

Adoption of Prepaid Electricity Metering System and Customer Satisfaction in Nairobi County, Kenya

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Abstract: *The general objective of the study was to find out the relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya. The study was guided by the following specific objectives: To establish the effect of costing on prepaid electricity on customer satisfaction; To determine the effect of reliability on prepaid electricity on customer satisfaction; To determine the effect of availability on prepaid electricity on customer satisfaction; To evaluate the effect of flexibility on prepaid electricity on customer satisfaction. The study adopted descriptive research design. The target population was 1200 KPLC customers whose meters had been converted from postpaid to prepaid metering system. The sample size was 138 out of which 120 responded. The study used stratified sampling procedure. Inferential statistics was carried out that involved regressions analysis using a multiple linear regression model to establish the relationship between prepaid metering system and customer satisfaction in Nairobi County. The study findings established that there is a relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya. The major factors established by the study that influence the adoption of prepaid electricity metering system and customer satisfaction were: costing; reliability; availability and flexibility. The study established a weak positive correlation between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya.*

Keywords: Prepaid electricity metering system, customers satisfaction

1. Introduction

Prepaid metering in its simplest form refers to paying for electricity, gas or energy before it is used or it's an upfront form of payment. The consumer purchases credit and uses then the resource until the credit expires (Chandler, 2005). Baptista (2013) noted that pre-paid electricity gives consumers autonomy of electricity use and divisibility of energy purchases. Pre-paid model facilitates forms of sociability and social ordering that are not only exclusively economic, but also political, familiar and technological. In Mozambique, the peri-urban dwellers welcomed pre-paid electricity model since they felt empowered (Baptista, 2013). Tewari (2003) and Baptista, (2013) concurred that energy specialists, economists and development scholars are generally positive about benefits of pre-paid model to both consumers and utility producers. Globally, the use prepaid meters have been in use for long period where the prepaid metering has been adopted by customers (Anderson, & Fuloria, 2010). In USA it was reported that 55 percent of residential customers opted to use the prepaid system. According to Anderson and Bezuidenhout, (2010) the United Kingdom adoption of prepaid meters has considerably increased their revenue collection efficiency. In Australia, Casarin and Nicollier, (2009) established that prepaid meters in electricity reduces overheads and thus leading to increased profitability in organizations. In China electricity is reported that customers on prepaid method use 24.2% less electricity than the average customer were using before the prepaid systems. In India, Misra and King, (2012) noted that human handling should be eliminated from all billing processes to prevent fraud and billing errors. Research done by World Bank on revenue collection revealed that the metering and billing have increased from 2% of customers who make up 34 per cent of revenue. Through installation of new meters, revenue increased by

US\$ 72 million. The utility now employs 100% metering on all service connections, which are read monthly (World Bank, 2012).

In Ghana, prepaid metering was adopted by the country's monopoly power distributor, Electricity Company of Ghana (ECG) among other things to deal with supply side challenges such as reduction in collection expenses, eliminate bad debts, efficient cash flows with an overall aim of improving the financial position of the company. Despite the benefits enumerated by the power provider in convincing consumers in accepting the new policy, paradoxically, anecdotal evidence points to the fact that, majority of consumers have contrary opinion regarding the usage of prepaid meters (Ackah, 2015).

Prepaid meter system is a success story for low cost of operation and improves customer service delivery in the developed nations. In states such as South Africa, Egypt and Nigeria among others, prepaid system is explicitly used in water, energy distribution among others. Sub-Saharan Africa trails other regions in providing access to electricity for poor urban and rural residents. This poor performance can be linked to various factors, including political interference in utility policy, higher investment costs and lower profitability of extending service to rural areas. But a major obstacle to wider access is high charges consumers must pay to connect to the electricity network.

In 2009, the Kenya Power launched a pilot basis pre-paid electricity meters for domestic users within Nairobi area and in some other bigger towns like Kisumu and Nakuru. The introduction of prepaid metering by the company was prompted by the fact that the postpaid system had various challenges which included inefficient monitoring of consumption, wrong meter reading, ineffective revenue

collection and inefficient energy use. However, the installation project was slowed down to address crucial issues such as consumer education, logistics and faulty meters. This led to regular complains and even consumers questioned the image of the company. The prepayment system had various shortcomings like faulty gargets, poor consumer knowledge on how to use the new technology and confusing billings. So far, the reality on the ground is far from Kenya Power's assertion as many customer complaints still concerns this issue. Or rather, customers don't easily feel the benefit of the prepaid metering as put by Anderson (2011).

2. Statement of the Problem

According to Kenya Power (2009), the postpaid electricity metering system has been blamed for very many customer complaints. In addition, energy provision companies are unable to keep track of the changing demand for domestic consumers as some consumers face problems of being invoiced for bills that have already been paid as well as poor reliability of electricity supply. Kenya Power introduced prepaid metering to improve customers satisfaction (Kenya Power 2013).

Local studies by Kioko (2013) sought to establish the perceived effect of prepaid meters adoption on revenue collection efficiency. Mburu and Sathyamoorthi, (2014) did a study on switching from Post-paid to Pre-paid Models on customer perception and the organizational role in managing the change. The study sought investigated the customers' perception and the organizational role in managing the change from post-paid to pre-paid models. These studies failed to look adoption and consumers' satisfaction in Kenya. It's to this research gap that the researcher will look on relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya to determine how costing, reliability, availability and flexibility affect prepaid electricity metering system adoption on customer satisfaction in Kenya.

Objectives of the Study

The general objective of this research was to establish the relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya

Specific Objectives included:

- 1) To establish the effect of costing on prepaid electricity on customer satisfaction Nairobi County, Kenya.
- 2) To determine the effect of reliability on prepaid electricity on customer satisfaction Nairobi County, Kenya.
- 3) To determine the effect of availability on prepaid electricity on customer satisfaction Nairobi County, Kenya.
- 4) To evaluate the effect of flexibility on prepaid electricity on customer satisfaction Nairobi County, Kenya.

3. Literature Review

3.1 Theoretical Foundation of the Study

This study is founded on theories of customer satisfaction especially the Expectancy Disconfirmation Theory (EDT) and the Value-Percept Disparity Theory and Cognitive Dissonance Theory.

3.1.1 The Expectancy Disconfirmation Theory (EDT)

The Expectancy Disconfirmation Theory (EDT) was developed by Oliver (2007; 2010). The model implies that consumers purchase goods and services with pre-purchase expectations about the anticipated performance. The expectation level then becomes a standard against which the product is judged. That is, once the product or service has been used, outcomes are compared against expectations.

3.1.2 The Value-Percept Disparity Theory

This theory was originally formulated by Locke (2007, 2009), it asserts that customer satisfaction/dissatisfaction is an emotional response triggered by a cognitive-evaluative process in which the perceptions of or beliefs about an object, action, or condition are compared to one's values, needs, wants and desires. The smaller the disparity between percepts of the object, action, or condition, and one's values the more favorable the evaluation and the greater the generation of positive effect associated with goal attainment, i.e., satisfaction. Conversely, the greater the value-percept disparity, the less favorable the evaluation, the less the generation of positive affect, and the greater the generation of negative effect associated with goal frustration (Griffin & Hauser 2006).

Since it is the attainment of values which consumers seek i.e. the reliability and accessibility of pre-paid metering system of electricity, these actions are simply tested against the extent to which they meet the customer's values. The products may provide more of an attribute or outcome than what is desired, this has no impact on satisfaction unless this aspect causes a blockage in the attainment of another value (Kessler, 2013).

3.1.3 Cognitive Dissonance Theory

Cognitive dissonance is an uncomfortable feeling caused by holding two contradictory ideas simultaneously. The theory of cognitive dissonance proposes that people have a motivational drive to reduce dissonance by changing their attitudes, beliefs, and behaviours, or by justifying or rationalizing them.

The phenomenon of cognitive dissonance, originally stated by Festinger in 1957, has been quickly adopted by consumer behaviour research. "Described as a psychologically uncomfortable state that arises from the existence of contradictory (dissonant, non-fitting) relations among cognitive elements (Festinger, 1957) cognitive dissonance revealed high exploratory power in explaining the state of discomfort buyers are often in after they made a purchase.

Customer's satisfaction in power supply by Kenya Power in the use of prepaid metering system is also grounded on the cognitive dissonance theory. The customers had the

perception that the prepaid metering system would be very reliable and cost effective. As postulated by the theory, customers' expectations were very high in the effectiveness of the prepaid metering system especially because they thought it would be cheaper than prior metering system. Most consumers especially those living in rented house where meter sharing is common have been complaining that since they began using the prepaid meter, they spend more than usual. They feel that the prepaid meter run fast and they spend twice as much as what they used to spend on the postpaid meter. Many consumers believe that this cash and carry system has made life a bit difficult since they always have to budget for it in daily lives unlike the postpaid where they could settle in parts.

3.2 Empirical Review

3.2.1 Customer Satisfaction

According to Wong (2003), customer satisfaction refers to the degree or extent of satisfaction or contentment provided by the goods or services provided by the supplier. It is the degree to which the product meets or exceeds the customer's expectations. Chen and Petrovic-Lazarevic (2004), customer satisfaction is determined as "the number of customers, or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals. It is measured by the number of repeat customers. It is however not a straight forward process to determine customer satisfaction because it varies from person to person and there are many variables in between which are either psychological or physical or both (Communities Scotland, 2006). Therefore, perception greatly affects the level of customer satisfaction (Griffin & Hauser, 2006). Measurement of customer satisfaction uses the analysis of customer feedback as only the customer can accurately rate satisfaction.

To achieve customer satisfaction, companies are encouraged to adhere to the ISO 9000 standards. The ISO 9000 standards are an international agreement on total quality management practices and consist of standards for this. Kessler (2003) found out that a good quality management system should enhance customer satisfaction, address quality requirements of the customer and help an organization to comply with the relevant regulations outlined

3.2.2 Costing

According to Westney (2011), in other countries the objectives for prepaid electric billing system were to increase access to electric energy by low income households and to boost revenue collection, the same may be said of Kenya Power Company. But even with countries where the introduction of prepaid electric billing had clear objectives, it has never been established whether such objectives have ever been achieved, and if not why. The continued use of postpaid electric meters in countries like South Africa two and a half decades after the introduction of postpaid meters may point to possible challenges in the adoption of prepaid meters (Barsky, 2010

The perspectives of Chandler (2005) believe that prepaid system results in mixed financial fortunes to energy provider

and consumers. For instance, prepayment systems may result in a decrease in metering, billing and disconnection and reconnection costs to energy provider. This is brought on by the fact that payment is made prior to consumption, which implies a significant improvement in revenue collection and a reduction in working capital. From the consumer's perspective, prepayment systems may result in a better understanding of how much energy is being consumed, inducing more control of energy use and budget management. Rogers (2005) adds that the system as a whole should be cost effective to facilitate deployment on a large volume. The economic viability should come from reduced operating costs for the utility, upfront cash collection, reduction in customer complaints, odd hour complaints, failure rate of meters. The system should be cheap and easy to start and scalable for out of area sales.

It is evident that some factors that affect the cost of electricity are beyond the company's control (Reuters, November 23, 2009). Therefore, it is difficult to regulate the cost of electricity internally. The cost of connecting new customers in Kenya has tripled since it was last reviewed in 2004. This has deterred potential customers and consequently reduced the company's profits. The company loses money every time it connects a new customer although failing to connect new customers leaves tariff increment as the only source of income for the company. Chandler (2005) established that the Ministry of Energy has come to the aid of Kenya Power by offering to offset the bill to connect customers that are within the radius of 600m from a transformer.

3.2.3 Reliability

According to Bateson (2011), reliability of power supply can be defined as the ability to meet the electricity needs of customers even when unexpected equipment fails or other conditions reduce the amount of available power supply. It is a measure of the capability of electricity networks to withstand sudden disturbances or unanticipated losses in system components. This can be caused by natural or man-made events. Reliability also means maintaining adequate resources to provide customers with round-the-clock supply of electricity at the proper voltage and frequency. Reliability also involves quick response to power outages. Providing reliable electricity supply is however very difficult and requires continuous control of thousands of generators (Besterfield et al., 2010). Cleland and Ireland (2007) established that an energy source is deemed reliable if it generates electrical output and meets demand even at peak time. However, all energy sources have weaknesses and strengths therefore electrical utility companies need to have different sources of energy to enhance electricity reliability. This is referred to as the energy mix. Energy mix is a combination of alternate energy sources such as wind, gas, solar, nuclear, coal and hydro. One of the major challenges faced by Kenya Power is lack of reliability of electricity supply.

The electrical industry in Kenya relies mainly on renewable energy sources like hydro, oil and geothermal power (Kenya – U.S. Energy Information Administration (EIA), 2013). Kenya power, is also in the process of replacing overhead lines in the central business districts and environs with

underground cables (Kenya Power Central Office, Engineering Department, 2014). Underground cables are less susceptible to faults caused by strong winds, heavy rains and fallen trees. Kenya Power is also in the process of building new substations to bring power closer to the customer (Eng. Masibo, Kenya Power 2014).

3.2.4 Availability

According to Devinda and Ramesh (2010), power utilities in India have been striving hard to extend best possible support to customers by improving revenue collection efficiency. Meter reading, preparation of bills its distribution and collection of payments takes away a considerable amount of time and efforts for the utility which can be eliminated by the prepayment metering system. Kwan and Moghavvemi, 2012 interestingly found out that electricity supply is one of the only commodity at present which is billed after it is consumed, everything else we use in life (cooking gas, prepaid mobiles, grocery, clothes etc.) is paid for before it's used. Demand side management, improved quality of supply along with high customer satisfaction has resulted in acceptance of the new system by utilities everywhere.

Kenya Power is slowly catching up with advances in technology although the company had been lagging behind for a good amount of time. Previously, most communication was done via tradition methods such as printed electricity bills sent by mail, complaints addressed via telephone and electricity bills being paid only over the counter. At the moment, printed internal newsletters are still in circulation though they are being phased out to be sent via company mail (Kwan & Moghavvemi, 2012).

In addition to traditional bulletin boards, information such as vacancies, transfers and appointments are communicated via email. Social media has also offered a good platform to interact with customers (Kenya Power IT Department, 2014). The company has a number of Facebook pages in different cities and a twitter handle. Customers are able to communicate queries and get responses instantly. Kenya Power has also set up a website where the public can access vacancies, location of the company's branches, telephone contacts, emails, new products, and new innovations and also learn about the company's management team (Kenya Power IT desk, 2104). The company has also released a number of mobile and landline customer care telephone numbers and an interactive website where all queries are addressed from power interruptions to bill inquiries. The company has also started using video-conferencing to conduct meetings with division heads across the country.

3.2.5 Flexibility

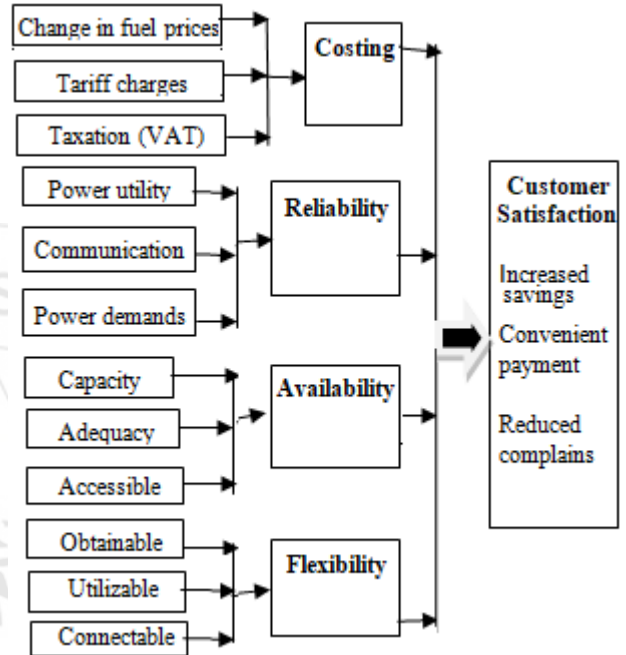
According to Stoner (2009), pre-paid electricity billing was first used in South Africa in mid 1980s. The primary objective was to supply electric power to low income neighborhoods at affordable rates. In 2009, the Kenya power launched on a pilot basis post-paid electricity meters for domestic users within Nairobi area and Kisumu town with an initial connection to 24,000 households (Ogujor, 2007). The concerns for universal service in utilities have motivated firms and regulators to identify technological and regulatory options aimed at encouraging access, and making it easier for consumers to pay for their services. Prepayment

mechanism requires consumers to hold credit and then use the service until the credit is exhausted. In the case of electricity consumers use energy only when they have credit in the electricity account, a supply is discontinued when such credit is exhausted.

3.3.0 Conceptual Framework

The independent variables included the various effects of the prepaid metering system on consumers' satisfaction in Kenya.

Parameters Independent Variables Dependent variables



Research Methodology

The study used both descriptive research designs and quantitative. This descriptive research design was preferred because the study needed to assess the effects of the prepaid metering system on consumer's satisfaction with a particular focus on Kenya power. The study also used qualitative design used on the inferential sections of this study, according to Yin, (2004) it allows for in-depth contextual analysis. The study targeted prepaid electricity meter users in Nairobi. The research focused on customers who had their power meter converted from postpaid to prepaid meter within the past one year (Kenya Power, 2012). The target population was considered appropriate for providing a focal point for the study as regards the impact of prepaid meters on customer satisfaction. The study used stratified sampling procedure with proportional allocation to categorize prepaid meter user into three sectors (strata), namely commercial, domestic and industrial users. The method was due to the assortment nature of prepaid electricity users. The sample was calculated using Fishers (1995) which has ideal formula for targeted population. The sample size of the study was 138 respondents. Primary Data was collected using questionnaires. The questionnaire was structured on both open and close ended questions. Construction of the questionnaire was built so that respondents would have minimal possibility of false interpretations among the different questions and answer options. Cronbach Alpha (α) was used to test validity of the research instrument. To measure the validity of the data collection instruments an

internal consistency technique using Cronbach's alpha was applied. The output gave Reliability Statistics which showed Cronbach's alpha of 0.701. According to George & Mallery, (2003) Cronbach's alpha of 0.7 or above is reliable. To test the reliability of the research instruments, test re-test technique was used.

In inferential statistics, the researcher used a linear regression model to establish the relationship between prepaid metering system and customer satisfaction in Nairobi County.

3.4 Analytical Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y = Customer's Satisfaction

β_0 = Constant

X_1 = Costing

X_2 = Reliability

X_3 = Availability

X_4 = Flexibility

ε = Stochastic disturbance error term

3.5 Ethical Issues

To obtain consent, the respondents were informed about the purpose of the study. The respondents were made to understand that the survey is conducted for study purposes.

Anonymity was ensured as some customers, especially internal, feared victimization. The names and personal information of the participants were not disclosed to ensure confidentiality. Only the information relevant to the research was disclosed. The participants were also free to drop out of the research during the process therefore no one was forced to take part. The researcher made a promise to relay the findings of the research to the respondents.

4. Data Analysis

4.1 Response Rate

The researcher distributed questionnaires to 138 prepaid customers whose power meters had been converted from postpaid to prepaid meters within the past one year. The customers included 62 Domestic users, 52 commercial users, and 24 industrial users. Out of these, 120 prepaid metering service users filled and returned the questionnaires making a response rate of 86.96%. This falls within Mugenda and Mugenda's (2003) prescribed significant response rate for statistical analysis, established at a minimal value of 50%.

4.2 Bivariate Linear Correlation Analysis

The correlation between the variables was as shown using linear correlation analysis. The results are presented in Table 4.16.

Table 4.1: Bivariate Correlation on Prepaid Metering Services

Predictor variables		Customer satisfaction (Y)	Costing (X_1)	Reliability (X_2)	Availability (X_3)	Flexibility (X_4)
Customer satisfaction (Y)	Pearson Correlation					
	Sig. (2-tailed)					
	N	119				
Costing (X_1)	Pearson Correlation	.355**				
	Sig. (2-tailed)	.000				
	N	119	120			
Reliability (X_2)	Pearson Correlation	.381**	.449**			
	Sig. (2-tailed)	.000	.000			
	N	119	120	120		
Availability (X_3)	Pearson Correlation	.128	.111	.239**		
	Sig. (2-tailed)	.168	.233	.009		
	N	117	118	118	118	
Flexibility (X_4)	Pearson Correlation	.477**	.185*	.408**	.110	
	Sig. (2-tailed)	.000	.043	.000	.238	
	N	118	119	119	117	119
** . Correlation is significant at the 0.01 level (2-tailed).						
* . Correlation is significant at the 0.05 level (2-tailed).						

The findings in Table 4.16 show that all the predictor variables were shown to have a positive association between them at a significant level of 0.05 and hence included in the analysis. The bivariate linear correlation analysis values are as presented below:

Costing $X_1 = 0.355^{**}$

Reliability $X_2 = 0.381^{**}$

Availability $X_3 = 0.128^{**}$

Flexibility $X_4 = 0.477^{**}$

There was strong positive and significant relationship between flexibility and customer satisfaction (correlation coefficient 0.477**); there is a weak positive relationship between reliability and customer satisfaction (correlation

coefficient 0.381**); the findings reveal a weak positive relationship between costing and customer satisfaction (correlation coefficient 0.335**) and that least registered weak positive relationship between availability and customer satisfaction (correlation coefficient 0.128**). Availability has a positive relationship; the variable was found not statistically significant.

4.3 Inferential Analysis on Prepaid Metering Service

The study sought to establish the relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya.

The factors investigated were: costing; reliability; availability and flexibility. The regression model was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Whereby Y represent the customer satisfaction, X_1 is costing, X_2 is reliability, X_3 is availability and X_4 is flexibility. B_0 is the stochastic disturbance error term and $\beta_1 - \beta_4$ are the regression coefficients.

4.4 Multiple Regression Model Validity

The study sought to determine the ANOVA used to present regression model significance. The findings are presented in Table 4.2.

Table 4.2: Model Validity

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	11.397	4	2.849	12.563	.000 ^b
	Residual	25.173	111	.227		
	Total	36.570	115			
a. Dependent Variable: customer satisfaction						
b. Predictors: (Constant), flexibility, availability, costing and reliability						

The study sought to establish the multiple regression model whether it was valid or not. To this end the F statistics was used to determine model validity. The study found out that the model was valid $F_{(4, 111)} = 12.563$, $P < 0.001$. Therefore, this implies that all the four predictor variables are good in explaining variation in customer satisfaction.

4.5 Multiple Regression Model Summary

The study sought to determine the model's goodness of fit statistics. The findings are presented in Table 4.18.

Table 4.1: Model's Goodness of Fit Statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.558 ^a	0.312	0.287	0.47622	1.811

The coefficient of determination as measured by the R-square (R^2) (31.2%) shows that all the four predictor variables explain 31.2% of the total variation. This implies that the stochastic disturbance error term (ε) cover the rest. This could be explained by the presence of Multi-collinearity and as indicated by the bivariate linear correlation analysis as illustrated by Table 4.16. Durbin Watson test was used as one of the preliminary test for regression which to test whether there is any autocorrelation within the model's residuals. Given that the Durbin Watson value was close to 2 (1.811), there was no autocorrelation in the model's residuals.

4.6 Multiple Regression Variable Coefficients

The study sought to determine the multiple regression variable coefficients. The findings were presented in table 4.19.

Table 4.2: Multiple Regression Variable Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.315	.383		3.437	.001
Costing (X1)	.212	.082	.226	2.574	.011
Reliability (X2)	.110	.086	.123	1.277	.204
Availability (X3)	.026	.076	.028	.348	.729
Flexibility (X4)	.274	.062	.382	4.437	.000

a. Dependent Variable: customer satisfaction (Y)

X_1 was found to be statistically significant and positively related to Y ($\beta_1 = 0.212$, $P = .011$).

X_2 was found to be statistically significant and positively related to Y ($\beta_2 = 0.110$, $P = .204$).

X_3 was found to be statistically significant and positively related to Y ($\beta_3 = 0.026$, $P = .729$).

X_4 was found to be statistically significant and positively related to Y ($\beta_4 = 0.274$, $P = .000$).

5. Summary, Conclusions and Recommendations

5.1 Summary of Findings

The study focused on establishing the relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya.

The study sought to establish effect of costing on prepaid electricity on customer satisfaction. The findings established that the respondents agreed that the consumption is always affected by adjusted fuel charges; KPLC always charges higher taxes which increase the cost of electricity; that the KPLC costing system fluctuates from time to time the cost is unpredictable and that it is cheaper for them to use the prepaid system of payment than the ordinary post-paid. According to Stooner (2009), the cost of electricity is a calculation of the cost of generation at the point of connection. It includes capital/waste disposal costs, cost of operation, government levies, fuel costs and maintenance costs. Some of these costs are beyond the company's control such as fuel costs and government levies.

The study sought to determine the effect of reliability on prepaid electricity on customer satisfaction Nairobi County, Kenya. The findings revealed that the respondents agreed that the prepaid metering installed in the house serves well without breaking down; the company responds to customer complaints and or claims within a reasonable time; KPLC is flexible and has reduced the time from application stage to actual installation and that they have a happy experience with metering service and general services from KPLC. Cleland and Ireland (2007) established that an energy source is deemed reliable if it generates electrical output and meets demand even at peak time. However, all energy sources have weaknesses and strengths therefore electrical utility companies need to have different sources of energy to enhance electricity reliability. This is referred to as the energy mix. Energy mix is a combination of alternate energy sources such as wind, gas, solar, nuclear, coal and hydro.

The study sought to determine the effect of availability on prepaid electricity on customer satisfaction Nairobi County,

Kenya. The study established that the respondents agreed that the service is available to any customer here in Nairobi who require or apply for it; tokens are available all the time when they need them and reconnections are done immediately payments. According to Devinda and Ramesh (2010), they established that power utilities have been striving hard to extend best possible support to customers by improving revenue collection efficiency. Meter reading, preparation of bills its distribution and collection of payments takes away a considerable amount of time and efforts for the utility which can be eliminated by the prepayment metering system.

The study sought to evaluate the effect of flexibility on prepaid electricity on customer satisfaction Nairobi County, Kenya. The study established that the respondents agreed that the customers are able to buy units of electricity with ease at any time; they are able to plan well my electricity usage throughout the month; the service is very user friendly when using it even when feeding the tokens; the prepaid metering service gives me flexibility of usage and many options of purchasing tokens; the prepaid metering system does not limit me due to my education level; the system gives me a warning well in advance before electricity is cut off by the auto gadget and that the company assists customers by advancing credit tokens when a customer is in a financial distress. According to Koohangand (2003) the technology developers and inventors of prepayment systems need to understand how users perceive and react to elements of new technology along with how to most effectively apply it in enhancing service delivery and customer satisfaction. Grandon, Alshare, and Kwan, (2005) argue that knowing users' intentions and understanding the factors that influence consumers' beliefs about prepaid metering system can help system administrators and managers to create mechanisms for attracting more customers to adopt this new technology.

The study established that relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya. The findings reveal that KPLC's improved service delivery enables them to buy electricity at affordable prices; the service delivery enables them to buy token units and 'sambaza' it to a friend; they are able to budget and regulate their electricity consumption on monthly basis; they are happy with most of the services given in prepaid platform; they can recommend to family members, neighbours and or other customers to install prepaid service; they have freedom in that nobody bothers them with electricity bills and that they have increased the number of units they use in a month. According to Erevelles and Leavitt (2004), in total quality management, eight principles are outlined to aid organizations achieve customer satisfaction. A quality management principle is a fundamental rule for operating an organization. It is aimed at improving organization performance by focusing on customers while addressing stakeholders' concerns.

The study inferential analysis established a weak positive correlation between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya. The study deduced that among the variables studied, flexibility was identified to have a great impact on customer satisfaction, registering coefficient of 0.274 while

availability registered the least coefficient value of 0.026 indicating that it had the least impact on customer satisfaction.

5.2 Conclusion

The study made conclusions based on the study findings. The study concluded that there is a relationship between adoption of prepaid electricity metering system and customer satisfaction in Nairobi County, Kenya. The major factors established by the study that influence the adoption of prepaid electricity metering system and customer satisfaction were: costing; reliability; availability and flexibility. costing of prepaid metering services is influenced by fuel charges; taxes; fluctuations; costing system and affordability. The KPLC costing system fluctuates from time to time the cost is unpredictable and that it is cheaper for the customers to use the prepaid system of payment than the ordinary post-paid.

Reliability of the prepaid metering services is inclined by installation of prepaid metering systems; electrical interruptions; reduced time from application to installation stage; response to customer calls to electricity interruptions; the customers can recommend the prepaid metering system to be installed to a friend or an immediate family member and the customers are happy with prepaid experience with metering service and general services from KPLC.

Availability of the prepaid metering services is determined by accessibility of metering service to customers anywhere in Nairobi; company staff are accessible any time; regular maintenance services offered to customers; customer care number is reachable at all times; tokens are available all the time when needed; reconnections done; proximity of KPLC office and KPLC staff handles customers with courtesy.

Flexibility of the prepaid metering services was affected by ability of customers to buy tokens with ease; plan well for electricity usage; friendly user; options in purchase of tokens; does not involve literacy use; early warning to purchase tokens and facilitating credit tokens to customers.

The study concluded that customer satisfaction with the service delivery was indicated by improved service delivery that enables customers to buy electricity at affordable prices; features such as *sambaza* tokens has facilitated sharing of tokens; company ensures that there are no hidden charges to customers who buy the minimum tokens; enable to budget and regulate electricity consumption on monthly basis; the customers are happy with most of the services given in prepaid platform; the customers would recommend family members, neighbours and or other customers to install prepaid service; the customers have freedom in that nobody bothers me with electricity bills; the customers are treated well by the KPLC staff and that the customers have increased the number of units they use in a month.

5.3 Recommendations

The study made recommendations based on the study findings.

The study recommended that costing of prepaid metering services should facilitate cheaper costing systems that do not affect electricity consumption.

The study recommends that reliability of prepaid metering services should oversee that the company gives notice of electricity interruption before actual interruption implementation; the company responds to customer complaints and or claims within a reasonable time and KPLC responds quickly to customer calls when there is an explained electricity interruption.

The study recommends that availability of prepaid metering services should enable accessibility of prepaid metering services; regular maintenance services should be offered by the company; the customer care number should be more available when needed and that reconnections should be done immediately payments are done.

The study recommends that flexibility of the prepaid metering services should facilitate for ease of use of the prepaid metering system and facilitate more options of payments for tokens.

The study recommends that there should be better service delivery by KPLC to give customer satisfaction. The company should facilitate customers to buy electricity at affordable prices; *samabaza* token units to other prepaid metering users; the company should ensure that there are no hidden charges to customers who buy the minimum and the company staff should treat the customers well.

The study also recommends that good quality management system should enhance customer satisfaction, address quality requirements of the customer and help an organization to comply with the relevant regulations outlined. The study recommends that the organization should aim to comprehend the present and future needs of the customer and work towards meeting these requirements and even exceeding them.

The study recommends that the organization should be cost effective to facilitate deployment on a large volume. The economic viability should come from reduced operating costs for the utility, upfront cash collection, reduction in customer complaints, odd hour complaints, failure rate of meters. The prepaid metering system should be cheap and easy to start and scalable for out of area sales.

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