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Application of the Diagnostic Capability of SERVQUAL Model to an Estimation of Service Quality Gaps in Nigeria GSM Industry

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Abstract
This study assessed the quality of service by GSM service providers in Nigeria from the consumer's point of view, and ascertained current overall level of service quality and the existing gaps in service dimensions. The study objective was to ascertain the overall service quality gap and the gaps that may exist in the service quality dimensions. This becomes necessary as a result of the plethora of complaints from GSM subscribers which are symptomatic of an *unhealthy* service environment requiring some level of diagnosis, hence this study. The primary data used for the study were collected through the adoption of a questionnaire prototype designed *a priori* by Parasuraman, Berry and Zeithaml (1988). Purposive, quota and accidental sampling methods were used by dividing Nigeria along the six geo-political zones from where the South-Western zone comprising Oyo, Ondo, Ogun, Ekiti, Osun and Lagos States was selected. Three states within the zone; Lagos, Oyo and Osun, were selected based on convenience. Tertiary institutions within the selected states were purposively targeted with equal number of respondents, bringing the total number of respondents sampled to 300. Tertiary institutions were targeted because of their highly enlightened community of students, staff and other visitors who were able to assess their level of satisfaction with GSM services provided. Data collected were analyzed using descriptive and inferential statistics including tables, frequencies, percentages, and the application of the five dimensionality principle of the SERVQUAL model which has diagnostic capabilities. The study found that the magnitude of the gap between what consumers expect and what they perceive as received is -1.48 (a negative outcome). 'Responsiveness' had the widest gap of -35.93 among the five dimensions, while 'Empathy' had the least gap with a score of -22.15. The study concludes that consumers are dissatisfied with the services received from the GSM service providers and recommends that network providers should work hard to narrow or eliminate the gap observed in the overall quality by improving their service delivery and training their staff.
Keywords: service quality gap, dimensions of service, diagnostic capability, GSM industry, SERVQUAL model.

1. Introduction

Telecommunication is not only important, it has maintained a consistent growth in the last couple of years, and affects almost every facet of our existence. This obviously informed the introduction of GSM mobile telecommunication into the Nigerian market in 2001. Prior to that date, in late 1999 to be precise, the then new democratic Nigerian Government prioritized the development of the telecoms sector, after many years of state investment in fixed lines with little success. The Nigerian authorities then identified private investment in mobile cellular telephony as the best way forward, in the shortest term, to boost teledensity in Nigeria because unlike nations with high teledensities, wireless telephony was a substitute rather than a complement to fixed line technologies in Nigeria (Onwumechili, 2001). As at 2000, Nigeria, with a population of over 120 million people, had one of the lowest teledensity rates in the world at 0.38% while the average teledensity in Africa at that time was 1.98% (ITU, 2001). Also in 2000, Nigeria had only 500,000 main lines (ITU, 2001). This chronic shortage of mainlines was a major impediment to economic development thus necessitating the liberalization of that sector after many years of NITEL's monopoly. It was this liberalization that opened the gates for the entry of the GSM operators such as MTN Nigeria, Globacom, M-Tel (now practically moribund), and Econet (later Celtel, V-Mobile, Zain and now Airtel) each commanding some proportion of the GSM market. Today they share among themselves over 145 million subscribers (NCC, 2014).

After the initial euphoria of the GSM debut in Nigeria, some problems, which border largely on service quality began to rear their ugly heads. Thirteen years down the line, several issues have cropped up, the operational environments have changed and fierce competition has taken over. This calls for some form of *stock taking* with a view to determining how the industry has fared in the perception of the Nigerian consumers since mobile (GSM) customers are increasingly becoming sophisticated, educated and demanding, coupled with persistent competition which put pressure on the operators to deliver existing services such as coverage, voice call quality, call continuity, call blocking, SMS (short message service), data transfer speed, etc, in a very reliable and consistent manner. The services offered by GSM operators in Nigeria can be gauged by the plethora of complaints by subscribers which are symptomatic of the level of service quality but do not reveal the quality talk much less indicate the existing gaps. The followings represent a glimpse of these complaints:

i. Incessant traffic congestion such that calls are either delayed or disconnected abruptly.

ii. Inability to make or receive calls sometimes when seriously needed.
iii. Fuzzy conversations as a result of low/bad voice clarity.
iv. Wrong or improper billing of customers.
v. Delayed response or outright lack of response to customers' complaints.
vi. Aggressive or impersonal/impolite responses from personnel of the Customer care sections of the GSM operators especially in solving call or billing problems.
vii. Unsolicited SMS's (short message systems) or undelivered messages even when mostly needed.
viii. Exorbitant tariffs including call rates and other charges.
ix. Non-functional or low coverage masts in several locations including overloading of existing ones.
x. Majority of the GSM subscribers in Nigeria appear to be dissatisfied with current levels of services, such that they are forced to own more than one network and/or handsets with attendant cost implications.

These complaints derive from the fact that in service delivery, every interaction is 'a moment of truth' (Kotler, 2004) since consumers compare ex ante expectations of service to be provided with ex post perceptions of the service delivered such that customer satisfaction or dissatisfaction results from the difference between the two. Besides, consumer complaints are about the broadest gauge of the quality of a service offered by a service provider which in turn affects customer satisfaction directly or indirectly. If service providers' aims of improving service quality are to be effective therefore, organizations must understand the specific constructs underlying service quality measurement and be able to adapt them to the specific service sector in which they operate. To this end, the GSM operators in Nigeria need to *understand* the important roles played by the *quality* of their services from the customers' point of view, be able to measure it and be able to operationalize the outcome of such measurement. This *diagnosis* that will provide managerial insights for corrective actions in the event of quality shortfalls appears to be missing currently in the industry, hence this study.

2. Theoretical Framework and Literature Review

2.1 Theoretical Framework

Two major approaches to the measurement of service quality have been identified in the literature and have been applied across a wide spectrum of services and service firms. Each of these approaches has its strengths and weaknesses as there is no consensus yet as to which is superior to the other. The choice of one over the other appears to be situation-specific. The two major approaches are SERVQUAL and SERVPERF.

2.1.1 The SERVQUAL Scale

The foundation for the SERVQUAL scale is the gap model proposed by Parasuraman, Zeithaml and Berry (1985, 1988). It is rooted in a disconfirmation paradigm which implies that the model is fashioned to show that consumers most time have prior expectation of the quality of service to be received before actually receiving the service. The authors maintain that satisfaction is related to the size and direction of disconfirmation of a person's experience *vis-à-vis* his/her initial expectations (Parasuraman, Zeithaml and Berry, 1985; Smith and Houston, 1982). As a gap or difference between customer 'expectations' and 'perceptions,' service quality is viewed as lying along a continuum ranging from 'ideal quality' to 'totally unacceptable quality,' with some points along the continuum representing satisfactory quality. The authors also suggest that when perceived or experienced service is less than expected service, it implies less than satisfactory service quality. But when perceived service is less than expected service, the obvious deduction is that service quality is more than satisfactory. They conclude by claiming that while a negative discrepancy between perceptions and expectations (a 'performance-gap' as they call it) causes dissatisfaction, a positive discrepancy leads to consumer delight.

SERVQUAL is based on a set of 22 variables/items covering five different dimensions of service quality namely:

A. Tangibles (four items)
1. Firm has modern-looking equipment
2. The physical facilities are visually appealing
3. Employees are neat-appearing
4. Materials associated with the service are visually appealing

B. Reliability (five items)
5. When the firm promises to do something by a certain time, it does so
6. When a customer has a problem, the firm shows a sincere interest in solving it
7. The firm performs the service right the first time
8. Services are provided at the time the firm promises to do
9. The records are error-free

C. Responsiveness (four items)
10. Employees tell customers when services will be performed

11. Employees give prompt service to customers
12. Employees are willing to help customers
13. Employees are never too busy to respond to customer's requests

D. Assurance (four items)

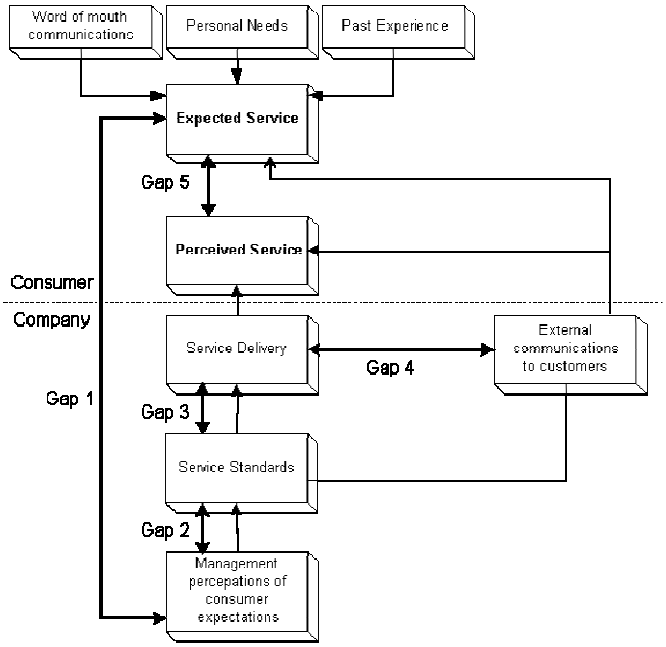
14. The behaviour of employees instill confidence in customers
15. Customers feel safe in their transactions
16. Employees are consistently courteous
17. Employees have the knowledge to answer customer's questions

E. Empathy (five items)

18. Firm gives individual attention to the customer
19. Employees give personal attention to customers
20. Firm understands specific needs of its customers
21. Firm has customer's interest at heart
22. Operating hours are convenient to all customers

The 22 items are in pairs: one set of each pair assessing the customer's expectations, the other assessing perceptions of service quality; yielding a total of 44 items for questionnaire development. Service quality is thus determined by calculating the difference between expectations and perceptions for each item. This aspect of the administration of SERVQUAL has been criticized on the grounds that there is a lack of evidence supporting the expectation-performance gap as a predictive measure of service quality (Cronin, Steven and Taylor, 1992). Other researchers suggest that the calculation of difference scores could result in poor reliability (Brown, Churchill, and Peter, 1993). The SERVPERF or other scales may appear appealing for assessing overall service quality of a firm because of their parsimoniousness, and for comparisons across service industries, however, when the research objective is to identify areas of service quality shortfalls for possible managerial intervention (as in this study), the SERVQUAL scale, and the service-gap theory**,** is preferred because of its superior diagnostic capability (Sanjay and Garima, 2004).

Figure 1: SERVICE QUALITY GAP MODEL



Source: Parasuraman, Zeithaml and Berry (1985), "A conceptual model of service quality and its implication for future research".

2.2 The Concept of Quality

Quality is a major concern of every organization and consumer because it represents a measure of value that consumers get for their money, time, and effort, and because it has direct impact on the short and long-term survival of an organization. In fact quality has come to be recognized as a strategic tool for attaining operational efficiency and improved business performance (Anderson and Zeithaml, 1984; Babakus and Boller, 1992; Garvin, 1983; Phillips, Chang and Buzzell, 1983). Despite this significance, defining quality is yet a very 'slippery' exercise. For instance, Perreaut et al. (2009) define quality as "a product's ability to satisfy a

customer's needs or requirements.", Crosby (1984) defines it as 'conformance to requirements', while other definitions include "fitness for use" (Juran, 1988), "one that satisfies the customer" (Eiglier and Langeard, 1987). Quality may summarily be viewed as "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs." "…this is a **customer-centered** (our emphasis) definition of quality." (Kotler, 1997). A firm will be deemed to have delivered quality service therefore whenever its products or services meet or exceed customers' needs most of the time. In other words, either where there are no gaps or preferably where the gaps are positive.

2.3 The Criticality of Service Quality to the Service Industry

Leading service providers see quality as a strategic tool. By delivering excellent quality these companies receive benefits including increased growth through improved customer retention and increased customer acquisition (Ferguson and Zawacki, 1993; Buzzell and Gale, 1987). Service quality as a concept has aroused considerable interest and debate in the research literature because of the difficulties in both defining and measuring it with no overall consensus emerging on either (Wisniewski, 2001). It has therefore proved to be an elusive construct that is difficult to define and to measure (Cronin and Taylor, 1992; Parasuraman, Zeithaml, and Berry, 1985, 1988). There are a number of different "definitions" as to what is meant by service quality.

One definition that is commonly used sees service quality as the extent to which a service meets customers' needs or expectations (Lewis and Mitchell, 1990; Dotchin and Oakland, 1994; Asubonteng *et al*, 1996; Wisniewski and Donnelly, 1996). Service quality can thus be defined as the difference between customer expectations of service and perceived service. Parasuraman, et al. (1985), define service quality as the gap between customers' expectations and perceptions. If expectations are greater than performance, then perceived quality is less than satisfactory and hence customer dissatisfaction occurs, and vice-versa (Parasuraman *et al*, 1985; Lewis and Mitchell, 1990).

2.4 Dimensionality of Service Quality

To measure service quality, Parasuraman, et al (1985) first identified the dimensions of service quality. These were identified through extensive focus groups and refined through statistical analysis of a pilot instrument. The resultant five dimensions are:

1. ***Reliability***: The ability to perform a promised service dependably and accurately
2. ***Responsiveness***: A willingness to help customers and to provide support services
3. ***Assurance***: The knowledge and courtesy of employees and their ability to inspire trust and confidence
4. ***Empathy***: The caring, individualized attention a firm provides its customers
5. ***Tangibles:*** The physical facilities, equipment, and appearance of personnel.

Although Cronin and Taylor (1992) suggest a different service quality construct, they nonetheless sustained the five dimensions of the model by Parasuraman et al. In fact, the universality of the five dimensions of SERVQUAL and SERVPERF continue to be one of the major areas of their criticisms. Several researchers have asked whether the suggested domains are consistent. They claim that many empirical applications fail to recover the five dimensions and suggest their modification (Babakus and Boller, 1992; Carman, 1990; Cronin and Taylor, 1992; Parasuraman et al., 1994a). Despite these criticisms, the two measurement scales continue to wax strong in popularity.

3. Methodology

The over 145 million subscribers of GSM services (NCC, 2013) spread across the 36 States and the FCT of Nigeria, and shared among the four major GSM service providers in Nigeria (MTN, GLOBACOM, AIRTEL and ETISALAT) are the target population of this study. But as a result of the largeness, pervasiveness and heterogeneity of the research population, Nigeria was divided along the six geo-political zones: the North-East, North-West, North-Central, South-West, South-East, and South-South. The South-West zone comprising Oyo, Ondo, Ogun, Ekiti, Osun and Lagos States was selected. Tertiary institutions in the following cities within the zone were purposively targeted as follows: Lagos (Lagos State University), Ibadan (The Polytechnic, Ibadan), Ile-Ife (Obafemi Awolowo University). The choice of tertiary institutions within the zone was predicated on the need to target respondents that are literate enough to answer the questions raised in the questionnaire. Besides, the tertiary institutions have the highest aggregation of literate phone users who also come from different regions of Nigeria.

A total of 300 (Three hundred) respondents were sampled using purposive, quota and accidental sampling methods as follows: Lagos State University (100 respondents), The Polytechnic, Ibadan (100 respondents), Obafemi Awolowo University, Ile-Ife (100 respondents). The respondents were served with the questionnaire in order to elicit the data that are required for the study. The questionnaire followed that originally

designed by Parasuraman et al (1988) with slight modifications to suit the peculiarities of the Nigerian GSM industry. The data were analyzed using both descriptive and inferential statistical tools. The descriptive tools include percentages, frequency tables, and inferential statistics particularly the 'Gap Analysis' based on the SERVQUAL model, which has been designed *a priori* by Parasuraman, Zeithaml and Berry (1985, 1988), and has been discussed extensively in previous sections of this study.

4. Results and Discussions

The research instrument comprised of two sections; A and B. The subsection of section 'A' on expectation contains twenty-two questions which sought to measure subscribers' expectation from the five dimensions of service quality. The subsection on perception also contains twenty-two questions which sought to measure subscribers' perception of the five dimensions of service quality. A total of three hundred (300) questionnaire copies were distributed to the subscribers of the GSM network providers. Of this number, two hundred and eighty-two (282) copies, representing 94% were retrieved. The data gathered were analyzed with the aid of the Statistical Package for Social Sciences (SPSS).

4.1 *The Overall Service Quality Gap Estimation Based on the SERVQUAL Scale*

Quality is a function of expectation and perception. In other words, Q=f(E,P). We define service quality as the difference between customer's expectation of a service provision on the one hand, and the perception of the delivered service on the other. In order to determine whether or not there is a gap between customers' perception and expectation of service, we used the formula,

$$SQ = P - E$$

Where: SQ is the quality of the service,
P is the customers' perception of the delivered service, and
E is the customer's expectation of the service.

In an equation form, overall service quality (OSQ) can be expressed as follows:

$$SQ_i = \sum_{j=1}^{k} (P_{ij} - E_{ij}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

where: SQ_i = perceived service quality of individual 'i'
k = number of service attributes/items
P = perception of individual 'i' with respect to performance of a service attribute 'j'
E = service quality expectation for attribute 'j' that is the relevant norm for individual 'i'

When summed across all respondents, the overall quality of service for the industry was obtained thus:

$$OSQ = \sum_{j=1}^{k} \left(\frac{P_{ij}}{n} - \frac{E_{ij}}{n}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

where: OSQ = Overall Service Quality for the industry (GSM)
k = number of service attributes/items (which is 22)
P = overall perception of respondents with respect to performance of a service firm attribute 'j' (2 pairs of 22 attributes)
E = overall service quality expectation for attribute 'j' (2 pairs of 22 attributes)
n= number of respondents (282)

Therefore, we have:

$$OSQ = \sum_{j=1}^{22} \left(\frac{P_j}{282} - \frac{E_j}{282}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(3)}$$

Extracting the individual means for Perception and Expectation from Tables 4.1 and 4.2, and substituting in equation (3),

$$OSQ = (4.53+4.41+4.33+4.39+4.27+4.10+4.33+4.17+4.33+4.02+4.13+3.97+3.80+4.32+4.26+4.43+4.56+4.30+4.16+4.02+3.98+4.22) - (5.74+5.69+6.11+5.91+6.03+5.73+5.92+5.92+6.15+5.88+6.16+4.97+5.13+5.82+5.93+6.24+5.93+5.62+5.11+5.35+5.23+5.06)$$

$$= \frac{(93.03)}{22} - \frac{(125.6)}{22}$$

$$= 4.23 - 5.71$$
$$= -1.48$$

This indicates that the quality of service provided by the network operators in the Nigerian GSM industry is negative; lower than what consumers expect and desire. On the whole therefore, there is a gap (-1.48)

in the services offered by the network providers. With an overall mean value of 4.23 for perception and 5.711 for expectation (see Table 4.3), it is evident that the quality of service in the GSM industry in Nigeria falls below consumers' expectation. The standard deviation values of .65 and .80 for expectation and perception respectively, suggest that the individual ratings greatly converge around the means and help to further reinforce the inference. The Paired Samples correlation coefficient of .180 (see Table 4.4) indicates a weak relationship between the overall score for expectation and that of perception. There is however a significant difference between the overall scores for perception and expectation on a 95% degree of confidence with a significance value of .000 ($p<0.05$), (see Tables 4.4 and 4.5). The Paired Samples test was adopted for the analysis as a result of the manner in which the research instrument is structured, containing two broad sections, with each testing the same set of attributes. Thus, the data obtained were treated as two separate but related sets (see Olujide and Mejabi, 2007).

Table 4.1: Mean and Median Values for Expectation

VARIABLES	Codes	Mean	Median	Std. Deviation	Variance
Modern looking equipment	E1	5.74	7	1.712	2.931
Visually appealing physical facilities	E2	5.69	6	1.579	2.492
Employees' appearance	E3	6.11	7	1.350	1.823
Visually appealing materials such as logos, recharge card design	E4	5.91	6.5	1.504	2.262
Promises are fulfilled	E5	6.03	7	1.441	2.077
Sincere interest in solving customers' problems	E6	5.73	6	1.682	2.829
Performing services right the first time	E7	5.92	7	1.543	2.381
Provision of services as at when promised	E8	5.92	7	1.566	2.452
Insistence on error-free records	E9	6.15	7	1.385	1.918
Informing customers exactly when services will be performed	E10	5.88	7	1.564	2.445
Provision of prompt, efficient services to customers	E11	6.16	6	1.270	1.613
Employees' willingness to help customers	E12	4.97	6	1.831	3.352
Employees never being too busy to attend to customers' requests	E13	5.13	6.5	1.859	3.455
Employees' behaviour instill confidence in customers	E14	5.82	7	1.558	2.429
Customers feeling safe in transactions	E15	5.93	7	1.456	2.120
Employees' courtesy with customers	E16	6.24	7	1.251	1.564
Employees' knowledge at answering customers' questions	E17	5.93	6	1.506	2.269
Individual attention given to customers	E18	5.62	6	1.696	2.876
Operating hours convenient to all customers	E19	5.11	6	1.702	2.895
Employees give customers personal attention	E20	5.35	6	1.731	2.997
Having customers' best interest at heart	E21	5.23	6	1.769	3.130
Employees understand the specific needs of customers	E22	5.06	6	2.065	4.263

Source: Research Data

Table 4.2: Mean and Median Values for Perception

VARIABLES	Codes	Mean	Median	Std. Deviation	Variance
Modern looking equipment	P1	4.53	5	1.862	3.467
Visually appealing physical facilities	P2	4.41	5	1.768	3.126
Employees' appearance	P3	4.33	5	1.616	2.612
Visually appealing materials such as logos, recharge card design	P4	4.39	5	1.663	2.765
Promises are fulfilled	P5	4.27	5	1.721	2.961
Sincere interest in solving customers' problems	P6	4.10	4	1.830	3.350
Performing services right the first time	P7	4.33	5	1.614	2.605
Provision of services as at when promised	P8	4.17	4	1.731	2.996
Insistence on error-free records	P9	4.33	4	1.528	2.334
Informing customers exactly when services will be performed	P10	4.02	5	1.736	3.014
Provision of prompt, efficient services to customers	P11	4.13	4	1.774	3.146
Employees' willingness to help customers	P12	3.97	4	1.909	3.643
Employees never being too busy to attend to customers' requests	P13	3.80	4	1.812	3.282
Employees' behaviour instill confidence in customers	P14	4.32	5	1.605	2.575
Customers feeling safe in transactions	P15	4.26	4	1.634	2.669
Employees' courtesy with customers	P16	4.43	5	1.714	2.937
Employees' knowledge at answering customers' questions	P17	4.56	5	1.589	2.524
Individual attention given to customers	P18	4.30	5	1.785	3.185
Operating hours convenient to all customers	P19	4.16	4	1.789	3.200
Employees give customers personal attention	P20	4.02	4	1.818	3.305
Having customers' best interest at heart	P21	3.98	4	1.969	3.879
Employees understand the specific needs of customers	P22	4.22	4	2.130	4.535

Source: Research Data

Table 4.3: Paired Samples Statistics of overall scores of Perception and Expectation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	OVERALL SCORE (EXPECTION)	5.7110	282	.64639	.03849
	(PERCEPTION)	4.2289	282	.79663	.04744

Source: Research Data

Table 4.4: Paired Samples Correlations of Overall Scores of Perception and Expectation

		N	Correlation	Sig.
Pair 1	OVERALL SCORE (EXPECTION) and OVERALL SCORE (PERCEPTION)	282	.180	.002

Source: Research Data

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.5: Paired Samples t-Test of overall scores of Perception and Expectation f

	Paired Differences					t	Df	Sig.(2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Upper	Lower			
Pair 1 Overall (EXPECTION) – Overall (PERCEPTION)	1.48	.931	.055	1.372	1.591	26.73	281	.000

Source: Research Data

4.2. Diagnosis of the Five Dimensions of Service Quality

The five dimensions are:

1. ***Tangibles:*** The physical facilities, equipment, and appearance of personnel.
2. ***Reliability***: The ability to perform a promised service dependably and accurately
3. ***Responsiveness***: A willingness to help customers and to provide support services
4. ***Assurance***: The knowledge and courtesy of employees and their ability to inspire trust and confidence
5. ***Empathy***: The caring, individualized attention a firm provides its customers

For the analysis, items nos 1-4, (that is E1, E2, E3 and E4 as well as P1, P2, P3 and P4) were grouped together and classified as *Tangibles*, items nos 5-9, (that is E5, E6, E7, E8 and E9 as well as P5, P6, P7, P8 and P9) were grouped together and classified as *Reliability*, items nos 10-13, (that is E10, E11, E12 and E13 as well as P10, P11, P12 and P13) were grouped together and classified as *Responsiveness*, items nos 14-17, (that is E14, E15, E16 and E17 as well as P14, P15, P16 and P17) were grouped together and classified as *Assurance*, while items nos 18-22, (that is E18, E19, E20, E21 and E22 as well as P18, P19, P20,P21 and P22) were grouped together and classified as *Empathy*. These groupings are shown in table 4.6a, while Table 4.6b presents the mean score for each of the service dimensions. A one-way ANOVA of the overall scores for the service dimensions indicates that there are significant differences in the mean scores of the dimensions with P-value <0.05 for all of them (see Table 4.7).

Due to the identical nature of the pair of attributes, and the dimensions of the service quality, consumers' responses were subjected to the Wilcoxon signed-rank test in order to determine the scores of each dimension in terms of expectation and perception. The Wilcoxon signed-rank test is a nonparametric alternative to a paired samples t-test. The absolute differences between the variables are ranked and the ranks are split into three groups: *Negative ranks* contain those cases for which the value of the second variable exceeds the value of the first variable, *Positive ranks* contain those cases for which the value of the first variable exceeds the value of the second variable, and *Ties* which contain cases for which the two variables are equal. If the two variables do not differ, the sum of the positive ranks will approximately equal the sum of the negative ranks. The sum of the ranks for the less frequent sign is the statistic used in the test.

The Wilcoxon rank test gives a deeper understanding of the comparison of consumers' expectation and perception of service dimension as it compares the pairs on case-by-case basis. The data as presented in Table 4.8 show that while respondents rated tangibles (E1) above tangibles (P1) 225 times, they rated (E1) below (P1) only 43 times, and rated them equally in 14 instances. This means that consumers expect more than they have received in terms of the physical evidences of the network operators. In the same vein, consumers rated (E2) above (P2) 243 times, (E2) below (P2) only in 32 instances, and tied only in 7 cases. This means that consumers expect more than they have received in terms of reliability of the service providers. Also, consumers rated (E3) above (P3) 232 times, (E2) below (P2) only in 39 instances, and tied only in 11 cases. This also means that consumers expect more than they have received in terms of responsiveness of the service providers to their needs. The table also indicates that consumers rated (E4) above (P4) 234 times, (E4) below (P4) only in 32 instances, and tied only in 16 cases. This means that consumers expect more than they have received in terms of assurance of services provided. Expectation on empathy (E5) was ranked above its perception (P5) in 207 instances as against its superior rating only in 59 cases. They were rated equal in 16 instances. Consumers therefore demonstrate that they have received far less than they anticipated in terms of empathy from the telecommunication firms.

The sum of the ranks and the mean ranks show that expectations far outweigh perceptions in all the five dimensions, with significance values of .000 (<.05) indicating that the two variables are statistically different (Table 4.9).

Table 4.6a: Grouping Service Attributes into the five dimensions of service quality

S/N	DIMENSIONS	ATTRIBUTES	Expectation Codes	Perception Codes
1	**TANGIBLES**	Modern looking equipment	E1	P1
		Visually appealing physical facilities	E2	P2
		Employees' appearance	E3	P3
		Visually appealing materials such as logos, recharge card design	E4	P4
2	**RELIABILITY**	Promises are fulfilled	E5	P5
		Sincere interest in solving customers' problems	E6	P6
		Performing services right the first time	E7	P7
		Provision of services as at when promised	E8	P8
		Insistence on error-free records	E9	P9
3	**RESPONSIVENESS**	Informing customers exactly when services will be performed	E10	P10
		Provision of prompt, efficient services to customers	E11	P11
		Employees' willingness to help customers	E12	P12
		Employees never being too busy to attend to customers' requests	E13	P13
4	**ASSURANCE**	Employees' behaviour instill confidence in customers	E14	P14
		Customers feeling safe in transactions	E15	P15
		Employees' courtesy with customers	E16	P16
		Employees' knowledge at answering customers' questions	E17	P17
5	**EMPATHY**	Individual attention given to customers	E18	P18
		Operating hours convenient to all customers	E19	P19
		Employees give customers personal attention	E20	P20
		Having customers' best interest at heart	E21	P21
		Employees understand the specific needs of customers	E22	P22

Source: Research Data

Table 4.6b: Group Means for the Five Pairs of Dimension of Service Quality

Dimensions	N	Mean	Std. Deviation	Minimum	Maximum
E1-Tangibles	282	**5.86**	.86397	3.00	7.00
E2-Reliability	282	**5.95**	1.12656	1.80	7.00
E3-Responsiveness	282	**5.54**	1.02862	2.25	7.00
E4-Assurance	282	**5.98**	.93995	3.00	7.00
E5-Empathy	282	**5.28**	1.27265	1.00	7.00
P1-Tangibles	282	**4.42**	1.16588	1.00	7.00
P2-Reliability	282	**4.24**	1.04123	1.00	6.40
P3-Responsiveness	282	**3.98**	1.31558	1.00	6.75
P4-Assurance	282	**4.40**	1.10631	1.00	6.75
P5-Empathy	282	**4.14**	1.36669	1.00	7.00

Source: Research Data

Table 4.7. : One-way Analysis of Variance (ANOVA) of the overall scores of the Service Dimensions

Dimensions		Sum of Squares	df	Mean Square	F	Sig.
OS Tangibles	Between Groups	231.892	72	3.221	2.001	.000
	Within Groups	336.451	209	1.610		
	Total	568.342	281			
OS Relationship	Between Groups	270.004	72	3.750	2.059	.000
	Within Groups	380.708	209	1.822		
	Total	650.712	281			
OS Responsiveness	Between Groups	300.303	72	4.171	2.182	.000
	Within Groups	399.470	209	1.911		
	Total	699.773	281			
OS Assurance	Between Groups	216.599	72	3.008	1.907	.000
	Within Groups	329.628	209	1.577		
	Total	546.227	281			
OS Empathy	Between Groups	246.137	72	3.419	1.693	.002
	Within Groups	422.094	209	2.020		
	Total	668.231	281			

Source: Research Data

Table 4.8: Paired Comparison of Consumers Rating of Service Attributes for Expectation and Perception

DIMENSIONS	RANKS	N	Mean Rank	Sum of Ranks
P1-Tangibles - E1-Tangibles	Negative Ranks	225(a)	149.39	33612.00
	Positive Ranks	43(b)	56.60	2434.00
	Ties	14(c)		
	Total	282		
P2-Reliability - E2-Reliability	Negative Ranks	243(d)	146.57	35616.00
	Positive Ranks	32(e)	72.94	2334.00
	Ties	7(f)		
	Total	282		
P3-Responsiveness – E3-Responsiveness	Negative Ranks	232(g)	147.19	34149.00
	Positive Ranks	39(h)	69.41	2707.00
	Ties	11(i)		
	Total	282		
P4-Assurance - E4-Assurance	Negative Ranks	234(j)	145.01	33932.00
	Positive Ranks	32(k)	49.34	1579.00
	Ties	16(l)		
	Total	282		
P5-Empathy - E5-Empathy	Negative Ranks	207(m)	148.04	30643.50
	Positive Ranks	59(n)	82.50	4867.50
	Ties	16(o)		
	Total	282		

Source: Research Data

Table 4.9: Wilcoxon Test Statistics for Paired Comparison of Consumers Rating of Service Attributes

	P1-Tangibles - E1-Tangibles	P2-Reliability - E2-Reliability	P3-Responsiveness - E3-Responsiveness	P4-Assurance - E4-Assurance	P5-Empathy - E5-Empathy
Z	-12.283(a)	-12.611(a)	-12.182(a)	-12.888(a)	-10.268(a)
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000

Source: Research Data
a Based on positive ranks.

5. Conclusions

The gap model and SERVQUAL instrument are shown to have both content validity and reliability as they were able to pinpoint the areas of GSM services delivery in Nigeria that require management attention. This has replicated the empirical results of other studies that have applied the model to a study of other service industries. GSM telecommunication service quality, from the customers' point of view can be effectively measured using the questionnaire items based on the service attributes partitioned along the five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy.

The dimension with the best quality is 'empathy' having recorded the least gap while 'reliability' is regarded as having the lowest service quality having recorded the widest gap. Managers of telecommunication firms, having identified consumers' rating and opinions about their provided services, need to create modifications and strengthen their weak points to increase satisfaction level among their consumers. This can be achieved by focusing on the attributes listed under 'reliability' dimension. The specific service attribute which recorded the widest gap is 'provision of prompt, efficient services to customers' which is a subset of the 'responsiveness' dimension.. The service attribute with the least gap is 'employees understand the specific needs of customers' which is a member of the "Empathy" dimension.

5.1 Recommendations

Primarily, from the findings of this study, it can be inferred that consumers of GSM services are not satisfied with the perceived services and this warns managers to focus on subscribers' expectations. Network providers should gain more information about consumers'' attitude and prepare plans to improve their services almost on all fronts, paying greater attention to the very weak areas. It is therefore recommended that managers should try to improve on the attributes that constitute 'responsiveness' first. Responsiveness consists of employees of the GSM firm telling customers *exactly* when services will be performed, employees giving customers prompt service, employees always willing to help customers and, employees never being too busy to respond to customers' request.

Completing various telecommunication services accurately such as voice call, short messaging (SMS), internet browsing among others, is what consumers expect in the first instance, and to be attended to as promptly as possible whenever the need arises. GSM service providers should reduce delay, technical faults and security, as well as improve on 'customer services'.

Next to 'responsiveness,' in terms of performance, is 'Reliability,' and operators should also pay serious attention to this. Reliability consists of: doing something by a certain time as promised, showing a sincere interest in solving customers' problems whenever they arise, performing services right the first time, providing services at the time they are promised and, insisting on error free records.

GSM services providers need some investments on tangibles. Managers should not withhold visually appealing equipments in facility locations, offices and staff appearances. In other words, efficiency is what GSM companies in Nigeria require and this can be achieved by doing things in the right way.

The focus of this study is the fifth gap (Gap 5) in the SERVQUAL gap model. As the final or last gap, it indirectly represents the most important gap by including the previous gaps. As a result, the following broad strategies are recommended for reducing the gap that exists in the industry as deduced from this study:

1. Ensure all the necessary strategies of reducing other Gaps are put in place or implemented in order to ensure service quality delivery.
2. Ensure that all five generic dimensions of service quality are emphasized whenever services are being delivered to the external customers.
3. Ensure frequent survey (perhaps with SERVQUAL) to determine the expectations, perceptions and satisfaction of customers in order to make adjustments or corrective measures where necessary and to adapt services to suit changes in customers' needs and wants as they occur.

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