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Cogent Business & Management

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Suggested Citation: Shetty, Dasharathraj K et al. (2022) : A study of service quality in Indian public sector banks using modified SERVQUAL model, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-17, <https://doi.org/10.1080/23311975.2022.2152539>

This Version is available at:

<https://hdl.handle.net/10419/289391>

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To cite this article: Dasharathraj K Shetty, Nikhil Perule, Srinivasa Rao Potti, Maulik Jain, Namesh Malarout, Sonal Devesh, Sonia F Vaz, Babita Singla & Nithesh Naik (2022) A study of service quality in Indian public sector banks using modified SERVQUAL model, Cogent Business & Management, 9:1, 2152539, DOI: [10.1080/23311975.2022.2152539](https://doi.org/10.1080/23311975.2022.2152539)

To link to this article: <https://doi.org/10.1080/23311975.2022.2152539>



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Received: 03 August 2021
Accepted: 23 November 2022

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Reviewing editor:
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BANKING & FINANCE | RESEARCH ARTICLE

A study of service quality in Indian public sector banks using modified SERVQUAL model

Dasharathraj K Shetty¹, Nikhil Perule³, Srinivasa Rao Potti^{2*}, Maulik Jain⁴, Namesh Malarout², Sonal Devesh⁵, Sonia F Vaz⁶, Babita Singla⁷ and Nithesh Naik⁸

Abstract: Assessment of service quality has been widely utilized in the service sector, especially in the banking industry. The present study aims to understand the influence of service quality on customer loyalty in Indian public sector banks. The service quality is quantified with the help of a modified SERVQUAL model using dimensions Reliability, Assurance, Tangibles, Empathy, Responsiveness, Charges, and Convenience. Structural equation modelling (SEM) indicated that among all the dimensions, Assurance, Empathy, Responsiveness, and Tangible were found to have a significant relationship with service quality. The banks must focus on bringing in innovation in these parameters to maintain a high quality of service and achieve higher satisfaction, which subsequently develops customer trust towards the company. By bringing innovative changes to improve the service quality, the banks can also increase their competitive advantage and customer retention as service quality has a significant relationship with customer loyalty.

Subjects: Banking; Strategic Management; Management Education; Management of Technology & Innovation; Marketing; Marketing Research; Consumer Behaviour

Keywords: Banking; public sector banks; service quality; structural equation modelling; SERVQUAL

1. Introduction

The services industry is the leading industry in India's GDP, and attracts enormous Foreign Direct Investment (FDI) with an inflow of US\$ 83.14 billion between April 2000 and June 2020 and has provided large-scale jobs (International Labour Organization, 2021; Services Sector in India, 2021). India's service sector comprises a wide variety of operations including finance, hospitality, logistics, storage and communication, banking, insurance, real estate, business consultancy services, social and personal amenities, and construction services (Services Sector in India, 2021). In India, 32% of the total employment is generated from the services sector (International Labour Organization, 2021). Three competitive goals were found in India's services sector: quality/delivery, flexibility, and cost, with the highest being quality/delivery (Idris & Naqshbandi, 2019).

Service quality is an important means of gaining a strategic edge in an increasingly competitive environment, where consumers demand higher quality while selecting service providers (Parasuraman et al., 1985). Services seem to be subjective entities with behavior rather than actual objects whereas quality is a consumer's perception of the magnitude to which the good or service provided satisfies the expectations set. Understanding of service quality has been better explained by defining "service" and "quality" individually (Kiran & Singh, 2016). SERVQUAL is one of the methods for assessing and managing service quality (Buttle, 1996). It is also suggested that the model is used from the customer's perspective to assess service quality (Asubonteng et al.,

1996). SERVQUAL's primary focus is to provide a reliable and effective instrument that can be used to assess service quality in specific service sectors (Parasuraman et al., 1988). Originally, 10 dimensions of service quality were introduced, namely Security, Competency, Access, Reliability, Courtesy, Communication, Credibility, Tangibility, Responsiveness, and Understanding the customer, and were subsequently reduced to five dimensions, "Empathy", "Reliability", "Assurance", "Responsiveness", and "Tangibility" (Parasuraman et al., 1988).

Like any other service industry, the growth and development of the banking industry also depend on the quality of service they provide to their customers. Indian banking sector comprises 20 public-sector banks, 22 private-sector banks, 44 foreign banks, 44 regional rural banks, 1,542 urban cooperative banks, and 94,384 rural cooperative banks. As of March 2020, public-sector banks have approximately 92,708 offices across the country. Total banking sector assets in India stood at US\$ 1,350.29, of which US\$ 1,038.76 billion was contributed by public sector banks in FY19 (India Brand Equity Foundation, 2021). As the major market share of the banking sector lies with the public sector banks, it is important to identify the lack of quality of service provided by them and improve it for better customer retention.

2. Literature review and hypothesis development

The parameters considered in the SERVQUAL model are used to measure the service quality in the services industry in multiple sectors, such as the healthcare sector, the airline sector, the education sector, the food and hospitality sector, the transport and logistics sector, government, and the public sector along with the banking sector (Perule et al., 2020). In the healthcare industry, tangibility was found to be the most significant dimension in the context of developed and developing countries (Fatima et al., 2019). A similar Indian study showed the high importance of "tangibility" and "empathy" dimensions (Dar et al., 2018). "Empathy" and "assurance" were found to be strongly related to customer satisfaction through field testing at a hospital in Turkey (Kitapci et al., 2014).

The customers of a Turkish airline company rated "responsiveness" higher than "Tangibility", "Reliability" and "Assurance", "Flight Patterns", "Availability", "Image" and "Empathy" (Pakdil & Aydın, 2007). SERVQUAL model was also found to be used to examine the quality of sub-services of Airline like the efficiency of flight attendants (Salmani Mojaveri et al., 2019) and baggage handling system (Rezaei et al., 2018).

The major cause of low-quality educational services in Iranian technical and vocational colleges was found due to lacking perceptions in the "responsiveness" and "assurance" dimensions (Akhlaghi et al., 2012). "Responsiveness" and "Assurance" also proved to be important in a study based on postgraduate students of Brazil (Araújo et al., 2016). Whereas, a study of the hospitality sector in South Africa showed that the "reliability" dimension was the major cause of dissatisfaction among customers (Akilimalissiga et al., 2017). The quality of service provided by the logistics sector was majorly dependent on "assurance", "reliability", and "responsiveness" dimensions (Knop, 2019; Sam et al., 2018). The service cost was also an important factor deciding the satisfaction of the customer (Limsomkiat & Vanichchinchai, 2019).

Banking in the Serbian context saw the highest consumer expectation from the "assurance" dimension and the highest quality gap for "reliability" (Kakuoris & Finos, 2016). A study stated that using technology significantly improves customer satisfaction (Ahmed et al., 2017). A UAE-based study used "convenience" as an additional SERVQUAL dimension which resulted to be highly significant for customers of Islamic banks and Domestic banks (Kumar et al., 2018).

2.1. Service quality and customer loyalty

A Pakistan-based study on Islamic banks, found a significant effect of service quality dimension on customer satisfaction along with customer loyalty using a modified SERVQUAL model (Abd Ghani et al., 2017). Research in automotive repair garages in Canada showed that customer loyalty is

significantly influenced by service quality, trust, and reputation. Out of the mentioned factors, service quality had the highest path coefficient (Randhawa & Shaw, 2019). SERVQUAL model was used to measure the impact of service quality on customer loyalty among the banking customers of Riyadh, findings suggest that enhancing service quality will further increase customer loyalty. In the steadily increasing rivalry between banks service quality is highly critical and boosting service quality can directly increase customer loyalty (Albarq, 2013). A Canadian banking-based study shows that the SERVQUAL dimensions used to measure service quality are highly correlated with customer loyalty (Ladhari, 2009). A significant correlation between service quality and customer loyalty was observed in the Indian context. The dimensions of service quality specifically needed improvement to enhance customer loyalty (Vasumathi & Subashini, 2015).

2.2. Factors affecting service quality

According to the SERVQUAL model, “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” were the factors used in the multiple-item scale for measuring service quality (Parasuraman et al., 1988).

SERVQUAL model was used to approximate the quality of service and customer satisfaction in Malaysia and “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” were relevant factors affecting service quality (Mey et al., 2006). The Airlines industry showed the dependency of service quality on “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” with “Reliability” as the most important factor followed by “Responsiveness” and “Empathy” being the least (Rezaei et al., 2018). “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” have significant weights in evaluating educational service quality, thus verifying the use of the SERVQUAL model in educational institutions (Akhlaghi et al., 2012). For comparing service quality of private and public sector hospitals of Saudi Arabia, the dimensions of the SERVQUAL model were verified and high dependence of service quality on “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” was found (Alumran et al., 2020).

2.3. Additional factors

“Convenience” was found to be a critical factor apart from “Empathy, Reliability, Assurance, Responsiveness, and Tangibility” to understand and measure the service quality of Islamic, conventional, domestic, and foreign banks of UAE (Kumar et al., 2018). For understanding the effect of service quality on customer’s purchase intentions, “Behavior, Reliability, Tangible and Convenience” were used to compute service quality. In an Indian Multinational banking scenario, “Convenience” was found to be a critical parameter of service quality for the young as well as the older section of the population (Khare, 2011). “Convenience” was noticed as a relatively significant element in determining the service quality of Pakistan’s conventional and Islamic banks (Muhammad Awan et al., 2011). In a Goa-based study of Public and Private sector banks, “Value-Added Service”, “Responsiveness”, “Accessibility”, “Services Assured”, “Bank Charges”, and “Convenience” were found as the critical factor from the customers derive satisfaction. It was also found that the consumers of Private banks give more importance to “Convenience” when compared to their counterparts of Public sector banks (Dsouza et al., 2018). Service quality in a Hospital-based study in Thailand was defined using “reliability, tangible, response, cost, and empathy”, and they had direct causal implications (Untachai, 2013). SERVQUAL model was modified to add “Service cost” as an additional dimension. “Service cost” proved to be the key logistics service quality dimension for shippers (Limsomkiat & Vanichchinchai, 2019). From the findings of researchers on service quality, we can establish a relation between various factors that influence service quality.

2.4. Research framework

The factors influencing service quality, their meaning, and their contributing researchers are shown in Table 1.

Table 1. Factors influencing service quality

S. No.	Dimension	Meaning	References
1.	Reliability	Ability to perform the service offered with consistency and validity (Parasuraman et al., 1988).	
2.	Responsiveness	Willing to support consumers and provide timely service (Parasuraman et al., 1988).	
3.	Assurance	Employee knowledge, courtesy, and willingness to express honesty and confidence (Parasuraman et al., 1988).	(Rezaei et al., 2018, Akhlaghi et al., 2012, Mey et al., 2006, Alumran et al., 2020).
4.	Tangibles	Physical infrastructure design, equipment staff, and resources for contact (Parasuraman et al., 1988).	
5.	Empathy	The organization provides its clients with thoughtful, personalized service (Parasuraman et al., 1988).	
6.	Convenience	Ease in the accessibility of banking services by its customers.	(Kumar et al., 2018, Khare, 2011, Muhammad Awan et al., 2011, Dsouza et al., 2018, Choudhury, 2013).
7.	Charges	Charges/costs incurred in regular banking by its customers.	(Limsomkiat & Vanichchinchai, 2019, Dsouza et al., 2018, Untachai, 2013).

Hypothesis 1 (H1): Assurance significantly influences the Service Quality in Indian Public sector banks.

Hypothesis 2 (H2): Charges significantly influences Service Quality in Indian Public sector banks.

Hypothesis 3 (H3): Convenience significantly influences the Service Quality in Indian Public sector banks.

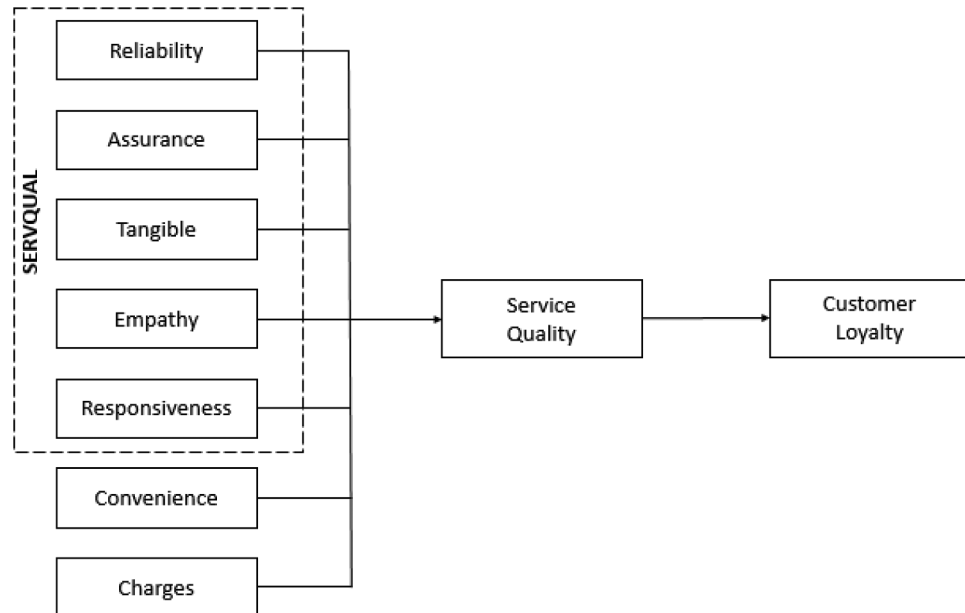
Hypothesis 4 (H4): Empathy significantly influences Service Quality in Indian Public sector banks.

Hypothesis 5 (H5): Reliability significantly influences the Service Quality in Indian Public sector banks.

Hypothesis 6 (H6): Responsiveness significantly influences the Service Quality in Indian Public sector banks.

Hypothesis 7 (H7): Tangibles significantly influence the Service Quality in Indian Public sector banks.

Figure 1. Conceptual model.



Hypothesis 8 (H8): Service Quality significantly influences Customer Loyalty in Indian Public sector banks.

The conceptual framework of the study is illustrated in Figure 1.

3. Research methodology

3.1. Development of the questionnaire

A self-administered questionnaire based on the SERVQUAL model was employed for the present study. The questionnaire comprised of two sections: the initial portion was designed to obtain the respondents' demographic details (gender, age, education qualification, marital status, family annual income, and geographic location), and the second section comprised of the developed questionnaire. A 5-point Likert scale was used, where 5 stood for "Strongly Agree", and 1 stood for "Strongly disagree". The questionnaire comprised 37 items for the final survey.

3.2. Data collection and measurement

As the present study attempts to assess the service quality of Public Sector banks in India, primary data was collected from the active customers of public sectors banks based in India. Google forms were circulated for the collection of data where each respondent was strictly restricted to one response. Incentives were provided in exchange for their responses. A pilot survey was carried out for 66 respondents. Based on a factor analysis, all the items were retained for the final survey. The final survey was carried out for 1329 respondents. A convenient sampling technique was used to collect data from the respondents and the descriptive statistics for the same were generated using Microsoft Excel. The response collected from the survey was analyzed using the Structural Equation Modelling (SEM) technique leveraging the SmartPLS 3 tool for data analysis.

3.3. Sample description

Demographic details of the respondents were tabulated using Microsoft Excel. The descriptive statistics of the respondents of the present study are shown in Table 2. The survey received responses from 1329 respondents who are customers from various public sector banks across India. Out of the total respondents, 62.3% were male individuals and 37.10% were female

Table 2. Descriptive statistics of respondents

Dimension	Category	Frequency	%
Gender	Male	828	62.30%
	Female	493	37.10%
	Prefer not to say	8	0.60%
	Total	1329	100.00%
Age	Less than 25 years	309	23.25%
	25–35 years	480	36.12%
	35–45 years	316	23.78%
	45–55 years	172	12.94%
	above 55 years	52	3.91%
	Total	1329	100.00%
Educational Qualification	Senior Secondary School	55	4.14%
	Diploma	19	1.43%
	Graduation	286	21.52%
	Post-Graduation	657	49.44%
	Doctoral Degree	312	23.48%
Marital Status	Total	1329	100.00%
	Married	666	50.11%
	Unmarried	647	48.68%
	Divorced	9	0.68%
	Widowed	7	0.53%
Annual Income	Total	1329	100.00%
	Less than 5,00,000	931	70.05%
	5,00,000–25,00,000	343	25.81%
	25,00,000–50,00,000	38	2.86%
	Greater than 50,00,000	17	1.28%
Total		1329	100.00%

individuals. Participants varied across different age groups. 23.25% were aged below 25 years, 36.12% were in the age group of 25–35 years, 23.78% were in the age group 35–45 years, 12.94% were between the ages 45 to 55 years, and 3.91% were aged above 55 years. About 4% of the respondents have educational qualifications of senior secondary school, only about 1% were diploma holders, about 21% were graduates, over 49% were post-graduates, and about 23% held doctorate degrees. About 50% of the respondents were married, about 48% were unmarried, 0.68% were divorced, and 0.53% of respondents were widowed. The income distribution of the participants is as follows—70.05% of the participants earned less than 5 Lakh Rupees annually, 25.81% earned between 5 and 25 Lakh Rupees, about 3% earned between 25 lakh—50 lakh rupees, and about 1% of the participants earned more than 50 Lakh Rupees a year.

4. Results and discussion

The data obtained from the final survey is evaluated in two phases. For the first phase, validity and reliability test, and factor analysis are carried out. A conceptual model was designed with dimensions from the SERVQUAL model such as “Responsiveness, Assurance, Tangibles, Empathy, Reliability” and additional factors such as “Convenience” and “Charges”. The variables were identified based on a comprehensive literature review. Factor analysis was carried out to reduce the number of items for the final survey. However, all the items were accepted based on analysis. In the second phase of evaluation, path analysis and hypothesis testing are performed using Smart PLS.

The Factor Analysis, Validity and Reliability statistics, and Discriminant Validity are presented in Tables 3–5 respectively. Based on an extensive literature review, dimensions were added to the existing SERVQUAL model. The present study attempts to test the influence of these dimensions on the service quality of Public Sector Banks in India. The study also attempts to test the influence of service quality on customer loyalty of Public Sector Banks in India.

4.1. Factor analysis

Table 3 shows the factor loadings of the items used in the present study. To test the relationship between the different dimensions of service quality and customer loyalty, factors were identified and added to the SERVQUAL model and used as a measure of service quality. As a result, factor analysis was carried of the data collected. According to (Hair et al., 2019), factor analysis is a data reduction technique used to reduce a large number of variables into a few factors. Table 3 shows factor analysis performed to examine the sample adequacy and influence and relationships of the factors used in the study. According to (Hair et al., 2019), items with factor loadings above 0.7 can be considered acceptable for the study. As shown in Table 3, all the factor loading is above 0.7 in value. Therefore, all the items have significant factors loadings.

4.2. Validity and reliability statistics

Validity and reliability tests were carried out to check the consistency with which the instrument gives similar results. The internal consistency indicator (Cronbach's alpha) is used to estimate the reliability of the statement in each construct. Cronbach's alpha is a coefficient of internal consistency. It generally increases with the increase in intercorrelations among the statements to be tested and therefore, it is known as an internal consistency estimate of the reliability of test scores. Its value varies from 0 to 1. Composite Reliability is another indicator of internal consistency, that is more adequate than Cronbach's Alpha as the measure of composite reliability does not tend to rise in value on the addition of new items (Hair et al., 2019). According to (Hair et al., 2019), the composite reliability and Cronbach's Alpha for all the constructs should be greater than 0.7. It can be noted that all the dimensions have Cronbach's alpha values and composite reliability values more than 0.7 as provided in Table 4, which confirms the construct reliability. The average variance extracted (AVE) > 0.5 confirms convergence validity (Hair et al., 2019). The average variance extracted (AVE) of constructs was higher than 0.5 the suggested value except for one of them, but the majority of them have 0.50. It means more than half of the variances in constructs are explained by their corresponding measures.

The discriminant validity is a comparison between the square root of the AVE and other latent variables, which can be assessed using the Fronell-Lacker criterion (Hair et al., 2019). The square root of the AVE was compared with the correlation between the constructs and other constructs. Table 5 shows acceptable discriminant validity between the constructs.

4.3. Structural model assessment

The structural model specifies the relations between constructs allowing testing the hypotheses of the study. Figure 2 shows the path coefficient for the direct relationship between the dimensions of service quality and customer loyalty.

The path model shows the positive relationship between the dependent and independent variables in the path model. Hair et al. (2019) state that the threshold values of 0.25, 0.50 and 0.75 for endogenous constructs are considered to be “weak”, “moderate”, and “substantial”, respectively. Therefore, the R^2 values obtained in the present study can be considered substantial. Based on the values obtained, the independent variables selected for the present study such as Charges, Empathy, Convenience, Tangibles, Assurance, Reliability, and Responsiveness, explain 84% of the dependent variable, Service Quality. About 60% of the dependent variable, Customer Loyalty is explained by Service Quality.

Table 3. Factor analysis

	Assurance	Charges	Convenience	Customer Loyalty	Empathy	Reliability	Responsiveness	Service Quality	Tangibles
ASRE1	0.896								
ASRE2	0.888								
ASRE3	0.892								
ASRE4	0.885								
CRGP1		0.9							
CRGP2		0.909							
CRGP3		0.907							
COMP4			0.854						
COMP1			0.859						
COMP2			0.824						
COMP3			0.87						
CULP1				0.907					
CULP2				0.933					
CULP3				0.923					
EPTP1					0.901				
EPTP2					0.906				
EPTP3					0.898				
EPTP4					0.901				
EPTP5					0.836				
REL1						0.895			
REL2						0.873			
REL3						0.886			
REL4						0.892			
REL5						0.859			

(Continued)

Table 3. (Continued)

	Assurance	Charges	Convenience	Customer Loyalty	Empathy	Reliability	Responsiveness	Service Quality	Tangibles
RESP1							0.882		
RESP2							0.907		
RESP3							0.912		
RESP4							0.912		
SQ1								0.892	
SQ2								0.874	
SQ3								0.9	
SQ4								0.895	
TAN2									0.608
TANP1									0.87
TANP2									0.881
TANP3									0.859
TANP4									0.878

Table 4. Validity and reliability statistics

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Assurance	0.913	0.913	0.939	0.793
Charges	0.89	0.892	0.932	0.82
Convenience	0.874	0.874	0.913	0.725
Customer Loyalty	0.911	0.911	0.944	0.849
Empathy	0.933	0.934	0.949	0.79
Reliability	0.928	0.928	0.946	0.776
Responsiveness	0.925	0.926	0.947	0.816
Service Quality	0.913	0.914	0.939	0.792
Tangibles	0.879	0.9	0.913	0.682

4.4. T- statistics

The T statistics or T-test is a method to test if results differ substantially at a specified P-value. It is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related to certain features. A large t-score indicates that the compared groups are different whereas, smaller t scores denote that the compared groups are similar.

Figure 3 shows the results of t-statistics analyzed by bootstrapping the data in the SmartPLS Version 3 to test the hypothesis. Table 6 shows the P-values and t-statistics to test the hypotheses postulated.

4.5. Hypothesis testing

The present study identified factors influencing Service Quality based on an extensive literature review. The objective of this study is to test the impact of these dimensions on the Service Quality of Public sector banks in India. This study also attempts to evaluate the impact of Service Quality on Customer Loyalty in Indian Public sector banks.

The path coefficient between the variables assurance and service Quality is significant at 0.01 level ($t = 6.292$ significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that assurance has a significant impact on service quality has been accepted. The path coefficient between the variables Charges and Service Quality is significant at 0.01 level ($t = 0.929$ not significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that charges have a significant impact on service quality has not been accepted. The path coefficient between the variables Convenience and Service Quality is significant at 0.01 level ($t = 0.137$ not significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that convenience has a significant impact on Service Quality has not been accepted.

The path coefficient between the variables Empathy and Service Quality is significant at 0.01 level ($t = 8.659$ significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that Empathy has a significant impact on Service Quality has been accepted. The path coefficient between the variables

Reliability and Service Quality is significant at 0.01 level ($t = 1.33$ is not significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that Reliability has a significant impact on Service Quality has not been accepted. The path coefficient between the Responsiveness and Service Quality is significant at 0.01 level ($t = 7.978$ significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that Responsiveness has a significant impact on Service Quality has been accepted.

Table 5. Discriminant validity

	Assurance	Charges	Convenience	Customer Loyalty	Empathy	Reliability	Responsiveness	Service Quality	Tangibles
Assurance	0.891								
Charges	0.347	0.906							
Convenience	0.41	0.832	0.852						
Customer Loyalty	0.471	0.768	0.759	0.921					
Empathy	0.473	0.784	0.823	0.78	0.889				
Reliability	0.552	0.717	0.773	0.751	0.819	0.881			
Responsiveness	0.478	0.737	0.774	0.755	0.862	0.871	0.904		
Service Quality	0.556	0.727	0.765	0.774	0.873	0.834	0.878	0.89	
Tangibles	0.564	0.71	0.756	0.724	0.795	0.843	0.798	0.799	0.826

Figure 2. Structured path model.

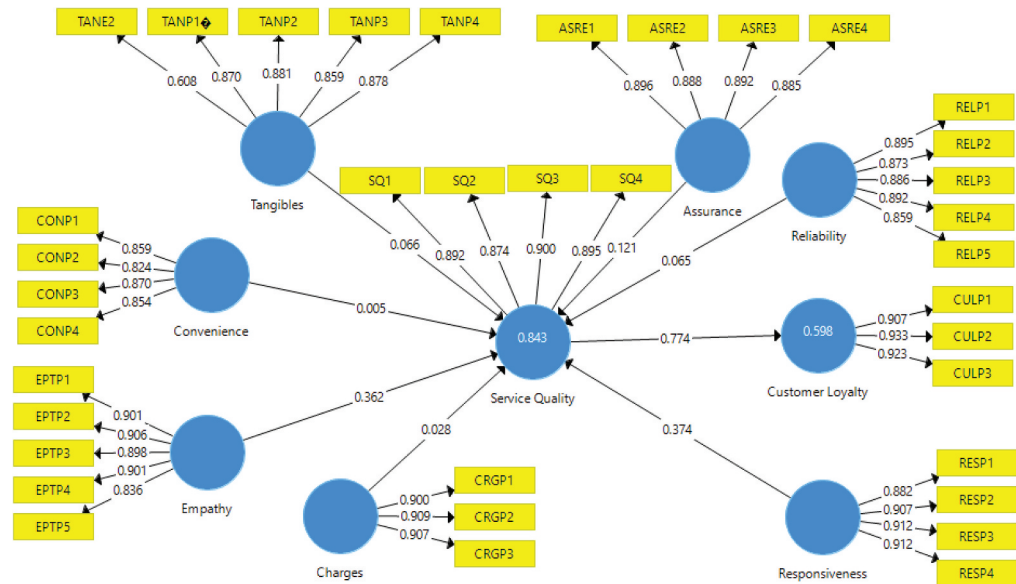
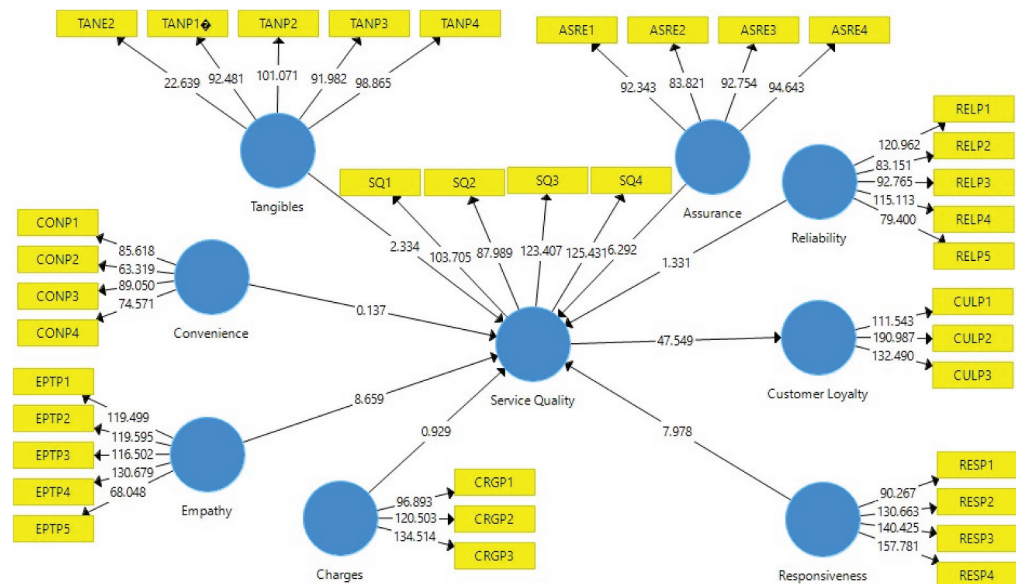


Figure 3. T statistics.



The path coefficient between the Service Quality and Customer Loyalty is significant at 0.01 level ($t = 47.549$ significant at 0.01 level; Hair et al., 2019). Hence, the hypothesis that Service Quality has a significant impact on Customer Loyalty has been accepted. The path coefficient between the Tangibles and Service Quality is significant at 0.01 level ($t = 2.33$ significant at 0.05 level; Hair et al., 2019). Hence, the hypothesis that Tangibles have a significant impact on Service Quality has been accepted.

The results show the impact of influencing factors on service quality and customer loyalty. The path model and t-statistics, in Figures 2 and 3 respectively, show that the independent variables charges, convenience, empathy, assurance, service quality, responsibility, and tangibles are the impacting factors affecting the dependent variable service quality. A significant impact of service quality on customer loyalty has also been observed. Table 6 shows path coefficients, t statistics,

Table 6. Hypotheses testing

		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Support
H1	Assurance -> Service Quality	0.121	0.121	0.019	6.292	0	Supported
H2	Charges -> Service Quality	0.028	0.028	0.03	0.929	0.353	Not supported
H3	Convenience-> Service Quality	0.005	0.005	0.035	0.137	0.891	Not supported
H4	Empathy -> Service Quality	0.362	0.361	0.042	8.659	0	Supported
H5	Reliability -> Service Quality	0.065	0.069	0.049	1.331	0.184	Not supported
H6	Responsiveness -> Service Quality	0.374	0.374	0.047	7.978	0	Supported
H7	Service Quality -> Customer Loyalty	0.774	0.774	0.016	47.549	0	Supported
H8	Tangibles -> Service Quality	0.066	0.064	0.028	2.334	0.02	Supported

and p-values for the analysis. The results of the present study concluded that the independent factors responsiveness, assurance, empathy, and tangibles have a significant impact on the service quality of public sector Banks in India. Service Quality also shows a high impact on the customer loyalty of public sector Banks in India.

As the findings of the present study suggest that Assurance, Empathy, Responsiveness, and Tangibles significantly impact the Service Quality of public sector banks in India, these financial institutions must devise various methods to improve the banking processes to be more responsive and empathetic towards their customers. They must focus on the improvement of these dimensions as it has been observed that service quality also has a significant positive impact on customer loyalty.

5. Conclusion

Researcher scholars and experts believe that customer retention in firms and companies is of the utmost importance if they want to remain in business, and it comes only through maintaining customer loyalty and customer satisfaction. Firstly, it is a well-known fact that measuring tangible products is much more straightforward than measuring intangible services. Additionally, intangible concepts like customer loyalty and customer satisfaction must be redefined constantly in an ever-changing economic landscape.

The results of the study showed that the new dimensions “Assurance”, “Empathy”, “Responsiveness”, “Tangibles” have a significant impact on “Service quality”. In addition, a significant relationship between “Service quality” and “Customer loyalty” is observed. Customers prefer a bank and stay loyal to them because of the trustworthy behavior, sense of assurance while making a transaction; the individual attention is given to them at the bank and a clear understanding that the bank has the best interest of the customer. Prompt response, willingness to help the customer, and suitable operating hours of the bank hold significant importance in measuring the service quality. The use of visually appealing modern appliances, ease of using self-service options is among other factors that enhance the banking experience for the customer. The modified SERVQUAL model proved to be an effective tool for gauging the relevant factors for measuring service quality with a substantial R^2 value (0.843). Indian public sector banks must try to bring innovation in the abovementioned parameters to improve the overall banking experience. These innovations can be brought majorly in the self-service provisions, the faster response rate to customer queries using artificial intelligence, and implementing intelligent machines in the bank.

6. Limitations and future recommendations

The research is subject to numerous limitations. This study only utilized the traditional five factors of the SERVQUAL tool along with two additional factors, namely tangibles, reliability, responsiveness, assurance, empathy, convenience, and charges. There are still other factors and tools that can be considered using in this type of study, thus limiting the findings of this study. Future researchers can explore these factors using other applicable models. Further, the impact of ongoing technological innovations in the banking sector can also be studied to understand their impact on service quality. As the study focuses only on public sector banks in India, future studies can be conducted for the private sector and cooperative sector banks in India and other developing countries.

Funding

This research received no external funding.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Data Availability Statement

Data are available and can be provided on request.

Author contributions

Conceptualization, D.R.S., N.P., S.D., N.N.; methodology, N. P., P.S.R., M.J., N.N.; formal analysis and investigation: N.P., P.S.R., M.J., N.N.; writing—original draft preparation: N.P., M.J., N.N., B.S.; project administration and supervision: D.R. S., S.D., N.N.; writing—review and editing: D.R.S., S.F.V., B.S., N.N. All authors have read and agreed to the published version of the manuscript.

Citation information

Cite this article as: A study of service quality in Indian public sector banks using modified SERVQUAL model, Dasharathraj K Shetty, Nikhil Perule, Srinivasa Rao Potti, Maulik Jain, Namesh Malarout, Sonal Devesh, Sonia F Vaz, Bobita Singla & Nithesh Naik, *Cogent Business & Management* (2022), 9: 2152539.

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