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REVIEW ARTICLE

Post-Installation Smart Meter and Billing Service Quality Assessments

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Abstract

Background/Objectives: The Electricity Company of Ghana (ECG) introduced meters since its establishment. Although meters have undergone several technologically innovative phases, customers face challenges. The study examines the relationship between perceived quality and customer satisfaction concerning these meters. It also investigates the mediating role of meter brands between perceived quality and customer satisfaction. **Methods**: Four hundred and seventy (470) questionnaires were distributed to ECG Customers. Three hundred twenty-four (324) questionnaires were returned for analysis. The data were analyzed using Partial Least Squares Structural Equation Modeling. **Findings**: The results demonstrate a highly significant positive relationship (β = 0.701; p = 0.000) between Perceived Quality and Customer Satisfaction. In addition, the mediator, the meter brand, shows a positive and significant relationship between perceived quality and customer satisfaction (β = -0.150; p = 0.038). However, no significant relationship between meter brand and customer satisfaction was found (β = 050; p = 0.261). **Novelty**: This finding emphasizes the significance of a smart meter's perceived quality in predicting customer satisfaction, which shows that the service provider is perceived to be credible and reliable among customers. The finding can assist ECG in improving their managerial and operational strategies and policies, thereby increasing profit. The findings also underscore that customers do not view brands as determinants of the perceived quality of the meters; hence, they should focus more on the issuance or installation quality of the meters.

Keywords: Perceived Quality; Customer Satisfaction; Smart Meter; Meter Brand And Challenges 1

1 Introduction

In September 2022, the Electricity Company of Ghana informed its valued customers of a technical issue that impacted their prepaid metering systems, halting electricity credit sales. Inadequate distribution systems, large transmission and distribution losses, revenue loss from nonpayment of bills, and an inefficient tariff structure are all

identified as major obstacles[1]. Non-technical losses (NTL) due to faulty meters, power thefts, inaccurate meter reading estimation, flat-rate consumers, customers tampering with meters, and illegal connections are becoming increasingly prevalent in today's power grid, and the traditional postpaid metering device is inadequately equipped for managing it. Today, smart meters can be monitored remotely via wireless connections. In contrast to the post-paid meter, which results in nonpayment of electricity consumed by customers. A recent report on April 2023 on Ghanaweb, indicates a massive disconnection exercise associated with post-paid meters which were targeted at residential users, enterprises, ministries, departments, and state institutions in an attempt to recuperate millions from these entities. To combat the growth-inhibiting phenomenon of power theft, ECG had to appeal to the public for information to identify entities involved in such activity. Meanwhile, criminal prosecution of everyone involved in such an illicit connection had commenced. Addressing issues with the post-paid metering system prompted the emergence of electricity pre-paid metering. Fortunately, issues like this are not present with the prepaid metering system. However, most citizens believe that ECG would gain more from the switch to prepaid electricity meters from the post-paid metering system. Prepaid metering's advantages. The ability to quickly deposit payments into the account of the utility provider ECG is one of the main advantages of the prepaid metering system. In contrast, post-paid meters were plagued with a lack of revenue. The general quality of electricity supplied to consumers is also significantly enhanced. The use of anticipated billing, which frequently leads to overcharging and issues with consumers, is eliminated with prepaid meters. Customers who use prepaid meters pay exclusively for the power they genuinely use. Prepaid electricity meters are an effective and efficient means of monitoring energy consumption. This meter tracks electrical use and transmits it periodically to the utility company for monitoring and billing. They assist utilities to save money and time by obtaining real-time data on electricity use and tracking patterns of consumption.

1.1 Research Gap

According to a previous study[2], the upsurge in the installation of smart meters for both domestic and industrial use has come with challenges. These challenges include electricity theft, intermittent metering device failure, difficulty uploading units, and so on; however, there has been a lack of research into these issues. According to[3], smart meters have opened up new avenues of exploitation in the electricity distribution sector. However, overcoming these challenges does not only require technical considerations but also depends on a variety of consumer behaviour factors that determine consumers' inclination to engage more actively and make full use of these intelligent meters. Earlier studies were more inclined toward the investigation of privacy and security concerns; meanwhile, this study addresses these gaps identified above; hence, it will investigate (a) how smart meter perceived quality influences customer satisfaction with service quality and (b) the mediating role of meter brands between perceived quality and customer satisfaction.

1.2 Problem Statement

The Ghana news agency reported in 2022 that pre-paid ECG users had trouble buying electricity from a third-party vendor. A related statement by the Public Utilities Regulatory Commission (PURC) has also noted the difficulties ECG customers are having with vending machines expressing their concern about the situation. Previous research by[4], smart meter design introduces security and privacy concerns that can only be fully addressed by redesigning smart meters. These issues raised a quality concern from the perspective of users of these intelligent meters. On December 21, 2020, the Institute for Energy Security (IES) issued a directive to ECG urging the company to address the various issues that are faced by its pre-paid customers since a client's indebtedness to ECG increases in proportion to the quantity of consumed power purchased. In addition to this, Prepaid customers are receiving astronomical bills for energy that was not used. Field technicians often have to spend hours or even days resetting clients' electricity meters to restore power to their homes and businesses. On October 2, 2022, ECG released a statement alerting consumers using both new and old prepaid meters of potential disruptions to their ability to purchase electricity credits. Information about electricity purchases made with prepaid credits is kept in a central database and uploaded only when the meter is in range of the server. If the meters are unable to communicate with the server for the duration of a normal reconciliation, the meters will immediately convert to credit mode, allowing customers to use electricity above their credit amount. While several studies[2,3], have been conducted in other geographical areas to assist Smart meter service providers in improving their service delivery, none have been conducted in Ghana. The researchers want to conduct a survey and analyze the data using the structural equation model (SEM) technique to reveal the relationship between perceived meter quality and customer satisfaction in line with meter billing service quality. The researchers selected SEM for two reasons: (a) it has the advantage of identifying directionality in the influence of activity from one variable to another, and (b) it allows the researcher to test the validity of a theoretical model based on the proposed concept under investigation.

1.3 Motivation

The study will assist service providers in measuring and enhancing consumer satisfaction with smart meter installations in order to improve their reputation and overall service quality. As a result, service providers will be guided in providing better experiences in addressing client problems. Evaluating the link between perceived quality and customer satisfaction can aid in the improvement of possible smart meter technological difficulties, leading to the creation of more reliable, accurate, and user-friendly smart meter solutions. Researchers may discover the precise characteristics of smart meters that are essential to customers and inform the creation of customer-centric initiatives, such as enhancing dependability and functionality, by examining the perceived quality of smart meters and their impact on customer satisfaction.

The general objective of this study is to investigate Customer Perceived Quality and determine if meter brand options are a source of customer dissatisfaction. Hence, the specific objective is to:

1) Examine the relationship between Perceived Quality and customer satisfaction
2) Assess the effect of the meter brand on customer satisfaction.
3) Assess the mediating role of the meter brand between Perceived Quality and customer satisfaction.

2 Methodology

2.1 Proposed Framework

The quality of service is quantified by how much it deviates from the consumer's unfounded expectations. Service quality and consumer satisfaction using intelligent brand meters are examined. By establishing the relationship between service quality perception and customer satisfaction. Reliability, tangibility, empathy, responsiveness, security, stability, and assurance are employed to measure perceived quality to establish whether customers are satisfied with meter services. The current study proposes seven (7) dimensions for measuring perceived quality from a literature perspective as shown in Table 1 below. Figure 1 illustrates the proposed conceptual framework for measuring customer perception.

Table 1. Constructs and Adapted from Prior Research Efforts

Dimensions	Constructs	Descriptions	Sources
Reliability	Perceived Quality	The smart meter's ability to perform the services accurately and dependably	(5,6)
Tangibility		Service is provided by smart meters.	(5,6)
Empathy		Understanding Customer's current and changing business needs by Personnel and vendor points availability.	(5,7)
Responsiveness		Personnel proactively help customers by providing timely service delivery concerning complaints and requests.	(7,8)
Security		Relates to the physical security and the Secure payment process of the smart meters at the Customer's premises	(9)
Stability		Reliability and effective functioning based on services received from these smart meters by the customers	(5,6)
Assurance		Vendors can convey trust and confidence in the Customer towards the service in terms of friendliness, honesty and trustworthiness.	(5,6)
Satisfaction	Customer satisfaction	Customer satisfaction or dissatisfaction stems from evaluating a product's performance given their expectations.	(6,10,11)
Brand Image	Meter brand	The quality of meter design and any other feature that distinguishes it from one manufacturer's product from those of other manufacturers	(12,13)

2.1.1 Perceived Quality

Service quality is influenced by the difference between a customer's expectations, service offering and customer perceptions of the service received; this necessitates customers to answer questions based on their perceptions and expectations, According to[14], customers' perceptions of service quality impact the service process. A study by[15] also revealed that service quality positively affects customer satisfaction and influences brand loyalty. The study by[16]. Also, Investigates the quality of services (QoS) for Optimal Services Selection with dimensions such as execution time, response time, availability, reliability, Throughput, latency, reputation, cost, price and execution time. Reliability, tangibility, empathy, responsiveness, security,

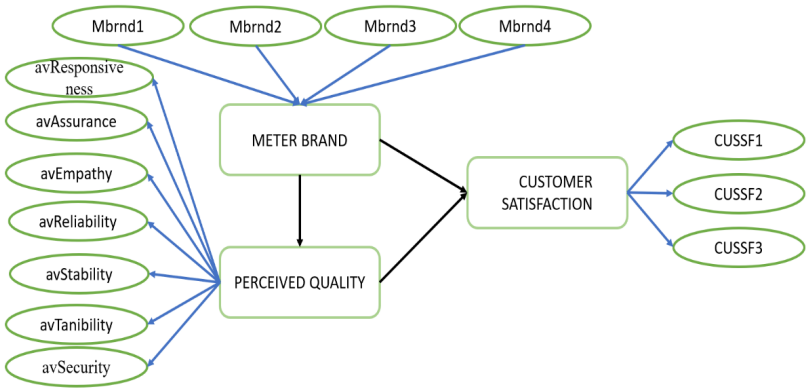

Fig 1. Conceptual framework

stability, and assurance were used as measures of perceived quality in this research.

2.1.2 Meter Brand

The term ”brand” is used to describe how one manufacturer's goods are distinguished from those of other producers. According to [17], companies want to keep their good name in the eyes of their customers by maintaining a reputable brand image. Studies have shown that customer satisfaction may be influenced by product brand and quality [18]. The study by [12] also reveals that service quality positively impacted brand perception. They further indicated that Brand perception influenced customer loyalty, which in turn influenced customer satisfaction. Therefore, this paper evaluates the relationship between perceived quality and customer satisfaction mediated by meter brands.

2.1.3 Customer Satisfaction

Consumers will be unsatisfied if their expectations for a product or service are not realized. Hence the provision of high-quality services can increase client satisfaction. [19]. Validating previous studies' centrality to questions of service quality and customer satisfaction. Customer satisfaction positively correlated with customer loyalty [12]. According to [20]. Customer Perceived Value positively impacts Customer Satisfaction. Hence current study seeks to establish meter brand, perceived quality and customer satisfaction.

2.2 Research Hypotheses

Considering meter brand as the mediating variable, and customer satisfaction as the outcome variable, as proposed in Figure 1. The study concept constitutes three (3) Hypotheses, as shown in Figure 2 . Five service quality dimensions measure the perceived quality. The study hypothesized that perceived quality is related to Customer Satisfaction (H1). Prior research has reported that product quality significantly influences customer satisfaction [18]. Perceived service quality positively influences consumer-brand engagement and brand identification [21]. A relationship exists between customer satisfaction and service quality [22]. Perceived quality affects customer satisfaction [23]. Meter brand as a mediating variable mediating the relationship between perceived quality and customer satisfaction is also considered. Therefore, the study further hypothesized that Meter Brand positively influences customer satisfaction (H2) and mediates between perceived quality and customer satisfaction(H3). Previous studies have shown a relationship between brand experience value and customer satisfaction [20]. There is also a significant linkage between brand image and customer satisfaction [12,17]. Brand experience directly affects customer engagement [24]. The authors, therefore, hypothesize the above framework in Figure 1 based on a literature survey and past research findings. Per Figure 2, as follows:

H1: perceived quality positively directly influences customer satisfaction.

H2: Meter Brand positively influence customer satisfaction.
H3: Meter Brand plays a mediating role in positively influencing customer satisfaction.

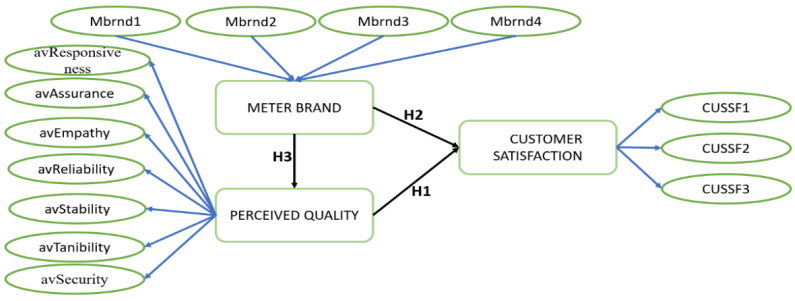

Fig 2. Proposed Conceptual Model

2.3 Empirical Review

2.3.1 Smart Meter

Smart meters, with their innovative anti-tampering design, are a viable alternative in this context, lowering the potential for disputes between service providers and customers. It's a moral arbiter that shifts the calculus of payment and disconnection for a necessity like electricity. Every customer should be concerned with how long it will last and how well it will work. Customers can budget more effectively because of the adaptability of these meters. As the meter is used, the credit balance decreases until it reaches zero, at which point the power is cut off until more credit is purchased.

2.3.2 Billing Challenges

With the introduction of the smart meter, users expect its usage to be devoid of challenges.[(2)] acknowledges these challenges have been persistent in various studies globally. A recent study has also indicated the need to educate clients to eliminate scepticism about intelligent meter usage[(1)]. There's also a widespread belief that installing smart meters will cut down on electricity theft, guarantee sufficient revenue collection, and let operators take swift legal action against offenders.

2.3.3 Geographically Distribution of Meter Brand

An electricity meter is a device that measures the amount of electric energy consumed by a residence, a business, or an electrically powered device. Meters of different accuracy classes are used for other purposes and applications (e.g., Residential, Non-residential, Industrial, etc.). Generally, two broad types of meters are in use Whole Current and Transformer Operated, but for the emphasis of this study, our focus is on the following. Figure 3 below shows various meter brands' issues with customers.

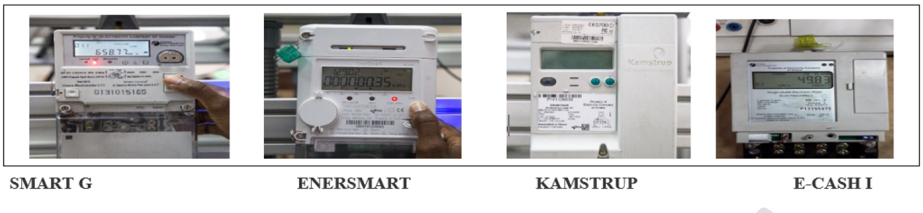

Fig 3. Types of Meter Brands Issued to Customers

Broadly, meters are classified according to the technology used. Currently, in Ghana, deployment of this is based on the Brand, (e-cash 1) meter was geographically distributed in areas such as Cape Coast, Kasoa, Kasoa South, Swedru, Akim Tafo,

Koforidua, Nkawkaw, Ho, Agona, Bibiani, Takoradi, Afienya, Krobo, North Tema, Nungua, Prampram, South Tema, Akim Tafo, Koforidua and Nkawkaw. Meanwhile, Kamstrup is distributed in Dodowa, Kwabenya, Legon, Makola, Akuapim-Mampong, Roman Ridge, Teshie, Krobo, and Prampram. Enter smart is distributed to Ashanti and the Eastern regions for reasons best known to ECG.

2.3.4 General Smart Meter Features

Usually, customers have a Radio-frequency identification (RFID) Card with a contactless smart card to load money onto the meter from the vending point. Some come with User Interface Unit and GPRS technology to read data from meters. But in the case of (e-cash 1), customers are given a smart card, which they use to load money onto the meter from the vending station. Billing to customers is processed inside the meter. The meter receives the cash and computes the tariff when the Customer consumes electricity each month. Levies, VAT and NHIL are all calculated inside the meter. The service charge is based on the previous month's consumption. It is a charge on the Customer's 1st visit in the new month; additionally, Subsidies are also given at the vending station every new month based on the Customer's first visit. In the case of Kastrup, billing is processed on the server. Hence, the server's energy charges whenever the meter communicates to the server. The service charge, levies, VAT and NHIL and subsidies computations are also done on the server and transmitted to the meter. The service charge is affected on the first day of the month; subsidies and differences in service charges are deducted on the First Day of every new month.

2.4 Research method

2.4.1 Research Design

The approach of our current study is purely quantitative. We sought to use this approach because it involves an empirical enquiry into perceived quality and customer satisfaction. It also evaluates the mediating role of meter brands from the Customer's perspective. Therefore, quantitative data was employed using the survey method to collect and gather the information required for the analysis.

2.4.2 Instrumentation

The sources listed in Table 1 were used as the foundation for developing a survey questionnaire used to collect information from ECG customers, with a few modifications. Details on the questionnaires were demographic details and customer satisfaction. In addition, we used reliability, tangibility, empathy, responsiveness, security, stability, and assurance to measure perceived quality. Items were measured using the 5-point Likert scale anchored with 1 = strongly disagree, 2=disagree, 3= Neutral,4=agree, and 5= strongly agree. The final section's questions explore test items on customer satisfaction.

2.4.3 Data Collection

Primary and secondary data were employed in this investigation. Based on the proposed Conceptual framework for service quality in Table 1, we developed a questionnaire for gathering primary data on seven (7) service quality-related factors. Other items conceded were customer satisfaction, and the demographics of respondents form part of the item on the instrument for data collection. As part of the secondary data sources, the authors reviewed existing literature on service quality from different service industries specific and various journals to understand the current issues in service quality. In the case of our secondary data source, we reviewed several articles on service quality specific to different industries from various journals to understand the scope of existing studies. Professionals validated and peer-reviewed Questionnaires [(25)] before being deployed by the field researchers from business and non-business customers of ECG in Ghana, which formed the basis of our population for the current study. From the study population, we chose three (3) municipalities within the Greater Accra Region (GA East, GA-west and Adenta Municipality) and Akweapim South municipality in the Eastern Region. Survey time was between 9 a.m. and 5 p.m. daily, including weekends. The authors aim to obtain customer perception regarding service quality on smart meters.

2.4.4 Sampling and Sample Size

The authors adopted a purposive sampling approach because we intercept respondents at the various vendor points purchasing credit for the smart meters. Our Sample size is calculated based on Yamane's 1967 formula with a 95 per cent confidence level with plus or minus five (5) per cent confidence intervals using the formula $n = N/1+N(e)^2$ where n= is the sample size N =is the population, and e = is the error margin. We obtained 470 as our sample size; we received 324 questionnaires from respondents representing 68.9% of the 470 questionnaires deployed by our field researchers from the basis of our analysis.

3 Results and Discussion

Data capturing and transformation were done using SPSS. Authors then adopted PLS-SEM to simultaneously estimate causal relationships between exogenous and endogenous constructs [26,27]. We used PLS-SEM for this study because it best estimates our proposed model. Based on the recommendation by [26], we began with some preliminary tests, such as the non-response bias test and data screening for missing values. We also performed other validity and reliability checks before performing the PLS-SEM analysis. We then begin estimating our measurement model to determine the reliability and validity of our results and continue to evaluate our proposed model's structural model. See Table 2 on respondents' profiles

Table 2. Respondent Profile

Attributes	Categories	Frequency	Percentage
Age	18-29	109	33.6
	30-49	159	49.1
	50-69	51	15.7
	90 and above	5	1.5
Gender	Male	221	68.2
	Female	103	31.8
Meter Brand	Smart G	86	26.5
	E-cash	69	21.3
	Enersmart	83	25.6
	Kamstrup	86	26.5
Residential Type	Business	170	52.5
	Non-Business	154	47.5

3.1 Measurement Model

At the measurement model assessment level, (2) items avResponsiveness, and avSecurity were identified with low factor loadings being less than 0.600; these items were eliminated as part of the indicators for measuring the construct for Perceived Quality per the recommendation of [26]. A score above 0.8 denotes strong reliability, whereas values above 0.7 imply adequate reliability [27]. We employ Cronbach's alpha and the composite reliability for each component of the model has values greater than 0.6 and 0.70, satisfying the Fornell & Larcker criterion for internal consistency. We also assess convergent validity as recommended by [27]. All Average Variance Extracted (AVE) values are above 0.5 [27] with indicator loadings above 0.5 [27] for assessing the convergent validity as recommended by [27]. Table 3 gives an indication of average variance extracted (AVE), cross-loadings, composite reliability (CR), and rho_A were used to assess convergent validity. It can be seen in Tables 4 and 5, respectively, in reporting discriminant validity. Authors use the functions for the Heterotrait-monotrait ratio (HTMT) of correlation [27] and the Fornell–Larcker criterion as recommended [26]

3.2 Structural Model Analysis

To evaluate the path coefficient between endogenous and exogenous constructs, the authors considered the variance explained by the exogenous constructs; the degree and strength of each path were all observed for each Hypothesis in agreement with the proposed model. We applied bootstrapping to estimate the significance of each path. The authors also use the Coefficient of determination (R^2), and standardized root means square residual (SRMR) to assess the quality of the proposed model as recommended by [26]. Evidence of results is shown in (Table 6Figure 4). The analysis results indicate that Perceived Quality has a significant positive relationship with Customer Satisfaction with values (β = 0.701; p =0.000) which shows that H1 is supported. The results also reveal that Meter Brand has a positive relationship with Customer Satisfaction but is not significant with values. (β = 050; p =0.261). It indicates that H2 is rejected. However, H3 seek to test the mediation role of Meter Brand from Perceived Quality to Customer Satisfaction and also shows a positive and significant relationship with values of (β = -0.150; p =0.038); hence H3 is also supported. In measuring the predictive accuracy of the proposed model, we used the Coefficient of determination (R^2), which signify the variance explained by the exogenous variables. R^2 values range from 0 to 1; A higher value is said to have a higher level of R^2 of .75 is substantial, .50 is moderate, and .25 is measured as weak [26]. This study shows that Customer Satisfaction (0.504, moderate) and Meter Brand with a value of (0.023) are weak. In conclusion, this indicates a sufficient level of R^2 (See Table 7 and Figure 4 below. Determining the mediation role of the Meter Brand effect between

Table 3. Indicator Loadings and Internal Consistency Reliability

		Customer Satisfaction	Meter Brand	Perceived Quality	CA	rho_A	CR	AVE
Customer Satisfaction	CUSSF1	0.814	0.156	0.495	0.7060	0.7960	0.8290	0.6210
	CUSSF2	0.878	0.114	0.733				
	CUSSF3	0.656	0.106	0.349				
Meter Brand	Mbrnd1	0.168	0.873	0.168	0.8340	0.9370	0.8780	0.6440
	Mbrnd2	0.072	0.790	0.039				
	Mbrnd3	0.04	0.768	0.055				
	Mbrnd4	0.129	0.775	0.125				
Perceived Quality	avAssurance	0.519	0.006	0.716	0.8040	0.8110	0.8640	0.5600
	avEmpathy	0.431	0.107	0.778				
	avReliability	0.514	0.171	0.768				
	avStability	0.651	0.101	0.769				
	avTangilibity	0.488	0.175	0.707				

Table 4. Heterotrait-Monotrait Ratio (HTMT)

	Customer Satisfaction	Meter Brand	Perceived Quality
Customer Satisfaction			
Meter Brand	0.175		
Perceived Quality	0.865	0.163	

Table 5. Fornell–Larcker Criterion

	Customer Satisfaction	Meter Brand	Perceived Quality
Customer Satisfaction	0.788		
Meter Brand	0.155	0.803	
Perceived Quality	0.709	0.15	0.748

Perceived Quality and Customer Satisfaction reveals that the total impact of Perceived Quality on Customer Satisfaction is positively related and significant (H3: β = 0.709, p= 0.000). With the inclusion of Meter Brand as a mediator variable, the impact of Perceived Quality and Customer Satisfaction, although it shows a positive relationship, is not significant (β = 0.007, p=0.338). The indirect effect of Perceived Quality on Customer Satisfaction through Meter Brand has a positive relationship and is not significant (β = 0.007, p=0.338) (see Table 7). It indicates no effect; hence there is no mediation from the meter brand between Perceived Quality and Customer Satisfaction.

Table 6. Path Coefficient Results

		β	T Statistics	P Values	Result
H1	Perceived Quality -> Customer Satisfaction	0.701	18.433	0.000	support
H2	Meter Brand -> Customer Satisfaction	0.050	1.124	0.261	Not Support
H3	Perceived Quality -> Meter Brand	0.150	2.083	0.038	support
		R^2	Q^2		
	Customer Satisfaction	0.504	0.490		
	Meter Brand	0.023	0.012		

Table 7. Mediation Analysis Results

	Total Effect			Direct Effect				Indirect Effect		
	PATH	T Statistics	P Values	PATH	T Statistics	P Values		PATH	T Statistics	P Values
Perceived Quality -> Customer Satisfaction	0.709	19.587	0.000	0.007	0.960	0.338	Perceived Quality -> Meter Brand -> Customer Satisfaction	0.007	0.960	0.338

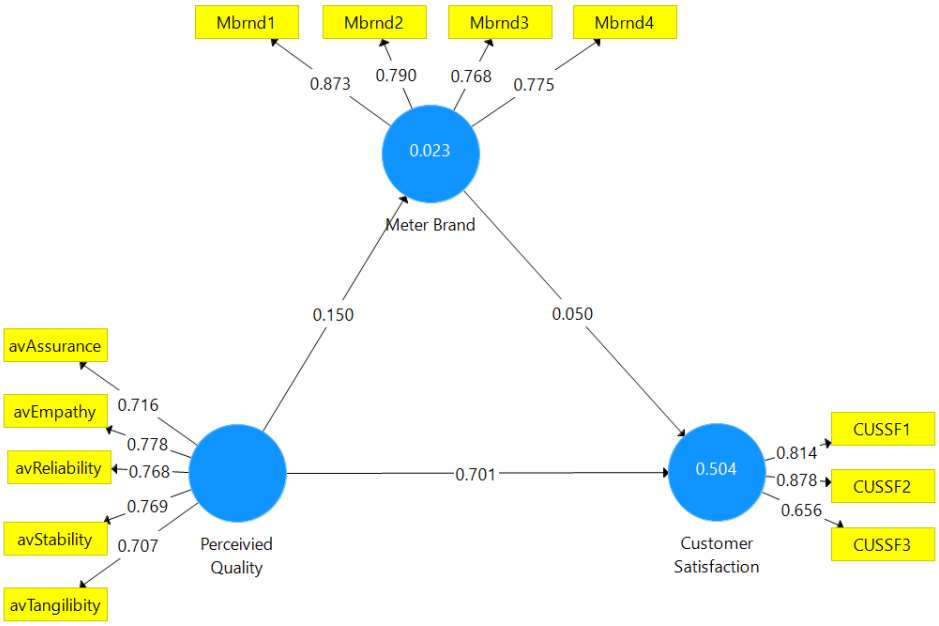

Fig 4. PLS results for the structural model

3.3 Implications for the Study

The study contributes to the existing service quality model, which seeks to examine the relationships between Perceived Quality, Customer satisfaction, and the meter brand mediating between Perceived Quality and Customer Satisfaction. The authors seek to investigate whether or not business and non-business customers of ECG are facing some challenges with the introduction of smart meters. The study has implications for the relevant literature and the service industries, particularly the power distribution sector. Hypothesis (H1) for this study emphasizes the significance of a smart meter's perceived quality in predicting customer satisfaction with the billing service quality of the meter. This can assist ECG in improving their managerial and operational strategies and increasing profit. ECG as a business should make it their top strategic priority to guarantee that their clients continue to view them as a reputable and dependable source of various services. In Hypothesis H2, we assessed the effect of Meter Brand on Customer Satisfaction; although results revealed a positive relationship with Customer Satisfaction, it was not significant. From the perspective of customers, this could imply that customers are experiencing issues such as unreliable meter stability that is questionable and thus inefficient. It is also possible that the brands in use are not good enough, to the point where some customers have even requested a replacement for these meters. Hence, the service provider is obliged to carefully evaluate the various brands of meters to ensure they are of high quality and meet customer satisfaction.

4 Conclusion

Understanding the connection between service quality and customer satisfaction can help managers in the electricity distribution sector better meet the expectations of their consumers. Thus, the findings of this study contribute to an improved theoretical understanding of how service quality affects the satisfaction of a business's customers. The study assesses how perceived quality affects customer satisfaction using meter brands as a mediating variable. The study's findings demonstrate a strong positive relationship between Perceived Quality and Customer Satisfaction ($\beta = 0.701$; p =0.000). The data also show a positive and substantial link between Perceived Quality and Customer Satisfaction, with Meter Brand acting as a mediator ($\beta =$ -0.150; p =0.038). Meanwhile, the study fails to find a statistically significant relationship between Meter Brand and Customer Satisfaction ($\beta = 050$; p =0.261). Conceivably, this means that smart-meter users are content. Because of that transparent pricing, customers feel like they are being treated optimally by ECG. The authors examine how perceived quality and meter brands influence customer satisfaction. The findings of the study also reveal no mediation effect from the meter brand between perceived quality and customer satisfaction; this could mean that the brand of a meter provided to the consumer does not influence the challenges encountered by the customer. It further explains why service providers confidently deploy different meter brands for customers. Because awareness of stakeholders' hopes and concerns surrounding the technology and its rollout is critical, Our proposed methodology can be used by practitioners in the future to evaluate service quality, notably in the power distribution sector, with a larger sample size that yields more rigorous and convincing results by expanding the study to other regions of the country. With electricity consumption, technology is seen as revolutionary. The findings will enable smart meter manufacturers and policymakers to roll out more specialized value-added services and support activities, resulting in greater adoption among stakeholders gaining from the metering technology.

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