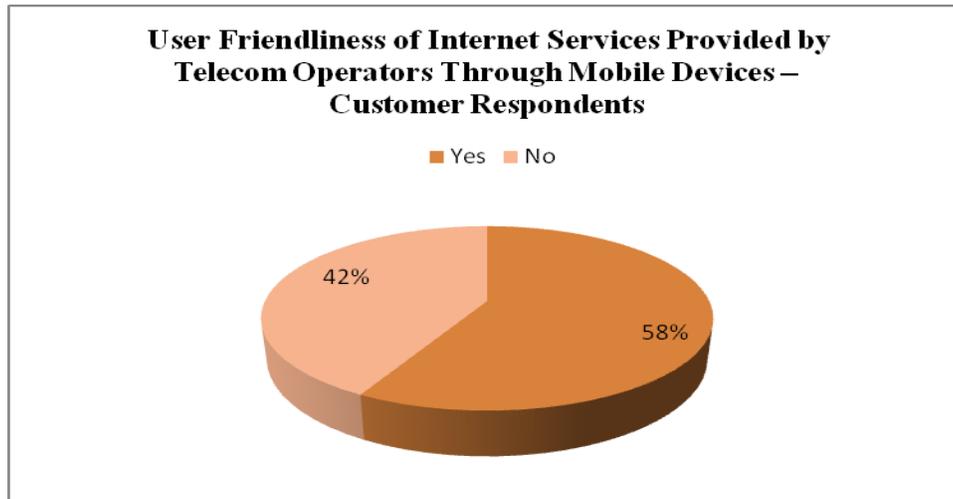


Figure 16: User Friendliness of Internet Services provided by Telecom Operators (Q15)

- Responses to question sixteen (Q16) of the questionnaire, which asked the customers whether the cost rate of Internet services provided by their Telecom Operators is cheaper than using internet on

a PC is depicted in figure 17. 16% of the customers responded “Yes” and the remaining “84%”, which formed the majority responded “No”.

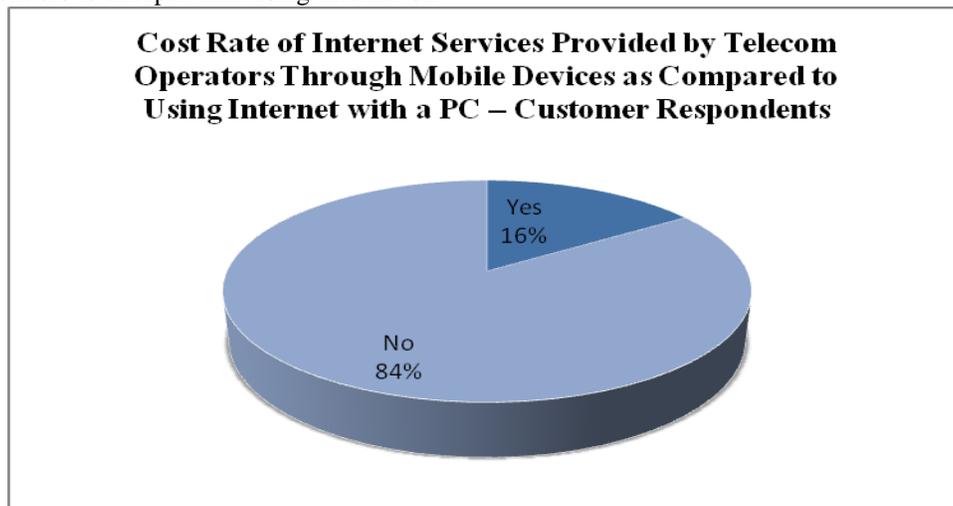


Figure 17: Internet Cost Rate Comparison between Provision from Telecom Operators and Using PC (Q16)

- Responses to question seventeen (Q17) of the questionnaire which asked the customers who answered “No” to Q14 i.e. whether they will like their Telecom Operators to provide Internet Services

is depicted in Table 4. Table 4 shows that all the customers who responded “No” to question 14 are all interested in internet service provision by their Telecom Operators.

Table 4: Likeness of Telecom Operator to Provide Internet Services – Customer Respondents (Q17)

LIKE NESS OF INTERNET SERVICE PROVISION BY TELECOM PROVIDERS	NUMBER	PERCENTAGE
Yes	6	100%
No	0	0%
TOTAL	6	6%

- Responses to question eighteen (Q18) of the questionnaire, which asked the customers whether their telecom operators provided internet services through other platforms such as Modems is depicted

in figure 18. Figure 18 shows that 82% of the customers which formed the majority, responded “Yes” and the remaining “18%”, responded “No”.

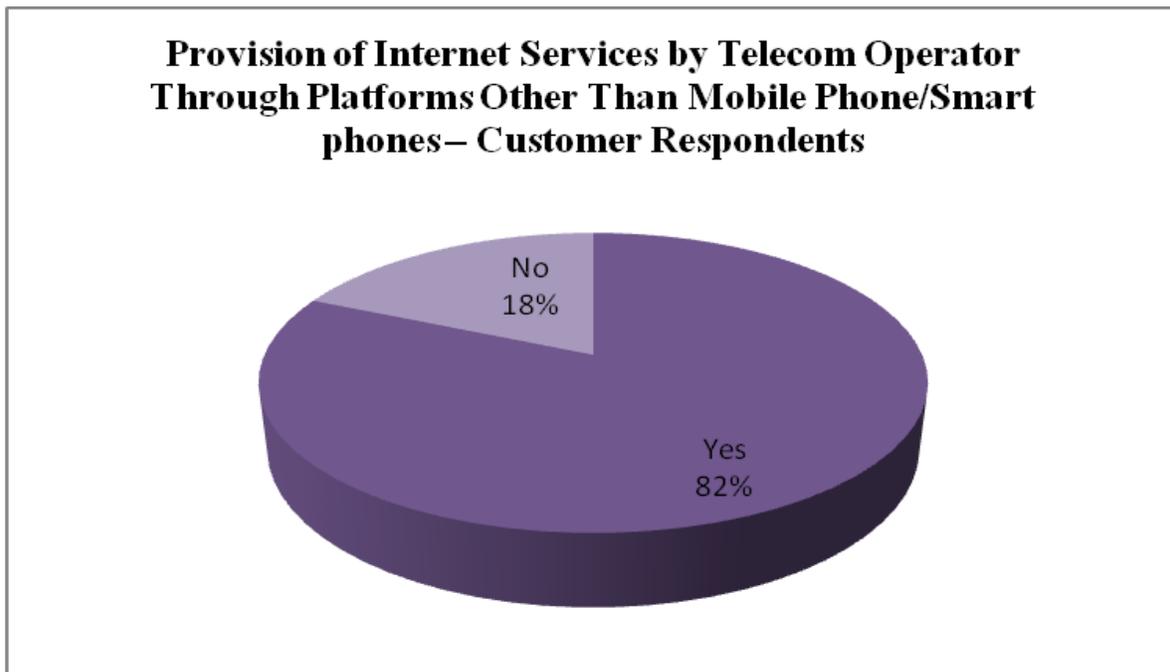


Figure 18: Provision of Internet by Telecom Operators Through Other Platforms (Q18)

- Responses to question nineteen (Q19) of the questionnaire, which asked the customers about their communication process mostly performed by customers is depicted in table 5 and figure 19. Table 5 and Figure 19 show that 45 of the customers, which forms the majority, mostly perform communication involving both SNSs from PC and mobile devices for (voice, video and data), 30 of the customers mostly

use only SNS from PC for their communication purposes (voice, video and data), 15 mostly use their mobile devices for voice, video and data communication and another 15 mostly use their mobile devices for only voice communication. Only 9 of the customers mostly communicate through voice using fixed landline.



Table 5: Communication Processes Mostly Performed – Customer Respondents (Q19)

COMMUNICATION PROCESS MOSTLY PERFORMED	NUMBER	PERCENTAGE
Voice, video and data communication using my mobile phone/Smartphone	15	13%
Voice, video and data communication using my PC	30	26%
Voice communication using fixed phone/ landline	9	8%
Voice communication using my mobile phone/Smartphone	15	13%
Voice communication using fixed phone/ landline + Video and data communication using my PC	0	0%
Voice communication using my mobile phone/Smartphone + Video and data communication using my PC	45	40%
Other	0	0%
TOTAL	114	100%

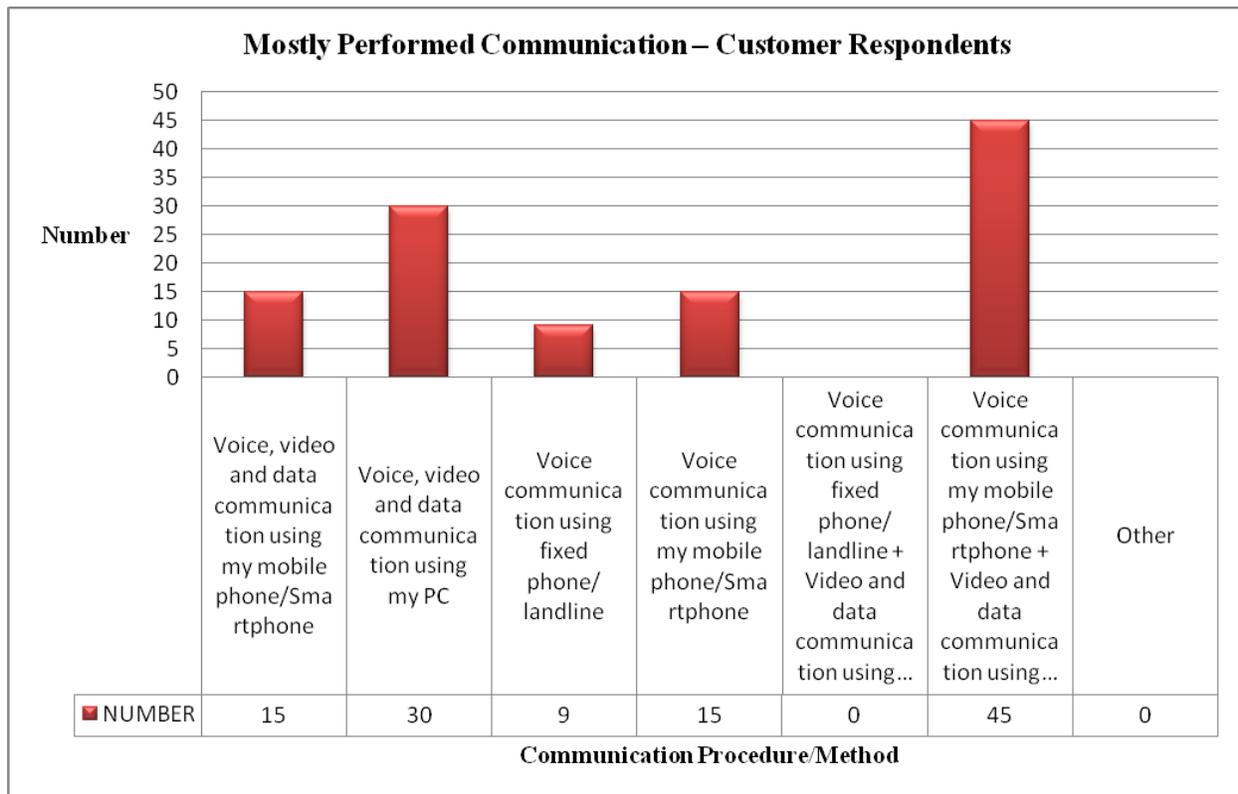


Figure 19: Communication Processes Mostly Performed by Customers (Q19)



- Responses to question twenty (Q20) of the questionnaire, which asked the customers about their communication process mostly preferred by customers is depicted in table 6 and figure 20. Table 6 and Figure 20 show that 42 of the customers, which is the majority, prefer using both online SNSs from PC and mobile devices for communication (voice, video and data), 36 of the customers also prefer using

only online SNSs through PC for their communication purposes (voice, video and data), 24 prefer to use their mobile devices for voice, video and data communication and another 12 use their mobile devices for only voice communication. None of the customers prefer to communicate using fixed landline.

Table 6: Communication Processes Mostly Preferred – Customer Respondents

COMMUNICATION PROCESS MOSTLY PREFERRED	NUMBER	PERCENTAGE
Voice, video and data communication using my mobile phone/Smartphone	24	21%
Voice, video and data communication using my PC	36	31%
Voice communication using fixed phone/ landline	0	0%
Voice communication using my mobile phone/Smartphone	12	11%
Voice communication using fixed phone/ landline + Video and data communication using my PC	0	0%
Voice communication using my mobile phone/Smartphone + Video and data communication using my PC	42	37%
Other	0	0%

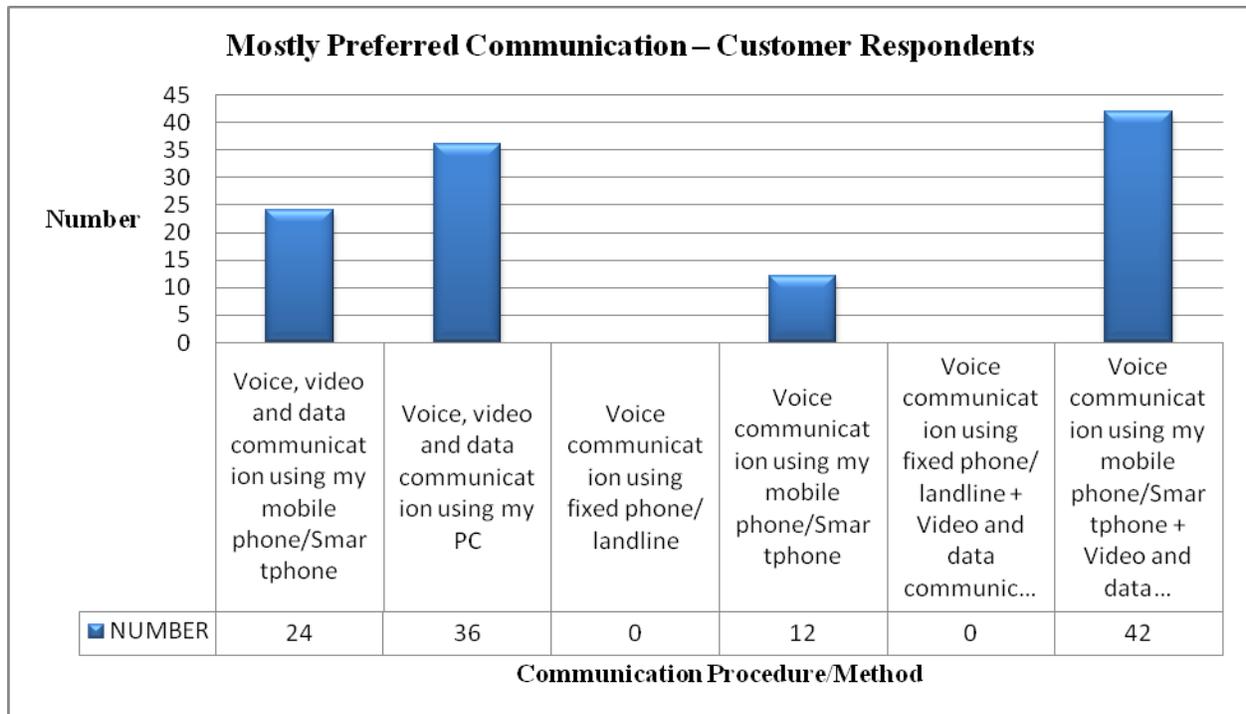


Figure 20: Communication Processes Mostly Preferred by Customers (Q20)



9. RESEARCH DISCUSSIONS

From our research findings, Figures 2-7, show that the Telecom Industry in Ghana has a lot of customers in both youthful and middle ages who have also been patronizing both mobile and fixed telecom services in Ghana for an average of 15 years. This was also confirmed in the informal interview with a Telecom Industry staff. A lot of these customers as depicted in figure 8 are also very active online SNSs users with Facebook as the most popular SNS used by the customers (Figure 9). Only a few customers (15) don't patronize SNSs with their reasons stated in table 3. Most of the customers own mobile phones and smartpones as well as PCs. Majority of the Telecom Operators in Ghana with the exception of Glo (soon to commence business) have customers and according to Figure 15 majority of the Telecom Operators provide internet services on their customers' mobile devices. Some of the customers, however responded that the internet services of their Telecom Operators wasn't user friendly (Figure 16) and that it wasn't cheaper in terms of cost to use a mobile device for internet activities as compared to using a PC to surf the internet (Figure 17). Some customers responded to their preference of online SNSs through PC over mobile devices for communication in terms of updates, current affairs, cheaper rates, reliability and affordability. Tables 5 and 6 and Figures 19 and 20, which were questions used in the questionnaire for hypothesis testing reveals that there is a decrease in mobile voice communication as a result of the rise of online SNSs. 26% (table 5) of the customers mostly use PC for voice, video and data communication. This means the introduction of online SNSs through PCs has decreased voice communication in mobile devices which reflects as 13% (table 5). A total of 76% and 68% (tables 5 and 6) of the customers mostly prefer and perform different types of telecommunications (voice, video and data) through online SNSs using PCs in addition to voice communication through mobile devices respectively, thereby resulting in a decreased and low patronage of *only* mobile devices for voice communication.

10. CONCLUSION AND RECOMMENDATION

This research presented, elaborated and discussed the impact of online SNSs on the customers in the Telecommunication Industry of Ghana and showed that this impact is high regarding communication using online SNSs versus communication using mobile phone. This paper recommends that Telecommunication Companies in Ghana have to strategize their marketing policies and trends and include SNSs through user friendly mobile devices and draw the attention of customers to use smart mobile devices (Smartphones) for internet services that they provide. Obviously the Telecom Operators in Ghana will have to

introduce more smart devices at cheaper costs and good customer benefits. The Smartphones that will be sold to the customers at reasonable cheap rates should have all these online SNSs features which run on their network and for this to succeed however they need to get the foundations right which will involve excellent and high data speeds comprising of 3G (Generation), 3.5G, 4G and later 5G for infrastructural developments.

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APPENDIX A

A research in bid to analyze **The Impact of Online SNSs on Voice and Data Communications in the Telecom Industry of Ghana** is being conducted by a researchers: Nana Yaw Asabere , John Getor and Jacqueline Asafo-Ajyaye
The research methodology and analysis requires your generous and kind attention of a questionnaire below. Thank you for your attention. Please note: SNSs stands for **Social Networking Sites**.

QUESTIONNAIRE FOR CUSTOMERS IN THE TELECOM INDUSTRY OF GHANA

- Q1.** What is your gender? Male Female
- Q2.** Which of the following falls within your age category?
40-50 years 29-39 years 19-28 years 15-18 years More than 50 years
- Q3.** How long have you been a customer in the Mobile Telecom Industry?
1-5 years 6-10 years 11-15 years 16-20 years More than 20 years Never
- Q4.** How long have you been a customer in the Fixed Telecom Industry?
1-5 years 6-10 years 11-15 years 16-20 years More than 20 years Never
- Q5.** How long have you been an Internet user?
1-5 years 6-10 years 11-15 years 16-20 years More than 20 years Never
- Q6.** Are you an active Online SNSs User? Yes No
- Q7.** If Yes to Q6, which of these Online SNSs do you often use/sign in?
Facebook Yahoo Messenger Skype YouTube LinkedIn Twitter Others
- Q8.** If Yes to Q6, how long have you been an active user of Online SNSs?
1-5 years 6-10 years 11-15 years 16-20 years
- Q9.** If No to Q6, what is/are your reasons?
Not relevant and important to me



I am used to/prefer to use my mobile phone/Smartphone for all my communication purposes

I don't have internet connectivity to use Online SNSs

I am not IT literate enough to use Online SNSs

Internet connectivity is too expensive for me to use Online SNSs so I prefer communicating using my mobile phone/Smartphone

Q10. Which Online SNS is your best preference and serves all your communication needs (Please tick only one)

Facebook Yahoo Messenger Skype YouTube LinkedIn Twitter Others

Q11. Which of these categories of mobile devices do you own personally?

Mobile phone Smartphone Both Neither

Q12. Which of these categories of mobile and computing devices do you own personally?

Laptop/Notebook Desktop Both Neither

Q13. Who are your Telecom operators?

MTN Tigo Expresso (Kassapa) Airtel Glo Vodafone

Q14. Does your telecom operator provide Internet Services on your Mobile phone or Smartphone?

Yes No

Q15. If Yes to Q14, is the internet service on your mobile phone/Smartphone as user friendly as compared to using internet on the PC? Yes No

Q16. If Yes to Q14, is the internet service on your mobile phone/Smartphone cheaper in terms of your credits as compared to the cost of using internet on a PC? Yes No

Q17. If No to Q14, would you like your telecom company to provide internet services? Yes No

Q18. Apart from Internet Service on your mobile phone/Smartphone, does your telecom operator provide other means for you to have internet access (e.g. USB Modem)? Yes No

Q19. Which of these communication processes do you perform most?

Voice, video and data communication using my mobile phone/Smartphone

Voice, video and data communication using my PC

Voice communication using fixed phone/ landline

Voice communication using my mobile phone/Smartphone

Voice communication using fixed phone/ landline + Video and data communication using my PC

Voice communication using my mobile phone/Smartphone + Video and data communication using my PC

Q20. Which of these communication processes do you prefer most?

Voice, video and data communication using my mobile phone/Smartphone

Voice, video and data communication using my PC

Voice communication using fixed phone/ landline

Voice communication using my mobile phone/Smartphone



Voice communication using fixed phone/ landline + Video and data communication using my PC

Voice communication using my mobile phone/Smartphone + Video and data communication using my PC

Q21. Briefly describe, what you think about your preferences of communication processes involving Online SNSs and Telecom Operators and whether it has influenced and affected your relationship with your Telecom operator in terms of patronage of voice and data communications?

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