A MULTI-DIMENSIONAL SERVICE DELIVERY AMONG MOBILE NETWORK PROVIDERS IN GHANA: A CASE OF CUSTOMER SATISFACTION.

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Abstract

The aim of the study was to identify the dimensions of mobile telecommunication services in Ghana as well as to develop a model to identify consumer satisfaction. The research was a non-experimental, explorative, quantitative study. Structured questionnaire was used to collect data from a sample of hundred (300) participants from the University of Ghana.The result showed that the majority of the respondents were satisfied with the overall mobile service offered by their service providers. From the results, call quality was found to be the most important determinant of consumer satisfaction with mobile telecommunication services ($\beta = 0.276$, $t= 5.729$, $P< 0.001$).This was followed by Network charges ($\beta =0.209$, $t= 4.344$, $P< 0.01$). In conclusion, the study results suggests that customer niche is a very peculiar one, with several unique characteristic with regards to their demographic and preferences and therefore should be targeted with the kind marketing activities that is likely to interest them

Keywords: Consumer satisfaction, mobile telecommunication services, Network charges, regression

1. Introduction

Marketing as a social and managerial course through which persons and groups obtain what they need and want through creating and exchanging value with others is on the increase (Armstrong, Kotler, Cunningham, Mitchell & Buchwitz, 2007). The key elements of this definition include the meeting of needs and wants through creating and exchanging value with others. Also, core to this is the customer satisfaction. The success with which a company satisfies customers by providing high-quality goods and services

can make or break its chances of prospering in today's competitive global marketplace. In a recent survey of chief executive officers in the United States, Times Magazine noted that 47 per cent listed customer satisfaction as the main goal of their business (Boone & Kurtz, 1999). As noted by Kampyle (2011), customers distinguish what they really want, thus, know what satisfies them. A business owner's ability to understand and provide what the customers want will determine the success of the business.

This issue reinforces the importance of the marketing concept, which is described by Boone & Kurtz (1999) as a companywide consumer orientation. Nimako et al (2010), In a study of the overall customer satisfaction in Ghana's mobile telecommunication networks, noted that, irrespective of the mobile telecommunication networks in Ghana, customer satisfaction is low; neither equal to nor better than the desire and expectation of the customers. This seem to suggest that, though these mobile telecommunications networks are seeking to satisfy customers through their innovation and creativity, their products do not meet the consumer's requirement for satisfaction. Again, from the study, they noticed that the customer satisfaction dimensions that the customer rated as dissatisfying because the mobile telecommunications were not concentrating efforts on, could have given the customers high satisfaction (Nimako, Azumah, Donkor & Adu Brobey, 2010). This brings us to the fact that, it is important to gear research efforts towards finding the customer specific dimensions that contributes to their satisfaction.

With the influx of several communication companies into the Ghanaian economy, the competition for customers has greatly intensified. This has opened opportunity for customers to select and switch to other mobile operators when he or she is dissatisfied with his/ her mobile service. The introduction of the mobile phone portability services in Ghana however, has increased the edge for mobile service operators to satisfy their client. Thus, the key players in the mobile service industry are Scancom Ghana Limited (MTN), Millicom (TIGO), Airtel Ghana Limited, Vodafone Ghana Limited and Expresso Ghana Limited. These companies are in fierce competition to meet customer's needs in order to gain the bulk of the market share. Owing to the intensive competition and aggressive battle for leadership in the market, customers now have the opportunity to explore and to seek maximum satisfaction. The dilemma this research work seeks to answer is that; what does customer satisfaction in the Ghanaian mobile economy entail or the key indicators that customers consider as being the reason for their satisfaction?

State of the Telecommunication Industry in Ghana

The telecommunication industry in Ghana and in Africa as a whole has been on a very progressive journey and thus covered a great distance in a short period. Since 2004, Africa has been tagged the fastest growing mobile phone market in the world. Not long ago very few people had private

telephones that worked. As recently as 1996, the telephone density of Ghana was 0.26 per cent; this translate to 2.6 telephone lines per every one thousand (1000) people, including thirty-five pay phones in the entire country out of which 32 were located in Accra. This was one of the lowest in Africa. Today there is one phone for every four Ghanaians (www.voanews.com/ Report-Africa is the fastest growing). This tremendous increase in the telephone density has resulted from the establishment of the National Communication Authority (NCA) in 1997, and the subsequent deregulation of the telecommunication industry. An assessment and analysis of customer satisfaction for service delivery of mobile telecommunication networks in Ghana proved that most customers are not satisfied. According to a survey conducted by Nimako and Azumah (2009),which included one thousand (1000) mobile phone users subscribed to different MTN's in Ghana, they found that irrespective of mobile telecom network, customer satisfaction was low: neither equal to nor better than the desire and expectation of the customers.

Determinants of Customer Satisfaction

According to studies (Chen, Ross, & Huang, 2008; Kuo, Wu & Deng, 2009), the population of mobile telephone user was expected to reach more than 85% by the end of 2014, indicating that mobile telephony is poised to surpass fixed telephony as their services are readily available to potential callers around the globe. Several studies and authors have extensively discussed the various determinants of customer satisfaction, particularly in the mobile telecom industry. Some of these authors demonstrated that within the mobile telecommunication services, the core elements sought after by consumers from service providers are the ability to make calls without experiencing call drops or breakages, voice clarity during calls and without any interference within the calls (Lim, Widdows, & Park, 2006; Eshghi, Haughton, & Topi, 2007; Pezeshki, Mousavi, & Grant, 2009). Furthermore, available literature also revealed a positive linkage between Network charges (rates of making calls and sending SMS) and customer satisfaction, with this they explained that particularly low income earners (students) have much regard for the network charges as a prerequisite for selecting a network provider and also determining their satisfaction. In the same respect, some authors also revealed that consumers demand value for their money and thus their satisfaction levels are in most cases determined by the quality associated with the cost they are paying for the services (see for instance Nysveen, Pedersen, Per & Thorbjørnsen, 2005; Shin & Kim, 2008).

Mobile telecommunication businesses have higher levels of antagonism among their competitors. Thus, those in this industry make the adoption of promotional mixes indispensable. These include activities as regular discounts on calls made, sponsoring of popular social programs and the use

of favorites celebrities as brand icons among many others (Munnukka, 2008; Lai, Griffin & Babin, 2009). These have been identified that these activities tend to draw both existing and potential consumers into patronizing the services provided by the mobile telecommunications network (Nysveen et al, 2005; Eshghi et al, 2007). Another important determinant that has been found to exhibit a positive and significant relationship with the satisfaction level of mobile telecommunication services has to do with connectivity and coverage. This has to do with the strength of the network around the country or globe as well as availability in other part of the world or the country. In view of this, most customers consider issues such as a network's ability to cover a wider proportion of localities and getting strong signals at all places within the country. Additionally, consumers expect a reasonable time between placing a call and the actual connection to the receiving party/parties (Loo, 2004; Shin & Kim, 2008). Consistent with literature from some scholars (such as Lai et al, 2009), the availability of such services tend to create not only satisfaction but also act as loyalty schemes to keep existing customers whilst attracting new ones.

2. Method

The study considers the indexes or the dimensions to be considered in identifying a satisfied customer in mobile service industry in Ghana. The research work was sampled students on the University of Ghana campus. Using a cross-sectional survey, this research employed the sampling technique of studies like Saunders et al. (2003).

Participants

With a sample size of three hundred (300) customers, participants were purposively and conveniently recruited following all ethical standards. Demographic characteristics shown in table 1 depicts that, out of the three hundred (300) valid questionnaires obtained, one hundred and thirty-four (134) were males whilst one hundred and sixty-six (166) were females representing 44.7% and 55.3% respectively. There was no bias on the part of the researchers as to the selection of the gender since the questionnaire were administered and done on the basis of respondents' availability and willingness. Also, half of the sampled respondents (representing 50.0%) were within the age range of 21-23 years. Furthermore a large chunk of the respondents (39.7%) were also within the ages of 18-20 years whilst 7.3 percent of the respondents were within 24-26 years. The remaining 3.0 percent were above 26 years. With respect to the number of networks which the sampled respondents are connected to, a large proportion of them (representing 57.7%) were using one telecommunications network whilst the remaining 42.3 percent were having multiple mobile networks. From this it could be deuced that quite a significant number of the respondents have experienced more than one mobile telecommunication network.

Table 1: Demographic characteristics of Interview participants (*N = 300)*

Category	No. of respondents	Percentage %
Gender		
Male	134	44.7
Female	166	55.3
Age (in years)		
18-20	119	39.7
21-23	150	50.0
24-26	22	7.3
No of networks		
One	173	57.7
Several	127	42.3

Measures

We used a 21 item questionnaire which were developed based on the findings of the following studies (Loo, 2004; Nysveen et al., 2005; Shin & Kim, 2008), and pretested on 50 mobile users before use to check its reliability and validity. These questionnaires were made up of close ended questions which were grouped under sub-scales for each determinant. These restricted the respondents' opportunity to express their concerns with the information requested. The responses in the questionnaire were measured with a five-Point Likert-type rating scale measures relative positive or negative response to a statement. The ratings were: Strongly Agree (SA) = 5; Agree (A) = 4; Neutral (N) = 3; Disagree (D) = 2; and Strongly Disagree (SD) = 1.

In this study, both primary and secondary data was used. These were to enable us provide adequate discussions that will help the reader understand the issue and the different variables that comes into play.

Data Analysis

Owing to the aim of the study to develop a model, the questionnaires were put under rigorous analysis to estimate its reliability using a one sample t-test, KMO and Bartlett's Test. Further analysis of the test items were done using factor analysis and Cronbach's alpha of the sub scales. The researchers paid much attention to this aspect to ensure the reliability and validity of the data outcome. In addition, a multiple regression was done to identify the determinants of consumers' satisfaction in the mobile service industry.

Results

T-Test and Reliability Analysis of Data

The t – test analysis shown in table 2 displays the means and standard deviations of the various variables used and these indicate the extent to which the respondents disagreed or agreed with the statements in the questionnaire. The mean results of the variables indicate how each statement performed from the 300 respondents' points of view. From the table the

highest means were 3.823 (This network sponsors lots of social programs), 3.6567 (network has nation-wide coverage) and 3.5833 (network has easy internet access and multimedia messaging services) whilst the lowest was 2.5567 (my network uses favourite celebrities as brand icons). This is an indication that though consumers find most telecommunication operators sponsoring social programs, they opinioned that the brand icons of the various brands were not favorite celebrities.

Prior to the extraction of factors, table 3 shows the Bartlett test of Sphericity (Appox: Chi-square= 1274.033, df= 120, p< 0.001) and the KMO measure of sampling adequacy (Value of .815). This confirmed that there was a significant correlation among the variables to warrant the application of exploratory factor analysis. The table below displays the results of the KMO test which was ran for the data obtained from the respondents. The KMO overall statistic of .815 for the variables used in the study gives an indication that there is a higher possibility that there exists an inter-correlation between the variables thereby making them sensible for analysis.

Table 2: T- Test of the statements in the questionnaires

Statement	Mean	Std. deviation	*t*	*df*	ρ
Strong network signal	3.0000	1.17100	44.374	299	.000***
Time of call placement and connection	3.4867	0.93061	64.894	299	.000***
Low call tariffs	2.9367	1.21556	41.845	299	.000***
Nation-wide coverage	3.6567	1.12680	56.208	299	.000***
Low call charges to other networks	2.5100	1.27881	33.996	299	.000***
Fair SMS charges to same network	3.5267	1.10757	55.151	299	.000***
Fair SMS charges to other networks	3.1400	1.18254	45.991	299	.000***
Easy internet and multimedia messaging services	3.5833	1.20328	51.580	299	.000***
Able to determine call charge per call	3.2567	1.32033	42.722	299	.000***
Easy access to customer care	2.8733	1.39659	35.635	299	.000***
Regular call discounts	2.9133	1.67187	30.182	299	.000***
Favourite celebrities as brand icons	2.5567	1.19648	37.011	299	.000***
Sponsors lots of social program	3.8233	1.07827	61.415	299	.000***
No call drops/breakages in calls	2.7067	1.25667	37.306	299	.000***
Voice clarity in calls	3.2533	1.11053	50.741	299	.000***
No call interferences	3.1933	1.19193	46.404	299	.000***

****p < 0.001* ***p < 0.01* **p < 0.05.* *n.s = not significant*

The variable loadings for exploratory factor analysis are considered “high” if they are all .8 or greater (Velicer and Fava, 1998) – but this is unlikely to occur in real data.

Table 3: KMO and Bartlett's Test of the questionnaire

Test		Score
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.815
Bartlett's Test of Sphericity	Approx. Chi-Square	1274.033
	df	120
	ρ	.000***

****p < 0.001*

As a result, Hair, Black, Babin, Anderson and Tatham, (2010) posited that ideally variables should have loadings greater than 0.5 to be retained for analysis. However more common magnitudes in the social sciences are low to moderate variable loadings of above .40. If an item has a loading of less than .40, it may either not be related to the other items, or may suggest an additional factor that should be explored. Costello and Osborne (2005) assert that the researcher may consider why that item was included in the data and decide whether to drop it or add similar items for future research.

Table 4: Reliability of scales for independent variable

• Variables	• Loadings	• Cronbach's alpha
• **Connectivity and Coverage**	•	• **.773**
•		
• Strong network signal	• 671	•
• Time of call placement and connection	• .670	•
• Low call tariffs	• .782	•
• Nation-wide coverage	• .701	•
• **Network charges**	•	• **.790**
• Low call charges to other networks	• .769	•
• Fair SMS charges to same network	• .687	•
• Fair SMS charges to other networks	• .720	•
• **Value Added Services**	•	• **.736**
• Easy internet access and multimedia messaging services	• .692	•
• Able to determine call charge per call	• .752	•
• Easy access to customer care	• .682	•
• **Promotional activities**	•	• **.749**
• Regular call discounts	• .891	•
• Favourite celebrities as brand icons	• .559	•
• Sponsors lots of social	• .697	•

program		
• **Call quality**	•	• **.826**
• No call drops/breakages in calls	• .781	•
• High voice clarity in calls	• .770	•
• No call interferences	• .790	•

However it is worthy to note that these numbers are essentially correlation coefficients, and therefore the magnitude of the loadings can be understood similarly. The loadings used in the analysis table were all high, which indicates that the extracted components represent the variables well. A compilation of the various alpha values are presented in Table 4.

Per the Cronbach's alpha coefficient results, it is clear that all the scales for the independent variables exceeded the minimum acceptable value of 0.7, and thus proved to be reliable for multiple regression analysis.

In addition to the analysis done, a further analysis of the reliability of the scales used for the dependent variables was also assessed and found to be reliable. Table 5 shows these reliability scores of all the variables have high loadings and loaded perfectly on the dependent variable with a very excellent Cronbach's alpha of .878. This is an indication that the statements used for the dependent variable form a complete structure in describing customer satisfaction.

Table 5: Reliability of scales for dependent variable

Variables	Loadings	Cronbach's alpha
Customer satisfaction		**.878**
I am happy with the service provided by this network	.708	
I will patronize other services from this network	.682	
I will recommend this network to friends and family	.753	
I am satisfied with the overall services provided by this network	.765	

Multiple Regression Analysis

multiple regression was used to analyze the relationship between the determinants of consumers' satisfaction of mobile services and overall satisfaction. This was done to extract the independent variables that can better explain the dependent variable. Overall satisfaction was used as the dependent variable whilst the independent variables were represented by Connectivity/coverage, Network charges, Value added services (VAS), Promotional efforts and Call quality. The table 6 presents a summary of the multiple regression least squares results for the dependent and independent variables

Table 6: Multiple regression analysis consumers' satisfaction with mobile service operations

Variables	Beta	S.E	*t*	Sig.
Connectivity/coverage	.199	.062	4.009	.001**
Network charges	.209	.044	4.344	.002**
Value added services	.147	.047	2.845	.005**
Promotional efforts	.180	.047	4.037	.000***
Call quality	.276	.042	5.729	.000***
Std. Error of the Estimate	.42213			
R Square	.514	*F-stats*	62.235	
Adjusted R Square	.506	*Prob.(F-stats)*	.000	
N	300			

****p < 0.001* ***p < 0.01* **p < 0.05.* *n.s = not significant*

The results from the Regression table indicate that there is a strong and significant relationship between the dimensions of service quality and customer loyalty (F= 62.235, $p< 0.01$). The R Square value = .514 indicates that the independent variables explain 51.4% of the variance in overall customer satisfaction with mobile telecommunication services among students of University of Ghana with an Adjusted R-Square of 50.6%. On the individual determinants, Call quality was found to be the most important determinant consumer satisfaction with mobile telecommunication services (β =0.276, t=5.729, $p< 0.001$).This was followed by Network charges (β =0.209, t=4.344, $p< 0.01$). The third determinant is the Promotional activities undertaken by the network providers (β =0.180, t=4.037, $p< 0.001$) whilst Connectivity and coverage followed as the fourth determinant (β =0.199, t=4.009, $p< 0.01$). Finally, Value added services (β =0.147, t=2.845, $p< 0.01$) was found to be the last but not the least determinant of consumer satisfaction of mobile telecommunication services. In this regard, all the dimensions used to measure determinants of mobile telecommunication service satisfaction were found to be positively and statistically significant in determining consumers' satisfaction.

3. Discussion

The mobile telephony market is one of the fastest-growing service segments in telecommunications. More than half of all potential telephone calls worldwide can be made through mobile phones. According to some scholars (Chen et al, 2008; Kuo et al, 2009), this figure was expected to reach more than 85% by the end of 2014, indicating that mobile telephony is poised to surpass fixed telephony as the service most available to potential callers around the globe. The spectacular growth of the mobile market has

been driven not only by innovation in wireless technologies but also by fierce competition among mobile carriers under minimal regulations in sharp contrast to the fixed telephony market. The study examines the determinants of mobile telecommunication service satisfaction among consumers on University of Ghana campus. The results from the multiple regression analysis demonstrated positive relationship between the determinants and the overall satisfaction of the consumers.

the results, the study revealed that there is a positive and significant relationship between call quality and consumer satisfaction. This finding supports the results of previous studies (such as Lim et al, 2006; Eshghi et al, 2007; Pezeshki et al, 2009), who demonstrated that within the mobile telecommunication services, the core elements sought after by consumers from service providers are the ability to make calls without experiencing call drops or breakages, voice clarity during calls and without any interference within the calls. Furthermore, the current study reveals a positive linkage between Network charges (rates of making calls and sending SMS) and consumer satisfaction. This is also in line with earlier literature (see for instance Nysveen et al, 2005; Shin and Kim, 2008) which stress on the fact that consumers demand value for their money and thus their satisfaction levels are in most cases determined by the quality associated with the cost they are paying for the services. In the mobile telecommunication industry, these costs are seen in the rates charged by the network operators both within the same network and also to other competing networks. In several cases, consumers within this industry demand fair competitive network charges for both calls and SMS within and to other networks.

In addition, promotional activities were also found to be positively and significantly related to consumer satisfaction in mobile telecommunication services. This supports findings from studies such as Munnukka (2008) and Lai et al, (2009). Such scholars have postulated that with respect to mobile telecommunication service providers, the high levels of competition within the industry make the adoption of promotional mixes indispensable. Such activities as regular discounts on calls made, sponsoring of popular social programs and the use of favorites celebrities as brand icons among many others. These activities tend to draw both existing and prospective customers into patronizing the services provided by the mobile telecommunications network (Nysveen et al, 2005; Eshghi et al, 2007). Another determinant that exhibited a positive and significant relationship with overall consumer satisfaction of mobile telecommunication services has to do with connectivity and coverage. As put forward by previous studies such as Loo (2004) and Shin and Kim (2008), most customers consider issues such as a network's ability to cover a wider proportion of localities and getting strong signals at all places within the country. Additionally,

consumers expect a reasonable time between placing a call and the actual connection to the receiving party/parties.

Finally, the least determinant of consumer mobile telecommunication satisfaction found from the study was value added services (VAS). These services range from getting easy access to additional services such as internet and multimedia messaging services (MMS), easy access to customer care services and other informative tips on services such as entertainment, sports, lottery etc. Consistent with literature from some scholars (such as Lai et al, 2009), the availability of such services tend to create not only satisfaction but also act as loyalty schemes to keep existing customers whilst attracting new ones. However, it has become a trend that after some time, promotional activities become basic services, which any new subscriber enjoys from their various network providers. Hence mobile telecommunication operators keep introducing newer promotional mixes to attract new customers whilst rewarding existing ones to remind them of the need to remain loyal to their brands.

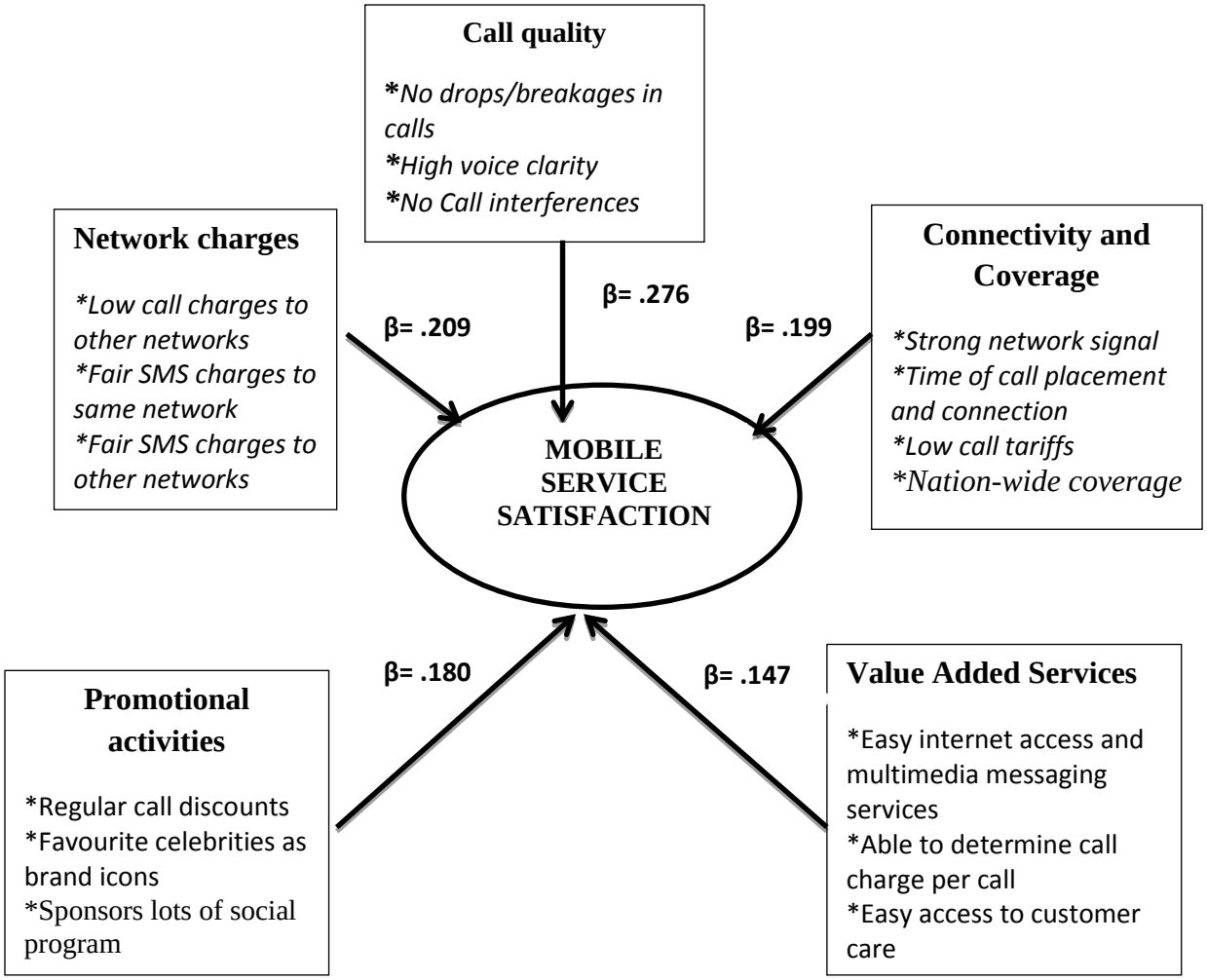
Summary on Model, Independent and Dependent Variables

Initially, using multiple regression analysis, the research model was tested and proven to be statistically significant (F= 62.235, Prob.F-stats <0.001) and 51.4% explanation for the variance in customer satisfaction was explained. Notably, the independent variables in the conceptual model are call quality, value added services, promotional efforts, network charges and connectivity and coverage, while the dependent variable is customer satisfaction. Preliminary considerations made to test the internal consistencies of these scales for the study indicated that they were highly reliable for the analysis (Cronbach's alpha loadings > 0.7).

Further, multiple regression analysis indicated that these dependent and independent variables (i.e. satisfaction indicators) explain a reasonable variance in level of satisfaction of the customers (students) in Ghana. All five satisfaction indicators were found to statistically influence customer satisfaction (i.e. call quality, value added services, promotional efforts, network charges and connectivity and coverage). However, call quality was found to be the most important determinant of consumer satisfaction with mobile telecommunication services ($\beta = 0.276$, t= 5.729, $p< 0.001$).This was followed by Network charges ($\beta =0.209$, t= 4.344, $p< 0.01$). The third determinant is the Promotional activities undertaken by the network providers ($\beta = 0.180$, t= 4.037, $p< 0.001$) whilst Connectivity and coverage followed as the fourth determinant ($\beta = 0.199$, t= 4.009, $p< 0.01$). Finally, Value added services ($\beta = 0.147$, t= 2.845, $p< 0.01$) was found to be the last but not the least determinant of consumer satisfaction of mobile telecommunication services.

The dependent variable; customer satisfaction was operationalized as a blend of consumers' satisfaction with the service, decision to recommend to other friends and relatives and decision to purchase other services of their provider. Additionally, Pearson product-moment correlation analysis was prepared to confirm the hypothesis developed and to ascertain the relationship between the independent variables and the dependent variable. The results revealed that all the independent variables were positively related to the dependent variable –customer satisfaction. They showed positive relationships with correlations, which were significant at both 0.01 and 0.05 levels (2-tailed). This helped to emphasize the usefulness of the developed model in the conducting of research related to the area under current study.

Figure 1: Model of Customer Satisfaction Determinants (Telecommunication Industry)



NB: This model explains approximately 50.6% of the determinants of Customer Telecommunication Service Satisfaction

The usefulness of this study could be used by practitioners in the field of developing and maintaining strong brands to gain insight into how to strengthen their brands using a multiplicity of factors desired by the consumer. For mobile service companies, a very important implication for the findings relates to the call quality because among all the five indicators that were statistically proven to influence consumer customer satisfaction, call quality was found to be the most contributors to satisfaction for consumer users in Ghana. Essentially, an explicit focus must be placed on acquiring equipment and facility that can help improve voice clarity and call breakages. The results also seem to suggest that if service provider can provide quality call services, they may not have problems even if their charges are high.

Although the student population is very small fraction of the population of mobile customers base in Ghana, this segment of customer are however very lucrative and influential in determining other segments patronage. The student customer base is a unique customer niche can be targeted separately with the same marketing offer because the population is youthful, educated and spends a junk of their resources on communicating. As identified by the study the most important satisfaction indicator for this segment of customers is call quality followed by network charges. The service providers should however seek to improve their call quality, be moderate with their charges as well as increase their promotional activities to attract this niche of customers.

Network coverage as an indicator was found to have the least influence on consumers' satisfaction. This goes to inform the service providers that they would rather concentrate on providing a good call quality and concentrate their promotional effort on specific geographic area in order to attract this segment of client. The student customer segment preferred a service provider who delivers a good call quality in addition to attractive promotional offers in specific geographical coverage to one that has a poor call quality and a nation-wide coverage.

Limitations and Practical Challenges

The current research has the following limitations. The scope of the study is limited geographically and numerically in terms of the sample size used for the study. Out of student of about 40,000 students, the researcher could interview only 300 of them.

In addition, the study is limited in terms of time constraints because for a study of this nature, larger samples are required and a considerable amount of time and money is needed to achieve such a target. Despite these inadequacies, the generalizability of the results to the students' population is deemed to be representative with a high confidence.

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