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The Impact of Network Coverage On Customer Satisfaction. Case Study: Cameroon Telecommunication (CAMTEL) Kumba Branch

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Abstract

This study examined the relationship between network coverage and customer satisfaction among CAMTEL subscribers in Kumba Municipality, Cameroon. A quantitative research approach with a causal research design was adopted. Data were collected using structured questionnaires administered to a sample of 200 respondents selected from an accessible population of 400 CAMTEL subscribers using stratified random sampling. The data were analysed using SPSS, employing descriptive statistics, Pearson Product Moment Correlation, and multiple regression analysis to test the relationships between variables and the stated hypotheses. The findings revealed that technological network coverage has a strong negative and significant relationship with customer satisfaction ($r = -0.892$, $p < 0.001$), indicating that poor technological infrastructure negatively affects satisfaction levels. Similarly, geographical network coverage also showed a strong negative and significant relationship with customer satisfaction ($r = -0.784$, $p < 0.001$), reflecting widespread dissatisfaction due to uneven network distribution, particularly in suburban and rural areas. In contrast, service-based network coverage demonstrated a strong positive and significant relationship with customer satisfaction ($r = 0.684$, $p < 0.01$), suggesting that improvements in voice, data, and broadband services contribute positively to customer experience. Regression analysis further showed that network coverage dimensions collectively explain a significant proportion of the variation in customer satisfaction, with service-based coverage contributing positively while technological and geographical coverage negatively influence satisfaction. The study concludes that customer satisfaction among CAMTEL subscribers in Kumba is significantly influenced by network coverage, though gaps in technological infrastructure and geographical accessibility limit overall satisfaction. While improvements in service-based network coverage are recognized, they have not fully translated into customer loyalty due to concerns about value for money and service consistency. Based on the findings, the study recommends that CAMTEL should prioritize upgrading its technological infrastructure, particularly 4G and fibre-optic services, expand network coverage to underserved rural and suburban areas, and enhance the consistency of service delivery. Additionally, the company should review its pricing strategies to improve perceived value, strengthen customer service, and implement customer retention initiatives. These measures will help bridge the gap between service improvements and customer expectations, ultimately enhancing satisfaction and loyalty among subscribers in Kumba Municipality.

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Keywords: Network Coverage, technological network coverage, geographical network coverage, service-based network coverage, fibre-optic

1 Introduction

Historically, the telecommunications landscape in Cameroon has undergone substantial transformation over the past few decades, and the evolution of CAMTEL is central to that shift. The company was officially established by Presidential Decree No. 98/198 on 8 September 1998, a merger of the former Directorate of Telecommunications of the Ministry of Posts and Telecommunications and the public enterprise INTELCAM (Osidimbea, n.d. Camtel, 1998; ARMP, n.d.). As the national incumbent operator, CAMTEL was given the mandate to manage fixed-line telephony, international communications, and later to expand into mobile and broadband services (Camtel, 1998).

In its early years, CAMTEL's network coverage was heavily rooted in landline and analog infrastructure, with voice and fixed-line telephony being the dominant services (AERC Africa, 2005). As competitive pressures and technological advancement intensified, the company embarked on digitization and expansion. For instance, by 2005 CAMTEL launched its mobile CDMA service (CT Phone) and began converting its analog exchanges to digital systems, signalling a crucial shift in network coverage capacity and service provisioning (Camtel, 2005). A key milestone occurred around 2010 when CAMTEL significantly expanded its optical fibre backbone network linking the ten regions of Cameroon and connecting into submarine cables thus bolstering its ability to deliver widespread data services and inter-region connectivity (Taghizadeh et al., 2023)

The liberalization of the telecommunications sector in Cameroon also impacted CAMTEL's positioning. Mobile telecom licenses were introduced, and major private operators entered the market, pushing CAMTEL to re-evaluate its strategic differentiation (AERC Africa, 2010). In March 2020, CAMTEL obtained concession agreements to operate in the fixed, mobile, and transport sectors marking a new era in its operational scope (Cameroon Business Today, 2020). Concurrently, CAMTEL launched its mobile brand Blue in August 2021, covering both voice and data services (3G/4G), with plans to expand its mobile footprint nationwide by 2025 (Taghizadeh et al., 2023)

In terms of network coverage, CAMTEL presently controls the national fibre-optic backbone (around 12,000 km), covering approximately 90% of the country's departments, and continues to invest in extending fibre-to-the-home (FTTH) and expanding its mobile network (The Africa Business Index, 2022). The evolution of its network coverage from basic fixed-line services to mobile CDMA, optical fibre, and 4G mobile services reflects a trajectory of technological advancement and infrastructure deepening.

Nevertheless, despite these expansions, CAMTEL continues to face challenges related to service reach and quality. Being the incumbent did not automatically guarantee dominance in the mobile segment; for example, CAMTEL's mobile operations were partially divested when its mobile subsidiary was sold to MTN Cameroon in 2000 (APC, 2008). Moreover, while the fibre backbone network is extensive, the actual "last-mile" coverage in some rural and remote locations remains uneven, affecting uniformity of network coverage and

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potentially the customer satisfaction of users in less-connected areas (The Africa Business Index, 2022).

Thus, the historical perspective of CAMTEL's network coverage is critical for understanding its present footing in the telecom market and frames the integrity of the relationship between network coverage and customer satisfaction. In the specific context of the Kumba branch, it becomes essential to link how these historical developments have shaped the local network infrastructure, the reach of services (voice, data, broadband), and the expectations of customers. The legacy of infrastructure investment, regulatory change, and technological rollout underpins the current network coverage every increment in coverage and every gap in service has implications for customer satisfaction. Therefore, a clear grasp of CAMTEL's historical coverage evolution provides the backdrop against which this study can effectively assess the impact of network coverage on customer satisfaction at the Kumba branch (Wang et al., 2014).

Conceptually, telecommunication network coverage is a fundamental concept in the telecommunications industry, serving as a critical determinant of service accessibility, quality, and ultimately, customer satisfaction. Network coverage refers to the extent and reliability of a telecommunication operator's network, indicating the areas in which users can successfully access voice, data, and other services (Nyongesa Sande, 2025).

Network coverage plays a central role in shaping customer satisfaction and service experience within the telecommunications industry. In developing markets, including Sub-Saharan Africa, access to reliable network infrastructure is closely linked to users' ability to communicate, access digital services, and participate in economic activities (UNCTAD, 2013). The importance of network coverage has increased with the evolution from 2G to high-speed broadband and fibre optic networks, which enable new forms of digital interaction and service delivery (Gruber & Koutroumpis, 2011). Therefore, examining network coverage requires attention to **technological, geographical,** and **service-based** dimensions, each of which has been shown to affect user experience and satisfaction differently (Bahia et al., 2020).

In CAMTEL Kumba, network coverage remains inconsistent and uneven, while some areas do not receive that network at all, in some, signal strength is weak, broadband access is limited, and network outages are frequent, sometime customers whole spend money on subscription end up not using it because of the absent of network. It should be noted that service-based coverage, including voice, data, and broadband, is sometimes unreliable, resulting in dropped calls, slow internet connections, and poor quality network. Technological coverage also varies, with 3G and fibre-optic services being more accessible in some areas while others rely largely on 2G networks if available. These deficiencies compromise customer experience, reduce perceived service quality, and limit subscribers' ability to fully utilize Camtel services.

Based on this, the consequences of these gaps in network coverage are significant for CAMTEL customers in Kumba. Poor network performance leads to customer dissatisfaction, frustration, and reduced trust in the service provider. Subscribers may experience disrupted business operations, limited access to mobile banking and online learning, and an inability to stay connected with family and social networks. Ultimately,

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inconsistent network coverage may result in customer churn, as dissatisfied subscribers consider switching to alternative providers such as MTN or Orange, negatively affecting CAMTEL's market share and reputation.
This problem highlights the urgent need to investigate the impact of network coverage taking into consideration technological, geographical, and service-based network coverage on customer satisfaction in CAMTEL Kumba.

2 Literature Review

2.1 Conceptual Review

2.1.1 Network Coverage

Network coverage can be described as the activities, benefits, or satisfactions which are offered to users, and which are intangible in nature (Kotler, 2000). That is, it is not a concrete object which can be seen, felt, or tasted; rather, users enjoy the benefits from it (Plessis & Rousseau, 1999). When a customer uses network coverage from a telecommunications provider, the customer simply benefits from the time, knowledge, and skills of the network provider (Plessis & Rousseau, 1999).

A central component of customer satisfaction in the telecommunications industry is network coverage, which determines the accessibility, reliability, and consistency of service across geographic areas. Network coverage ensures seamless connectivity, providing customers with reliable access to voice, data, and messaging services. Inconsistencies in coverage such as frequent call drops, slow internet speeds, or network unavailability directly affect customer experience, leading to frustration and reduced satisfaction. Reliable and widespread network coverage gives customers a sense of control and confidence in the service provider (Ding & Keh, 2017).

2.1.2 **Concept of Customer Satisfaction**

Despite the widespread recognition attached to customer satisfaction, researchers have not yet agreed on one global definition for it. Although the constructs have been thoroughly explored, one theoretical model has not and likely will not be accepted due to the complex process involved in arriving at a customer's judgment of satisfaction or dissatisfaction. Swan and Combs (1976) defined satisfaction as a post-purchase attitude. Westbrook (1980) introduced the notion that customer satisfaction involves cognitive and affective aspects in pre-purchase, purchase, and post-purchase phases of buying goods and/or receiving services. Rust and Oliver (1994) suggest that customer satisfaction or dissatisfaction emerges as a response to a single or prolonged set of service encounters. Giese and Cote (2000) argue that consumer satisfaction comprises three basic components including the type of response; the centre of interest or the subject on which the response is focused; and the moment in time at which the evaluation is made.

Customer satisfaction with CAMTEL services refers to subscribers' evaluation of how well the company meets their expectations in terms of telecommunication service delivery. It is a measure of how users perceive the quality, reliability, and responsiveness of CAMTEL's offerings, such as mobile network coverage, internet connectivity, customer support, and

value-added services. According to Oliver (1999), satisfaction occurs when customer expectations are met or exceeded, while dissatisfaction arises when expectations fall short.

2.2 Empirical Studies

Relationship between Geographical Network Coverage and Customer Satisfaction

Deepika et al. (2020) conducted a study on the behavioural consequences of perceived service quality in the Indian telecommunications industry. For the purpose of understanding the effect of geographical network coverage on customer satisfaction, the study was adapted to focus on discrepancies between customers' expectations and perceptions of network coverage, as well as the connection between network coverage and customers' satisfaction. Primary data collection was employed, with data gathered from 500 customers across Delhi NCR, India. Paired sample t-tests and multiple correlation analysis were performed to assess the relationship between perceived network coverage and customer satisfaction.

The results of the adapted study indicated that significant gaps exist between customers' expected and perceived network coverage, particularly in areas with poor or inconsistent connectivity. The findings further revealed that customers' perceptions of network coverage strongly influence their overall satisfaction, with better coverage leading to higher satisfaction and loyalty. This demonstrates that geographical network coverage is a key determinant of customer satisfaction in the telecommunications industry.

Mubashir Majid Baba (2018) conducted a study titled "Service Quality and Customer Loyalty: A Study in the Telecom Sector" which explored the intricate relationship between geographical boundaries of network connectivity and customer loyalty within the telecommunications industry. The study was out to assess the effect of geographical boundaries of network connectivity on customer satisfaction. That is, the study was adapted to examine gaps in network coverage across different locations and their influence on customer satisfaction. The study focused on identifying key dimensions of network coverage such as reliability, consistency, accessibility, responsiveness, and signal strength that significantly affect customer satisfaction in a given geopolitical boundary.

The research employed a questionnaire survey using simple random sampling, collecting primary data from telecom users. The findings indicated that there exists a significant gap between customers' expectations of network coverage and their actual experiences, particularly in rural and semi-urban areas. The study also revealed that perceived network coverage has a strong impact on customer satisfaction, with better coverage leading to higher levels of satisfaction, positive behavioural intentions, and loyalty toward telecom operators. These findings underscore the critical role of geographical network coverage in shaping overall customer satisfaction in the telecom sector.

Relationship between Technological Network Coverage and Customer Satisfaction

Abd Elrahman Hassanein (2018), in their study, "A Review of Telecommunications Network Service Connectivity", examined the service quality dimensions established in various empirical studies conducted worldwide, specifically in the telecommunications industry. For understanding the impact of technological network coverage on customer

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satisfaction, the study was adapted to focus on dimensions of service quality related to network technology and connectivity. This review included empirical studies based on survey data and statistical analysis conducted between 2001 and 2017.

The study supports the view that the importance and dimensionality of service quality vary across cultural and country contexts, even within the telecom sector. It identifies eight critical service quality dimensions in telecommunications services: reliability, tangibles, responsiveness, assurance, empathy, network, customer service, and convenience. Among these, technological network coverage including network reliability, accessibility, and speed was found to have a significant impact on customer satisfaction. Customers' perceptions of the adequacy and consistency of network technology directly influence their satisfaction levels, highlighting the pivotal role of technological coverage in maintaining positive customer experiences in the telecommunications sector.

The Relationship between service Based Network Coverage and Customer Satisfaction

Meena Suganthi G. et al. (2017), carried out a study on "Customer Perception towards Service Quality network in Indian Telecommunications Industry", examined the factors shaping customers' perceptions of service quality in the telecom sector. The purpose of the study was to examine the impact of service-based network coverage on customer satisfaction. That is the study was focus on network quality as a key determinant of customer perceptions. The study was conducted in Sathyamangalam, Tamil Nadu, using a structured questionnaire developed from previous research. Data was collected from 100 customers, and a customer perception model was developed including variables such as network quality, perceived quality, market factors, perceived value, and company image. The study found that network-related service quality significantly influences customers' overall satisfaction, highlighting that consistent and reliable coverage is central to positive customer perceptions.

Dubey and Srinivastava et al. (2016), in their study "Impact of Service Quality on Customer Loyalty: A Study on Telecom Sector in India", explored how service quality affects customer loyalty and relationship management in the telecom industry. The purpose of the study was to evaluate the impact of service-based network coverage on customer satisfaction. Data was collected from 262 mobile service users across various telecom operators in India through an online structured questionnaire. Exploratory factor analysis validated the constructs, while Cronbach's alpha confirmed reliability. The results revealed that service-based network coverage has a significant positive effect on customer satisfaction, which in turn strengthens customer loyalty and enhances the overall relationship between the customer and the telecom provider.

Despite extensive research on the relationship between network coverage and customer satisfaction, several gaps remain, particularly in the context of Cameroon. Most empirical studies, such as those conducted in India (Deepika Jhamb et al., 2020; Dubey & Srinivastava, 2016), focus on international contexts, with limited attention to the Cameroonian telecommunications environment. Given that infrastructural, technological, and socio-economic conditions vary significantly across countries, findings from other regions may not fully capture the experiences and expectations of CAMTEL customers in Kumba. This

highlights the need for context-specific research to understand how local factors influence customer satisfaction with network services.

Another gap in the literature is the tendency to study overall service quality rather than isolating network coverage as a distinct determinant of customer satisfaction. While frameworks like SERVQUAL measure general service quality, they often merge dimensions such as reliability, responsiveness, and tangibles, without focusing specifically on the availability, accessibility, and reliability of network coverage. This makes it difficult to determine the direct influence of network performance on customer satisfaction, particularly in areas where connectivity challenges persist.

Furthermore, existing studies often examine technological coverage (e.g., signal strength, speed, reliability) and geographical coverage (e.g., network availability across regions) separately (Abd Elrahman Hassanein, 2018; Mubashir Majid Baba, 2018). Few studies explore how these two dimensions interact to influence customer perceptions and satisfaction, especially in rural or semi-urban areas where network gaps are more pronounced. Understanding this interaction is essential for service providers seeking to improve both coverage reach and technological quality simultaneously.

The integration of multiple theoretical perspectives in explaining customer satisfaction is also limited. The Technology Acceptance Model (TAM), Expectation Confirmation Theory (ECT), and SERVQUAL have individually explained aspects of technology adoption, expectation confirmation, and service quality. However, few studies combine these frameworks to offer a comprehensive understanding of how cognitive perceptions, experiential factors, and service-quality dimensions collectively shape customer satisfaction in the telecommunications sector.

Finally, much of the current literature predates the rapid expansion of advanced mobile networks, such as 4G and 5G, and does not adequately account for how these technological improvements influence customer satisfaction and loyalty. Moreover, research has predominantly focused on immediate satisfaction outcomes, with limited exploration of downstream effects such as customer loyalty, intention to recommend, and continued service usage. This leaves a gap in understanding the long-term implications of network quality improvements for customer retention and business performance in the Cameroonian context.

3 Research Methodology

3.1 Research Design, Population of Study and Sampling Technique

This study adopted a quantitative research approach with a causal research design. The population of study comprised CAMTEL client in Kumba who utilize mobile, internet, and other telecommunication services. Statistic from CAMTEL Kumba service Centre shows and estimated 10000 mobile subscribers and 750 optical fibre subscribes

CAMTEL Kumba serves as a primary telecommunications provider in the city, offering services to a diverse customer base that includes residential users, businesses, and institutions. The target population included active CAMTEL subscribers within the Kumba municipality distributed as follows:

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Table 1: Spread of Target Population

S/N	Target Population	Total
1	**Mobile Subscriber**	10 000
2	**Fixed Subscribers**	750
	Grand Total	**10 750**

Source (CAMTEL Service Centre Kumba)

While the target population includes active CAMTEL subscribers in Kumba, practical considerations such as consent, availability, and willingness to participate reduce the number of respondents that can actually be contacted.

3.2 Sample Size and Sampling Technique

400 active CAMTEL subscribers in Kumba, including **300 mobile subscribers** and **100 fixed-line subscribers were selected by convenience following Yamane's (1967) formula**, with a conventional margin of error of 5% (e=0.05e = 0.05e=0.05), which corresponds to a 95% confidence level. The formula is expressed as: Yamane formula $n = N / (1 + N(e^2))$, Where: n = sample size, N = population size, e = margin of error

Table 2: Spread of Sample Size

Subscriber Type	Accessible Population	Sample Size
Mobile	300	150
Fixed	100	50
Total	400	200

3.3 Instrument for Data Collection and Analysis

Questionnaires were used to collect data. The procedure for data collection in this study was carefully designed to ensure the gathering of accurate, reliable, and relevant information while adhering to ethical standards. Prior to data collection, formal permission was obtained from CAMTEL Kumba management to conduct the study, ensuring compliance with organizational policies and facilitating access to subscribers. The instrument was developed to capture respondents' perceptions of geographical network coverage, technological network coverage, service-based network coverage, and overall customer satisfaction. The questionnaire was pre-tested with a small group of CAMTEL customers outside the main sample to assess clarity, relevance, and comprehension of the items, and necessary adjustments were made based on the feedback received. Once finalized, the questionnaires were administered directly to respondents, with the researcher providing clear explanations of the study's purpose, instructions for completing the items, and emphasizing the importance of honest and accurate responses. For subscribers who were

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unavailable during the initial administration, questionnaires were left for later completion and systematically collected afterward to ensure completeness. Throughout the process, participants were assured of the confidentiality and anonymity of their responses, and it was emphasized that participation was voluntary, with the option to withdraw at any time. This structured and carefully monitored approach ensured that the data collected was credible, complete, and relevant to achieving the objectives of the study.

The data collected in this study were systematically analysed to ensure accurate interpretation and meaningful conclusions regarding the impact of network coverage on customer satisfaction at CAMTEL Kumba. Before analysis, all completed questionnaires were reviewed for completeness and consistency, and any errors or omissions were addressed during the data cleaning process. Each questionnaire was coded, and responses were entered into SPSS (Statistical Package for Social Sciences) to facilitate organized and precise analysis. Descriptive statistics were first employed to summarize respondents' demographic characteristics and key study variables. Frequencies and percentages were used for categorical variables such as gender, age, and type of subscription, while measures of central tendency and dispersion, including means and standard deviations, were calculated for continuous variables such as perceptions of geographical, technological, and service-based network coverage and overall customer satisfaction.

To examine the relationships between network coverage dimensions and customer satisfaction, inferential statistical techniques were applied. Pearson's correlation coefficient was used to determine the strength and direction of the relationships between geographical network coverage, technological network coverage, service-based network coverage, and customer satisfaction. Multiple regression analysis was further conducted to assess the predictive effect of each dimension of network coverage on customer satisfaction, identifying which aspects of network coverage significantly influenced customer perceptions while controlling for other variables. Hypothesis testing was performed at a 0.05 significance level ($p < 0.05$) to determine the statistical significance of the results. This combined approach of descriptive and inferential statistics ensured a comprehensive understanding of the data, allowing the study to draw statistically robust, reliable, and meaningful conclusions regarding the effect of network coverage on customer satisfaction.

The relationship between network coverage and customer satisfaction was modelled using multiple regression. The dependent variable is Customer Satisfaction (CS), while the independent variables are Geographical Network Coverage (GNC), Technological Network Coverage (TNC), and Service-Based Network Coverage (SNC). The functional form of the model can be expressed as:

$CS=f\ (GNC, TNC, SNC)$

This can be further expressed in linear regression form as:

$CS=\beta_0+\beta_1 GNC+\beta_2 TNC+\beta_3 SNC+\epsilon$

Where:

CS = Customer Satisfaction

$\beta 0$ = Constant

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β_1, β_2, β_3 = Coefficients of the network coverage variables

GNC = Geographical Network Coverage

TNC = Technological Network Coverage

SNC = Service-Based Network Coverage

ϵ = Error term

This model allows the researcher to test hypotheses regarding the effect of each dimension of network coverage on customer satisfaction while controlling for the influence of the other dimensions, thereby identifying which aspects of network coverage have the most significant impact on customer perceptions and loyalty.

4 Results and Discussions

The presentation that follows is the research findings in relation to the research questions and objectives.

4.1 The Relationship between Technological Network Coverage and Customer Satisfaction

The findings of this study reveal a strong and statistically significant relationship between technological network coverage (2G, 3G, 4G, and fibre-optic) and customer satisfaction among CAMTEL users in Kumba Municipality. The descriptive results indicate that respondents generally hold unfavourable perceptions of CAMTEL's technological network coverage, as reflected in the low mean scores for both technological coverage (M = 1.57) and customer satisfaction (M = 1.79). These values, falling below the midpoint of the measurement scale, suggest that most respondents disagreed with positive statements regarding network performance and service satisfaction. The relatively small standard deviations further indicate that these perceptions are fairly consistent across respondents, implying that dissatisfaction is widespread rather than limited to a small group of users.

The distribution of responses further reinforces this observation. A large majority of respondents (94.4%) expressed disagreement or strong disagreement with statements relating to the adequacy of CAMTEL's technological network coverage, while only a small proportion (5.6%) expressed agreement. Dissatisfaction was particularly pronounced in relation to advanced network services such as 4G speed, reliability, and overall coverage, where up to 96.5% of respondents reported negative perceptions. Even for basic services such as 2G voice communication, satisfaction levels remained relatively low. These results suggest that deficiencies in technological infrastructure especially in terms of speed, stability, and accessibility. However, the presence of a small proportion of positive responses indicates that in certain localized areas where fibre-optic infrastructure or better network conditions exist, users experience relatively improved service quality, which translates into higher satisfaction.

The inferential statistical analysis provides further evidence of the relationship between technological network coverage and customer satisfaction. The Pearson Product Moment Correlation analysis revealed a strong negative correlation ($r = -0.892$, $p < 0.001$), indicating that improvements in perceived technological network coverage are associated with a corresponding decrease in dissatisfaction (or increase in satisfaction, depending on scale

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orientation). The strength of this correlation suggests that technological network coverage is a major determinant of customer satisfaction among CAMTEL users in Kumba. Additionally, the regression analysis shows that technological network coverage accounts for approximately 79.6% of the variation in customer satisfaction ($R^2 = 0.796$), highlighting its substantial explanatory power. The regression model was also statistically significant ($F = 1232.45$, $p < 0.001$), confirming that the observed relationship is not due to random variation but reflects a meaningful association between the variables.

The regression coefficient ($B = -0.924$) further indicates that changes in perceptions of technological network coverage have a strong impact on customer satisfaction. Specifically, variations in network coverage are associated with significant changes in satisfaction levels, emphasizing the critical role that technological infrastructure plays in shaping user experiences. The negative sign of the coefficient reflects the coding of the variables, but substantively, the findings point to the fact that poor technological performance is strongly associated with low customer satisfaction. Overall, these results suggest that CAMTEL's technological network limitations—particularly in advanced services such as 4G and fibre-optic—significantly undermine customer satisfaction in Kumba Municipality.

These findings are consistent with the empirical work of Abd Elrahman Hassanein (2018), who emphasized that technological network coverage is a core dimension of service quality in the telecommunications industry. Hassanein identified network reliability, accessibility, and speed as key factors that influence customer satisfaction across different contexts. The present study supports this view by demonstrating that inadequate technological coverage leads to dissatisfaction among users, particularly when network services fail to meet expectations in terms of consistency and performance. However, while Hassanein's review generally highlights the positive role of effective technological infrastructure in enhancing satisfaction, the findings of this study reflect a situation where technological coverage is perceived as inadequate, thereby producing a strong negative relationship with customer satisfaction. This suggests that the impact of technological network coverage is context-dependent and varies according to the level of infrastructure development and service delivery efficiency in a given setting.

The findings can also be interpreted within the basis of the Technology Acceptance Model (TAM) proposed by Fred Davis (1989, 1993). According to TAM, users' acceptance and satisfaction with a technology are largely influenced by their perceptions of its usefulness and ease of use. In the perspective of this study, technological network coverage directly affects these perceptions. When network services such as 4G and fibre-optic are reliable, fast, and widely accessible, users are more likely to perceive them as useful for communication and data transmission, and easier to use without frequent disruptions. Conversely, poor network coverage characterized by slow speeds, unstable connections, and limited accessibility reduces perceived usefulness and ease of use, leading to lower acceptance and satisfaction levels. The strong negative relationship observed in this study aligns with TAM's proposition that unfavourable user perceptions of technology result in reduced satisfaction and continued dissatisfaction with the service.

In effect, the findings demonstrate that technological network coverage plays a significant and dominant role in determining customer satisfaction among CAMTEL users in Kumba

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Municipality. The evidence from both descriptive and inferential analyses indicates that poor technological infrastructure is strongly associated with low levels of satisfaction.

4.2 The Relationship between Geographical Network Coverage and Customer Satisfaction

The findings of this study indicate that geographical network coverage has a significant relationship with customer satisfaction among CAMTEL subscribers in Kumba Municipality. The descriptive statistics reveal that respondents generally hold unfavourable perceptions of CAMTEL's geographical coverage, as reflected in the low mean score for geographical network coverage (M = 1.89) and customer satisfaction (M = 1.79). Both values fall below the midpoint of the scale, suggesting that respondents largely disagreed with positive statements regarding the extent and effectiveness of network coverage across urban, suburban, and rural areas. The moderate standard deviations further indicate that while there is some variation in responses, the overall perception leans toward dissatisfaction.

The distribution of responses further strengthens this observation. A substantial majority of responses (80.0%) fell within the disagree and strongly disagree categories, indicating widespread dissatisfaction with CAMTEL's geographical network coverage. The dissatisfaction is particularly pronounced in suburban and rural areas, where 88.0% and 94.5% of respondents respectively reported inadequate coverage. This suggests that CAMTEL's network is perceived to be concentrated more in urban areas, with significant gaps in less developed or peripheral locations. Additionally, the item assessing coverage across mobility (travelling within Kumba) produced mixed responses, indicating that while some users experience acceptable continuity of service, others encounter interruptions depending on their location. This variation reflects inconsistencies in network distribution and highlights the uneven nature of coverage across the municipality.

The inferential statistical results confirm the existence of a significant relationship between geographical network coverage and customer satisfaction. The Pearson correlation coefficient ($r = -0.784$, $p < 0.001$) indicates a strong negative relationship between the two variables. This implies that poorer geographical coverage is associated with lower levels of customer satisfaction. The regression analysis further demonstrates that geographical network coverage explains approximately 61.5% of the variation in customer satisfaction ($R^2 = 0.615$), indicating that it is a major predictor of how customers evaluate CAMTEL's services. The model is statistically significant ($F = 343.80$, $p < 0.001$), confirming that the observed relationship is not due to chance.

The regression coefficient ($B = -0.86$) suggests that changes in perceived geographical coverage have a substantial effect on customer satisfaction. Although the negative sign reflects the coding of the variables, the substantive interpretation is that improvements in geographical coverage are associated with higher levels of customer satisfaction. Conversely, gaps in coverage, particularly in suburban and rural areas, lead to dissatisfaction due to limited accessibility, weak signals, and inconsistent service availability. These findings highlight the importance of uniform network distribution in ensuring that customers across all locations experience reliable and consistent service.

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The results of this study are consistent with the empirical findings of Deepika Jhamb, Amit Mittal, and Pankaj Sharma (2020), who examined perceived service quality in the telecommunications industry. Their study revealed significant gaps between customers' expectations and actual experiences of network coverage, particularly in areas with poor or inconsistent connectivity. Similarly, the present study demonstrates that customers in Kumba perceive notable deficiencies in CAMTEL's geographical coverage, especially outside urban centres. Both studies emphasize that customers' perceptions of network reach and consistency play a critical role in determining satisfaction levels, with better coverage leading to improved satisfaction and loyalty.

In the same vein, the findings align with the work of Mubashir Majid Baba (2018), who established that geographical boundaries of network connectivity significantly influence customer satisfaction in the telecom sector. Baba's study identified that inadequate coverage in rural and semi-urban areas creates gaps between customer expectations and actual service delivery, resulting in dissatisfaction. The present study corroborates this by showing that CAMTEL users in suburban and rural areas report higher levels of dissatisfaction compared to those in urban areas. This reinforces the notion that geographical disparities in network availability are a key determinant of customer satisfaction and user experience in telecommunications services.

The findings can also be interpreted using the **Expectation Confirmation Theory (ECT)** proposed by Richard L. Oliver (1980). According to ECT, customer satisfaction is determined by the extent to which perceived service performance meets or exceeds prior expectations. When customers experience network coverage that falls short of their expectations particularly in terms of accessibility across different locations they are likely to experience dissatisfaction. In this study, the widespread perception of inadequate geographical coverage, especially in suburban and rural areas, indicates a negative disconfirmation of expectations. Customers likely expect consistent network availability across all parts of Kumba, but the observed gaps in coverage result in unmet expectations, thereby reducing satisfaction levels.

Similarly, the findings are consistent with the **SERVQUAL model** developed by A. Parasuraman, Valarie A. Zeithaml, and Leonard L. Berry, which conceptualizes service quality as the gap between customer expectations and perceived service performance across dimensions such as reliability, responsiveness, and accessibility. Geographical network coverage in this context can be associated with the reliability and accessibility dimensions of SERVQUAL. The study findings suggest that CAMTEL's perceived failure to provide consistent and accessible network coverage across all geographic areas creates a service quality gap, which in turn leads to customer dissatisfaction. Customers expect reliable connectivity regardless of their location, but inconsistencies in coverage, particularly outside urban centres, contribute to negative evaluations of service quality.

In effect, the findings demonstrate that geographical network coverage has a significant and negative relationship with customer satisfaction among CAMTEL users in Kumba Municipality. The evidence indicates that inadequate coverage in suburban and rural areas is a major contributor to dissatisfaction, while more consistent coverage in certain urban locations yields comparatively better user experiences. These results are consistent with

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empirical literature and theoretical frameworks such as Expectation Confirmation Theory and the SERVQUAL model, both of which emphasize the importance of meeting customer expectations through reliable and accessible service delivery.

4.3 The Relationship between service Based Network Coverage and Customer Satisfaction

The findings of this study reveal that service-based network coverage (voice, data, and broadband services) has a strong and statistically significant positive relationship with customer satisfaction in CAMTEL Kumba ($r = 0.684$, $p < 0.01$). This implies that improvements in service delivery, particularly clearer voice calls, stable data connectivity, and expanded broadband access, are important drivers of how customers evaluate their overall experience. The regression results further reinforce this relationship, showing that service-based network coverage explains 46.8% of the variation in customer satisfaction, with a significant positive effect ($B = 0.55$, $p < 0.001$).

These results align well with service quality theory, particularly the SERVQUAL model, which posits that customer satisfaction is largely determined by perceived service performance across dimensions such as reliability, responsiveness, and assurance. In this study, voice clarity and network improvements reflect the **reliability dimension**, which appears to be relatively strong. Customers acknowledging improved network coverage (67.5%) indicates that CAMTEL's recent infrastructure efforts are positively influencing perceived service quality.

However, the findings also reveal a paradox, despite the strong positive relationship between service-based coverage and satisfaction, overall customer satisfaction remains low (mean = 1.79), and behavioural outcomes such as loyalty and recommendation are weak. This suggests that service quality alone is not sufficient to guarantee satisfaction, which is consistent with Expectation-Confirmation Theory (ECT). According to ECT, satisfaction depends not only on perceived performance but also on whether that performance meets or exceeds customer expectations. In this case, although network performance has improved, customers may still feel that the service does not justify the cost, as evidenced by the high proportion (85%) who perceive poor value for money.

The findings are strongly supported by the study of Meena Suganthi G. et al. (2017), which established that network-related service quality is a critical determinant of customer satisfaction in the telecom sector. Similar to the CAMTEL situation, their study emphasized that consistent and reliable network coverage enhances customer perception and satisfaction. The agreement between the two studies reinforces the idea that network performance remains a foundational element of telecom service evaluation across different geographical contexts.

Likewise, the results are consistent with the work of Dubey and Srinivastava (2016), who found that service-based network coverage significantly influences customer satisfaction and, indirectly, customer loyalty. However, while their study demonstrated a clear pathway from service quality to loyalty, the present study reveals a disconnect between satisfaction drivers and loyalty outcomes. This divergence may be attributed to contextual differences, particularly pricing concerns, competitive pressures, or customer expectations in Kumba, which appear to weaken the satisfaction–loyalty link.

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5 Conclusions, Implications of the study, Contributions to science, Recommendations and suggestions for further studies

5.1 Conclusions

This study set out to examine the relationship between network coverage dimensions, technological, geographical, and service-based and customer satisfaction among CAMTEL subscribers in Kumba Municipality. The findings provide clear evidence that all three dimensions of network coverage play **a significant role in shaping customer satisfaction,** although their effects vary in direction and magnitude.

Firstly, the study established that **technological network coverage** has a strong and significant relationship with customer satisfaction. However, the relationship is negative due to poor perceptions of CAMTEL's technological infrastructure, particularly in advanced services such as 4G and fibre-optic connectivity. The results indicate that deficiencies in speed, reliability, and accessibility significantly undermine customer satisfaction. This confirms that technological infrastructure is a **critical foundation for service delivery**, and when it is inadequate, it leads to widespread dissatisfaction.

Secondly, the findings revealed that **geographical network coverage** also has a significant relationship with customer satisfaction. The results highlight substantial disparities in network availability across different areas of Kumba, with rural and suburban regions experiencing the greatest challenges. The uneven distribution of network services limits accessibility and continuity, thereby reducing satisfaction. This suggests that **coverage equity across locations is essential** for ensuring a consistent and satisfactory customer experience.

Thirdly, the study found that **service-based network coverage** has a strong and significant positive relationship with customer satisfaction. Improvements in voice clarity, data services, and broadband access were positively recognized by customers and contributed to better service evaluations. However, despite this positive relationship, overall customer satisfaction remains low, largely due to concerns about pricing, perceived value, and weak customer loyalty. This indicates that while service improvements are necessary, they are **not sufficient on their own to guarantee satisfaction and retention.**

Taken together, the findings demonstrate that customer satisfaction in the telecommunications sector is **multidimensional,** influenced not only by technical performance and service delivery but also by customer expectations, perceived value, and overall service experience. The study confirms that improvements in network coverage, whether technological, geographical, or service-based are essential, but must be complemented by strategies that address pricing, customer engagement, and value perception.

In conclusion, CAMTEL's efforts to improve service-based network performance are yielding positive outcomes; however, significant gaps remain in technological infrastructure and geographical coverage. To enhance customer satisfaction and foster loyalty, CAMTEL must adopt a **holistic approach** that integrates infrastructure development, equitable network distribution, competitive pricing, and improved customer relationship management. Only by addressing these interconnected factors can the

company achieve sustainable improvements in customer satisfaction and long-term competitiveness in Kumba Municipality.

5.2 Implications of the study

The implications of this study to entrepreneurship is enormous if results are implemented. It will contribute of great deal in enhancing various businesses including banks' activities as well as online businesses. It will also increase the speed of activities.

5.3 Contributions to science

The methodology used enables to capture the effects of network coverage on customers' satisfaction.

5.4 Recommendations

Based on the findings of this study, the following recommendations were proposed in line with the specific objectives:

CAMTEL should prioritize significant upgrades to its technological infrastructure, particularly in the areas of 4G and fibre-optic services. The results showed widespread dissatisfaction with network speed, reliability, and accessibility, which strongly undermines customer satisfaction. Therefore, improving network stability, reducing call drops, and enhancing data transmission speeds should be a central focus. Continuous monitoring systems should also be implemented to quickly identify and resolve technical faults. By strengthening its technological backbone, CAMTEL can improve users' perceptions of usefulness and ease of use, thereby enhancing overall satisfaction.

With respect to geographical network coverage, the study revealed substantial disparities in service availability, especially in rural and suburban areas of Kumba Municipality. To address this, CAMTEL should expand its network infrastructure by increasing the number of base stations and transmission towers in underserved areas. Ensuring a more uniform distribution of network services across all locations will help reduce inequalities in access and improve customer experience. Additionally, efforts should be made to enhance network continuity for users on the move, minimizing service interruptions across different parts of the municipality. Such improvements will help meet customer expectations for reliable and accessible connectivity regardless of location.

Regarding service-based network coverage, although the study found a significant positive relationship with customer satisfaction, overall satisfaction levels and customer loyalty remain low due to poor perceptions of value for money. Therefore, CAMTEL should review its pricing strategies to ensure that the cost of services reflects the quality delivered. Introducing more flexible and affordable service packages could improve perceived value. At the same time, the company should enhance customer service delivery by responding more effectively to complaints and maintaining clear communication about ongoing network improvements. Strengthening customer engagement and introducing loyalty programs will also be essential in converting improved service performance into sustained customer satisfaction, retention, and positive recommendations.

Suggestions for Further Study

In light of the findings and limitations of this study, several areas are recommended for further research to deepen understanding of network coverage and customer satisfaction in the telecommunications sector.

Future studies should consider expanding the geographical scope beyond Kumba Municipality to include other regions of Cameroon. A comparative study across urban, semi-urban, and rural areas would provide a broader perspective on how network coverage affects customer satisfaction in different contexts and enhance the generalizability of the findings.

Additionally, further research could incorporate a larger sample size to capture more diverse customer experiences and improve the reliability of results. Including respondents from different demographic and socio-economic backgrounds would also help in understanding how customer characteristics influence perceptions of network quality and satisfaction.

There is also a need for studies that adopt a **mixed-methods approach,** combining quantitative surveys with qualitative methods such as interviews or focus group discussions. This would provide deeper insights into the reasons behind customer dissatisfaction, particularly regarding value for money, loyalty, and willingness to recommend services.

Future research should also examine additional variables that were not fully explored in this study, such as pricing strategies, customer service quality, brand image, and competitive dynamics within the telecommunications industry. Including these factors would provide a more comprehensive understanding of the determinants of customer satisfaction and loyalty.

Moreover, longitudinal studies are recommended to track changes in customer satisfaction over time, especially as telecommunications companies continue to invest in infrastructure and improve service delivery. This would help to assess whether improvements in network coverage lead to sustained increases in customer satisfaction and retention.

Finally, further studies could explore the relationship between customer satisfaction and behavioural outcomes such as customer loyalty, retention, and switching behaviour in greater depth. This would help to better understand why improvements in service-based network coverage do not always translate into increased customer commitment, as observed in this study.

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