Customer Satisfaction Characterized by Service Quality for Revenue Collection of Municipal Service in Sri Lanka: A Pilot Study

Pearly Jeewayani Liyanage [a,b*#], Mohd Shukri Ab Yajid [b], Ali Khatibi [b], S. M. Ferdous Azam [b], Jacquline Tham [b] and S. R. S. N. Sudasinghe [b]

[a] *Sri Lanka Telecom, Sri Lanka.*
[b] *Management and Science University (MSU), Malaysia.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Review Article

ABSTRACT

Municipal councils of a country are public services organizations that have been operating in a market monopoly. The purpose of carrying out a pilot study is to check the appropriateness of the questionnaire and the feasibility of the analytical process before carrying out a comprehensive research study. This pilot study focuses on the service quality dimensions which constitute customer satisfaction of municipality service for carrying out the analysis of inference statistics as customer satisfaction is the key driver of revenue collection. The feasibility of the pilot study confirmed the path for a comprehensive study. The pilot study selected 65 customers in one ward of the Municipal area and 48 respondents had successfully responded to the self-administrative questionnaire. Absolute values of Z-scores by capturing values less than 1.96 for skewness and kurtosis of all model variables confirmed that the probability distribution of all variables was substantially normal. The residual analysis of four assumptions of normality, homogeneity of variance, linearity, and independence confirmed that the validity of all model variables was compatible with linear regression. Cronbach's Alpha indicated that two scales used to constitute the dependent variable of revenue collection needed to be modified and to be validated by another pilot test other than removing.

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[#] *Manager Marketing;*
Corresponding author: E-mail: pearlyjeewayani@gmail.com;

1. INTRODUCTION

This pilot study was intended to assess the validity of the service quality dimensions which constitute customer satisfaction of municipality service for carrying out statistical analysis to determine whether customer satisfaction becomes the key driver of revenue collection.

The Municipal Council (MC) selected for the study is in the central region of Sri Lanka and primary data was collected during the latter part of the year 2020 by selecting a small ward. The MC provides sewer, road, and drainage management, waste management services, supplying safe drinking water and electricity, approval for commercial and residential buildings, and maintaining public places such as recreational parks, playgrounds, vehicle parks.

Thus, the purpose of carrying out a pilot study using a small sample of the target population as a trial exercise is to check: (i) the appropriateness of the questionnaire and to make adjustments; and (ii) the feasibility of analytical process subject to boundary conditions and those enable the researcher to make a prior judgment about carrying out the anticipated comprehensive research study on the same field.

Service quality is the personal and common knowledge of clients living in the services sector which depends among other aspects, on management, employee observation, the interface between people, service promotions, and the clients [1]. Owenvbiugie [2] stated that taxation seems to be the key to national development because it provides the funding for government expenditure on programs aimed at aiding growth and development across all sectors. The study of Mbassi et al. [3] concludes that municipal service delivery can be enhanced through a citizen awareness campaign, to sensitize the local community on various aspects of service delivery including maintenance of the facilities provided. The validity of the pilot study confirms the path followed by a comprehensive study. The degree of customer satisfaction is a measure of the gap between the expected service quality and the perceived service quality which is created in the minds of beneficiaries.

Dissanayake, D.M.R, and Norisnana [4] state that the public sector institutions including local government authorities like municipal councils need to focus on innovative service design to assist stakeholders. Revenue generated by Municipal councils is one of the main sources of funding used for operations and maintenance of the service area by the municipal council. a country. Being a public services organization has been holding a market monopoly. The council members elected by a local government election decide to provide a substantial service to the community living within the municipality service area. The metropolitan area of District Capitals falls under the sovereignty of respective Municipal Council and operates without any rivalry of the monopoly of service-market.

Though the organizations have no internal pressure for improving quality measures of their services, the council members receive immense external pressure from the beneficiaries including voters. Though the market holder captures the freedom of establishing service charges in the absence of competition, the satisfaction level of customers to pay the set price becomes the determinant of revenue generation. encounter customers' dissatisfaction as their services entities Thus the quality of services delivered by the Municipal Council can be assessed through identifying key service quality dimensions.

2. LITERATURE REVIEW

By synthesizing the publications of management scholars and researchers, interdependency among model variables of this study namely, service quality dimensions, customers satisfaction, and revenue collection is established. Thereby, the model variables are described by focusing on Municipal Service activities currently being practiced.

3. SERVICE QUALITY DIMENSIONS

Javadin and Kimasy [5] consider the service as a process that includes a series of intangible activities occurring in the interactions between customers and service provider systems including employees and physical resources to be a solution for customers' problems. Service quality is an integral aspect of offering an organization to improve their loyalty by providing effective and efficient service to their customers [6]. Further, service quality is the degree of achievement that meets customer's standards

which are considered as the ultimate measurement of customer expectations [7].

To determine the dimensions of service quality, various studies have been conducted. Parasuraman et al. as cited by [8] introduced ten factors as dimensions of service quality via SERVQUAL model, later Parasuraman et al. as cited by [8] reduced ten dimensions of service quality to five dimensions of tangible, reliability, responsiveness, assurance (credibility), and empathy. However, Parasuraman et al. [9] describe accessibility being one of ten dimensions as it involves approachability and ease of contact whereby the degree to which the service is easily accessible by telephone, responding with a reasonable waiting time for service delivery, and location and operating time of the service provider. This pilot study included accessibility as the sixth dimension.

The service quality dimension tangibility determines the presence of physical facilities, machinery, personnel, and communications materials which create the first impression about the organization in the mind of the customer. A business should wish all its customers a special good experience and never forget that in the future they are more likely to return [10]. Tangibility elements reflect continuity between cultures [11,12].

The service quality dimension responsiveness refers to the company's ability to help its guests provide healthy high quality and quick service since each customer is respected; more if they get the best service possible [10]. The ability to assist clients and provide timely service is responsiveness. Instead of approaching the business from the perspective of the customer the method of service delivery and the handling of requests [13]. As per Pakurár et al. [14] responsiveness in SERVQUAL 1994 has been rated as the third dimension. This dimension of quality of service is viewed by the quality of service component. However, advances in information technology such as e-mails, websites, and customer service interfaces allow the service provider to react [15].

The service quality dimension assurance describes the degree to which the accountability of service delivery is shouldered by the service providers while serving the customers. If the customers are not happy with the organizational staff, it is very unlikely that the customers will go back to business with the company [10].

Assurance is the intelligence and courtesy of the workers and encourages trust and faith in the organization and its employees [16]. According to Pakurár et al. [14], confidence means the values and behavior of workers and the ability of employees to provide friendly, sympathetic, courteous, and adequate services. Assurance is performed through the people aspect of service quality [15].

The service quality dimension empathy refers to the service providers' ability to feel customers' own emotions. Empathy is important so that customers are unique and specific and understand their needs through personalized or customized service [17]. If the customers feel they get individualized and quality attention there is a very big chance that they will return to the company and do business there again [18]. Multiple quantitative studies have established dimensions of the model for service quality, which have employed security, reputation, and Accessibility to empathy measurement [14]. The quality of this service is recognized by the quality of service aspect [15].

The service quality dimension reliability determines the way that the company conducts and fulfills its promised service quality and precision in compliance with the defined needs of the company and the customer. The reliability of the quality of service is recognized through the human element of quality of service [15]. Reliability is much like a first-hand experience because each customer wishes to know if his or her supplier is reliable and satisfies the set requirements [10].

4. CUSTOMER SATISFACTION

Kotler [19] defined satisfaction as: "a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) concerning his or her expectations. Effects of customer satisfaction in a market monopoly where the customers have no alternative supplier choices, managers are unsure how much to invest in satisfying customers [20]. Customer satisfaction is the outcome that customers received when the service they experienced exceeded their expectation whereby the more positive customers' perceived service quality, the better their satisfaction level with the service provider is likely to be [21]. A study carried out by Mokhlis et al. [22] on customers' satisfaction with the services provided by municipal service indicates

that: i. the five dimensions of SERVQUAL represent a valid instrument to measure municipal service quality; and ii. four service quality dimensions, namely tangibility, empathy, assurance, and responsiveness significantly predicted citizen satisfaction with an adjusted coefficient of determination of 0.5.

5. SERVICE QUALITY DIMENSIONS AND CUSTOMER SATISFACTION

A summary of emphatical studies carried out by management scholars to assess the impact of different service quality dimensions on customer satisfaction are shown in Table 1.

6. GAP BETWEEN EXPECTED AND PERCEIVED SERVICE QUALITY

Zivkovic et al. [26] disclose through a study that quality of municipal service, from the customers' point of view, is not satisfactory, that is there are significant gaps between customers' expectations and their perception of each service quality determinant, especially reliability and responsibility of service. A study carried out by Noor and Nasirun [27] on customers' satisfaction with the services provided by the natural monopoly company indicates that 76.2% of customer satisfaction can be explained by the dimensions indicating satisfaction of services received before the services are performed. A

study carried out by Mokhlis et al. [22] on customers' satisfaction with the services provided by municipal service indicates that: i. the five dimensions of SERVQUAL represent a valid instrument to measure municipal service quality.

7. MODEL VARIABLES

By reviewing the literature, the characteristics of six service quality dimensions related to the services rendered by Municipal Councils in Sri Lanka are summarized in Table 2.

The characteristics listed in Table 2 are used to establish the questions of the self-administrative questionnaire to represent six service quality dimensions.

8. METHODOLOGY

As explained in Table 2, input characteristics of service quality dimensions related to Municipal Service determine the degree of customer satisfaction on which the customer is self-encouraged for paying service taxes. The data were collected by using a self-administrative structured questionnaire, which consists of three sections; (i) respondent's demographic information; (ii) 20 author constructed questions to measure respondents' perception towards the six service quality dimensions; and (iii)

Table 1. Summary of emphatical studies

Author	Service quality dimensions	Findings
Pakurár et al. [14]	Tangibility, Responsiveness, Empathy, Assurance, Reliability, Accessibility, Financial Aspect, and Employee Competences	The service quality dimensions have a positive and significant effect on customer satisfaction
Tran [23])	Tangibility, Reliability, Responsiveness, Assurance, Empathy, Transparency	Responsiveness mostly influences customer satisfaction followed by empathy and reliability.
Bello, Martin and Kashim [24]	Municipal Awareness, Citizen Awareness, and Environmental Awareness	The findings indicate that city knowledge plays a critical role in satisfying the public in the delivery of municipal services.
Wijesekara and Fernando [25]	Responsiveness, Communication, Tangibility, Empathy, Assurance	The probabilistic approach determines the association between variables with 95% confidence
Makumbe and Mukwena [7]	Reliability, Tangibility, Responsiveness Assurance, and Empathy	The findings showed a strong effect upon the satisfaction of customers through reliability, responsivity, empathy, tangibility, and assurance.

Table 2. Characteristics of six service quality dimensions

Model dimensions of service quality	Characteristics of service quality dimensions related to Municipal Services
Reliability	Accuracy of the bills and other information issued to customers, uninterrupted and timely delivery of customer services, reliable and credible transactions, and employees' knowledge to answer queries raised by the customers
Assurance	Transparency of customer service delivery process, security of the valuable documents submitted by the citizens, treating every customer in an equitable and unbiased manner, and providing public utilities in a standard manner, and accuracy of the invoices and receipts issued by the MC
Tangibility	Modern technology used by the MC for receiving information from the citizen and responding to the citizens, physical facilities and logistics provided by the MC to make citizens comfortable, both internal and external arrangements of MC office, and maintenance of the environment
Empathy	The ability of the MC staff to pay personal attention to service seekers, understand the customer needs, clarify the MC procedures, and direct them to the right service units
Responsiveness	Prompt response given by the MC for both oral and written requests of the citizens and advance notifications delivered by the MC management related to public services, and other issues
Accessibility	Friendliness of the MC staff in service delivery process, and information provided through digital communication, mobile applications, and service counter.

respondents' overall satisfaction with services provided by the municipal council and their perception on paying revenue through perceived satisfaction. The respondents rate their level of agreement with each statement using a five-point Likert's scale ranging from 1-totally dissatisfied; 2- satisfaction is below average; 3-satisfaction is in average; 4- satisfaction is above average; and 5- totally satisfied. The questionnaire prepared in English was translated into the local language of Sinhala before distribution.

Statistical analysis was carried out by using SPSS version 25. As fundamental requirements for parametric tests and linear regression analysis, normality of six service quality dimensions and customer satisfaction were statistically tested by the degree of skewness and kurtosis. Before performing linear regression, residual analysis which complies with four assumptions namely: (i) normality; (ii) homogeneity of variance (homoscedasticity); (iii) linearity; and (iv) independence (autocorrelation) was carried out to confirm the validity with said four assumptions.

9. ANALYSIS AND FINDINGS OF THE PILOT STUDY

A pilot study was carried out by involving 65 respondents from one of the Municipality Wards

to validate the feasibility of the questionnaire and 48 had responded successfully. The pilot sample is not large enough to make recommendations. Thus, the objective of the pilot study is to make adjustments to the questionnaire, if necessary, and to finalize the analytical process.

According to Kim [28]; Mishra et al. [29], small samples (n < 50), if absolute z-scores for either skewness or kurtosis are larger than +1.96 or less than -1.96, which corresponds with an alpha level 0.05, then reject the null hypothesis and conclude the distribution of the sample is non-normal. A z-score could be obtained by dividing the skew values or excess kurtosis by their standard errors. Z-score of six service quality dimensions (independent variables), customer satisfaction (mediator variable), and revenue collection (dependent variable) was found values between +1.96 and -1.96 for both skewness, and kurtosis revealing probability distribution of variables are substantially normal. Thus, the data set is compatible for parametric analysis and thereby regression analysis is recommended. Absolute values of z-scores of skewness and kurtosis representing model variables are ranging between 0.1 and 1.86 (less than 1.96) as illustrated in Table 3, confirming the normality of frequency distribution of all model variables.

Table 3. Absolute values of z-scores of skewness and kurtosis (SPSS 25)

Variable	Z Score (Skewness)	Z Score (Kurtosis)
Reliability	0.37	1.22
Assurance	1.48	0.57
Tangibility	1.3	0.36
Empathy	0.51	1.57
Responsiveness	1.54	0.1
Accessibility	0.85	0.48
Customer satisfaction	1.86	0.56
Revenue collection	0.92	1.36

Residual analysis of normality was firstly carried out for mediator variable Vs independent variables and secondly for dependent variable Vs mediator variable. Residual analysis for normality shows a bell-shaped and substantially symmetrical histogram of standardized residuals of linear regression as shown in Fig. 1 a. The scatter plot of expected cumulative plot Vs. observed cumulative probability was aligned close to the diagonal without major deviations as shown in Fig. 1 b. Both test results assured normality.

The residual analysis of homoscedasticity was performed by taking the residual values of the regression of dependent variable vs. independent variables. A uniform distribution of the scatter plot of standardized residual values vs. standardized predicted values free from a cone or a fan shape distribution confirmed the homoscedasticity of the data set as shown in Fig. 2.

The residual analysis of linearity was performed by extending the scatter plot of standardized residual values vs. standardized predicted values to establish the "Loess curve" of the distribution as shown in Fig.3. Loess curve which propagated close to zero line without showing major deviations confirmed the linearity of the residual values.
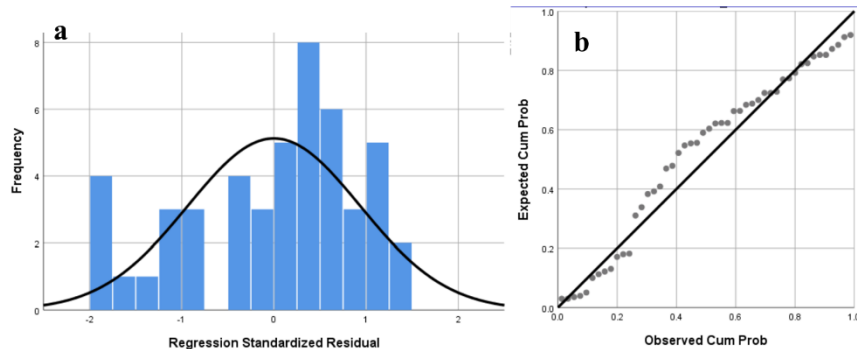

Fig. 1. (a) Histogram of residual distribution; and (b) Scatter plot of expected cumulative plot Vs. observed cumulative probability (SPSS 25)
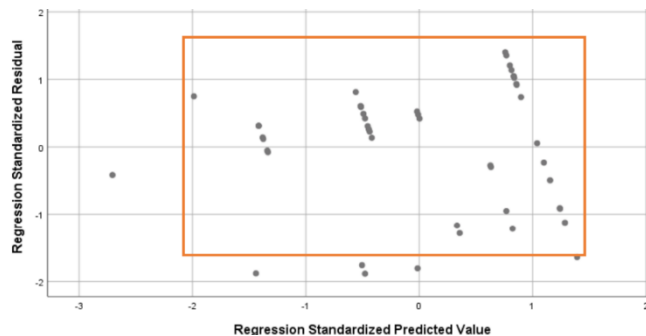

Fig. 2. Scatter plot of standardized residual values vs. standardized predicted values (SPSS 25)
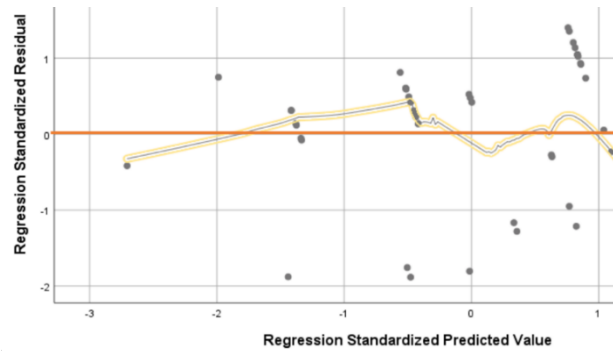
Fig. 3. Losses curve of standardized residual values vs. standardized predicted values (SPSS 25)

The residual analysis of independence or free from autocorrelation of the residual values determines whether there is a residual error associated with one observation that is not correlated with the residual errors of any other observations. When Durbin-Watson statistic is close to 2 (±0.5 around 2), the residual series can be regarded as free of autocorrelation at a certain level (say, α = 0.05) of significance [30]. The Durbin Watson value computed by SPSS 25 was 2.179 which falls between 1.5 and 2.5 and confirms that the residuals are independent or do not have autocorrelation. Since the error term or the residual in the regression model of mediator variable Vs. six independent variables satisfy the said four assumptions, the regression model is considered valid. Results of the multiple linear regression analysis illustrated in Table 4 interpret: (i) the two variables "assurance" and "accessibility" make a significant impact on customer satisfaction as Sig. occupies a value less than 0.05; (ii) the other four variables by occupying Sig. values greater than 0.05 conclude that though there exists an impact from said four variables on customer satisfaction which is not significant.

Before assessing the mediator effect through the Sobel test [31], residual tests for linear regression of dependent variable Vs. mediator variable was carried out. Residual analysis for normality shows a bell-shaped and substantially symmetrical histogram of standardized residuals of linear regression as shown in Fig. 4 a and the scatter plot of expected cumulative plot Vs. observed cumulative probability was aligned close to the diagonal without major deviations as shown in Fig. 4 b. Both test results assured normality.

Table 4. Multiple linear regression analysis of independent variable Vs. Mediator variable

Independent Variables	Unstand. Coef.		Stand. Coef.	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.227	0.312		-0.726	0.472
Reliability	0.01	0.055	0.006	0.181	0.858
Assurance	0.604	0.084	0.602	7.225	0.000
Tangibility	0.071	0.064	0.060	1.100	0.278
Empathy	0.033	0.060	0.026	0.549	0.586
Responsiveness	0.142	0.115	0.122	1.236	0.223
Accessibility	0.24	0.115	0.211	2.094	0.042

Dependent Variable: Customer Satisfaction
Abbreviation: Unstand.- Unstandardized; Coef.- Coefficient;
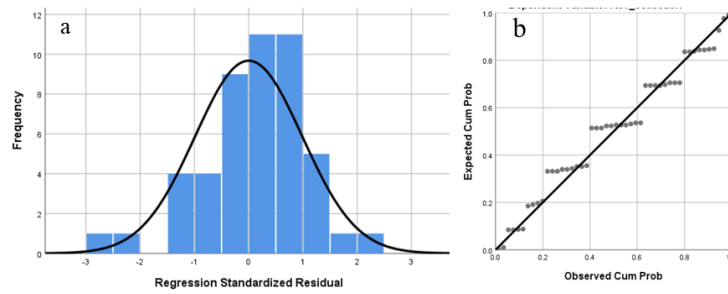*Std.- Standard; Sig.- Significance*

Fig. 4. (a) Histogram of residual distribution; and (b) Scatter plot of expected cumulative plot Vs. observed cumulative probability (source: SPSS 25)
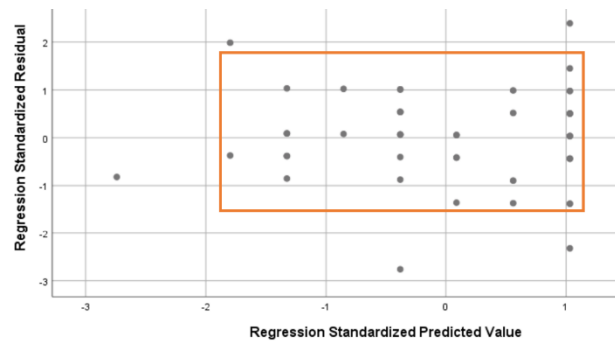

Fig. 5. Scatter plot of standardized residual values vs. standardized predicted values (SPSS 25)
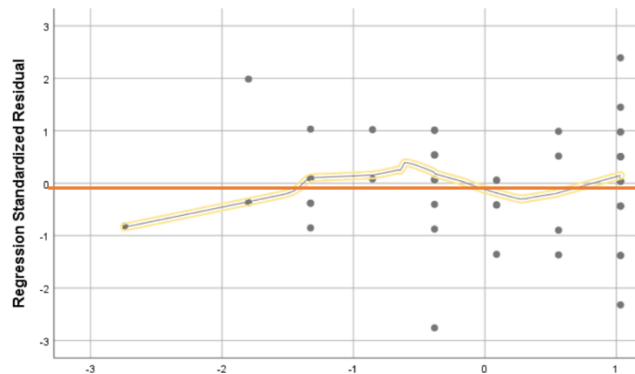

Fig. 6. Losses curve of standardized residual values vs. standardized predicted values (SPSS 25)

A uniform distribution of the scatter plot of standardized residual values vs. standardized predicted values free from a cone or a fan shape distribution confirmed the homoscedasticity of the data set as shown in Fig. 5.

Loess curve which propagated close to zero line without showing major deviations confirmed the linearity of the residual values as shown in Fig. 6.

The Durbin Watson value computed by SPSS 25 was 1.71 which falls between 1.5 and 2.5 and confirms that the residuals are independent or do not have autocorrelation. Since the error term or the residual in the regression model of mediator variable Vs. six independent variables satisfy the said four assumptions, the regression model is considered valid.

Linear regression of dependent variable Vs. mediator variable computed by SPSS 25 indicated the value of significance as 0.065 which is less than 0.05 (α >0.05). This determined the existence of null hypotheses that reveals the probabilities of respondents' rated observations are not statistically significant to reject the null hypotheses. Thus, the impact of customer satisfaction on revenue collection is not

significant. However, as per Hulin et al. as cited by Ursachi et al. [32] Cronbach's Alpha computed by SPSS 25 for every six scales used to constitute customer satisfaction and revenue collection variables were 0.795 and 0.532 respectively which indicates that six scales of revenue collection are marginally below the minimum reliability value of 0.6. The test results further indicate that the reliability level reaches above the marginal level by removing two scales of revenue collection, out of six. This reveals that before applying for mediating effect using Sobel test, the redundant two scales shall be modified and another pilot test must be carried out before starting a comprehensive research study.

10. CONCLUSION

The pilot test has validated six service quality dimensions (independent variables), customer satisfaction (mediator variable) for parametric analysis. By removing two redundant scales used to constitute revenue collection (dependent variable), the reliability level could be increased. Since data reduction may weaken the quality of the study, carrying out another pilot test by modifying two scales would be advisable. Taking the absolute value of Z-scores less than 1.96 for skewness and kurtosis of all said variables have confirmed the probability distribution of variables was substantially normal. The residual analysis of four assumptions of normality, homogeneity of variance, linearity, and independence confirmed the validity of all said variables were compatible for linear regression. The findings of the multiple linear regression of the mediator variable vs six independent variables indicate that two independent variables namely "assurance" and "accessibility" make a significant impact on customer satisfaction. The findings further interpret that though, there exists an impact from the rest of the four variables "reliability", "tangibility", "empathy" and "responsiveness" on customer satisfaction which is not statistically significant. This implies that the primary observations used for the statistical analysis are not adequate to reject the null hypotheses of four respective variables. In a small sample of a pilot study, each element possesses a higher weight. Therefore, the findings of this pilot study with a sample size of 48 would not be very similar to the findings of the anticipated comprehensive study. Before testing the mediator effect, Cronbach's Alpha indicated that two scales established to constitute revenue collection must be modified. Subject to such modifications, this pilot study confirms: (i) the appropriateness of the

questionnaire for a comprehensive research study; (ii) feasibility of the analytical process for a parametric analysis; (iii) feasibility for regression analysis of independent variables Vs mediator variable and dependent variable Vs mediator variable; and (iv) feasibility for assessing the impact of six service quality dimensions and revenue collection.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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