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Application of the SERVQUAL Model to evaluate the service quality of Arunachal Pradesh State Transport Service

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ABSTRACT

This study aims to evaluate the service quality of the Arunachal Pradesh State Transport Service (APSTS) based on passengers' perceptions and expectations using the SERVQUAL model. A survey of 385 respondents was conducted using a modified SERVQUAL questionnaire to assess their service perception and expectations. Reliability tests, construct validity tests, and Exploratory Factor Analysis (EFA) were performed using IBM SPSS to establish the reliability and validity of the SERVQUAL measurement scale. The analysis of passengers' responses revealed that the perceived service quality of passengers is alarmingly low, and a negative quality gap exists in all five service quality dimensions. The quality gaps in each dimension are as follows: Tangibles (-2.35), Reliability (-0.86), Responsiveness (-1.84), Assurance (- 1.20), and Empathy (-1.96). It indicates that passengers of APSTS are not satisfied with its services and expect more than what they receive from APSTS in all five dimensions of the SERVQUAL model. These findings suggest that the management of APSTS should revise the service quality criteria for each dimension and prioritise the dimensions with the highest quality gap (i.e., tangibles, empathy, and responsiveness) to improve its service quality.

Keywords: Arunachal Pradesh State Transport Services, Customer Satisfaction, Passengers, Expectations, Perception, Service Quality, and SERVQUAL Model.

1. INTRODUCTION

A well-developed public transport system catalyses a country's overall socioeconomic development. Today, public transport is a distinctive feature of modern civilisation. It not only facilitates the movement of people but also plays a crucial role in transporting goods and input resources, contributing to the country's all-round economic development. In Arunachal Pradesh, however, the development of public transport systems started very late due to the hilly and mountainous region. Even after seven decades of the country's independence, other advanced modes of transport, such as railways and airways, are not fully developed. Therefore, to meet the mobility requirements of the people in the state, the Government of Arunachal Pradesh started Arunachal Pradesh State Transport Services (APSTS) with two buses in 1975. Since then, the APSTS has played a vital role in the state's overall development by offering essential public transport services to different parts of the state, including remote rural areas. Moreover, the APSTS has been instrumental in promoting tourism by providing reliable transportation options for tourists to explore the state's scenic beauty and cultural heritage. However, over the past few years, the APSTS has been censured because of its deteriorating service quality and its substantial

financial losses due to cut-throat competition from private transport operators. The public transport industry has become more competitive in the state due to the emergence of several private operators. As a result, passengers' preferences and mobility requirements have changed rapidly over time. Therefore, the APSTS must deliver higher quality service to become competitive in such a fiercely competitive environment. The management needs to enhance its service quality and improve financial viability by developing a sound policy framework, which requires a comprehensive study of its service quality. Hence, this study provides valuable insights to policymakers for reviewing existing service performance and helping develop a refined service improvement plan for APSTS. Furthermore, this study would enrich the existing knowledge in the relevant field and serve as a reference point for scholars, academicians, and industry practitioners for future research.

This study aims to assess the service quality of the APSTS by analysing the gaps between passengers' expectations and perceptions, using the SERVQUAL framework developed by Parasuraman, Zeithaml, and Berry in 1988. The model examines five aspects of service quality (i.e., Reliability, Tangibles, Assurance, Empathy, and Responsiveness). The study is structured into five sections: Section Two reviews the existing literature, Section Three explains the research methodology, Section Four presents and discusses the results, and Section 5 summarises the findings.

2. REVIEW OF LITERATURE

This section overviews prior research concerning service quality, customer perceptions and expectations, customer satisfaction, and the SERVQUAL model.

2.1. Service Quality

Parasuraman, Zeithaml, and Berry (1988) defined service quality as the variance between customers' expectations and perceptions across five essential aspects of service (i.e., reliability, assurance, responsiveness, empathy, and tangibles. Parasuraman et al. (1990) refined their definition to encompass technical and functional quality of service, emphasising the significance of understanding and managing customer expectations to meet or exceed their expectations. Similarly, according to Cronin and Taylor (1992), service quality refers to customers' overall impression based on their perceptions of the service offered compared to their expectations. Grönroos (2000) explained service quality as the extent to which an organisation's services either meet or exceed the expectations of its customers. This underlines the crucial role of customer expectations in defining service quality. Furthermore, Bitner and Zeithaml (2003) conceptualise service quality as the degree to which customers perceive a service as fulfilling or surpassing their expectations. According to Zeithaml et al. (2012), service quality is unequivocally the customer's overall perception of the adequacy or inadequacy of the service offered.

2.2. Customer Perceptions and Expectations

Customers' perceptions of service delivery and expectations are two essential concepts used in the SERVQUAL framework to assess service quality. The model evaluates the service quality gap by comparing customer perceptions with their expectations. Several authors attempted to define the terms perception and expectation. Perception can be defined as a cognitive process of organising, and interpreting sensory data. Stephen P. Robbins defined perception as "the process by which individuals organise and interpret their sensory impressions to make sense of their environment." Goffman, E. (1959) defines perception as the interpretation of social cues by individuals and the execution of roles according to their comprehension of social norms and expectations. Allport, G. (1961) describe perception as the process by which individuals select, organise, and interpret sensory information to construct a coherent understanding of their environment. He underscored the role of cognitive processes in shaping our perception of the world. Neisser, U. (1976) regards perception as an active process influenced by cognitive schemas and expectations. He contends that perception is moulded by both sensory input and mental structures. Kant, I. (1781) described perception as the process by which the mind organises sensory inputs based on innate categories of understanding. According to him, perception entails active mental structuring rather than passive data reception. On the other hand, Nisbett, R.E. and Wilson, T.D. (1977) conceptualised expectation as a cognitive bias wherein individuals anticipate specific outcomes based on past knowledge or experience. They posited that these expectations impact perception and decision-making and frequently operate without conscious awareness. Mill, J.S. (1843) distinctly characterised expectation as a belief or assumption concerning future events derived from past experiences and inductive reasoning. Keynes, J.M. (1936) delineated expectation as individuals' anticipation of future economic conditions, thereby shaping their current decisions and behaviours in the market. Skinner, B.F. (1953) defined expectation as the anticipatory responses individuals form based on reinforcement patterns and past experiences. Hence, customers' expectations pertain to the anticipated and desired service level that customers expect from a service provider.

2.3. Customer Satisfaction

Customer satisfaction significantly influences loyalty, the business's reputation, and profitability. According to Anderson et al. (1993), a positive association exists between customer satisfaction, service quality, and profitability. Badlani et al. (2017) found that profit for any business will increase if customers are pleased with the quality of its products or services. In today's business landscape, customer satisfaction is crucial to

success. It is widely acknowledged that maintaining existing customers is more economical than acquiring new ones.

Many different models and taxonomies have been used to define customer satisfaction. According to Oliver (1997), customer satisfaction refers to "the customer's fulfilment." In the service industry, fulfilment can be assessed by comparing perceived and expected service quality. Any disparities between these two are due to inconsistencies between expected and perceived service quality. These disparities may be positive, negative, or zero. Positive disparities enhance or maintain customer satisfaction, whereas negative disparities result in dissatisfaction. According to Philip Kotler, satisfaction reflects an individual's pleasure or disappointment by comparing a product's performance and pre-existing expectations. Fornell (1992) defined customer satisfaction as the "difference between what customers expect and what they perceive." Moreover, another scholarly source posited that customer satisfaction is a psychological state arising from an affirmation or dissonance between prior expectations and actual product or service performance (Westbrook & Oliver, 1991).

In a nutshell, satisfaction can be understood as the fulfilment or gratification that occurs when an individual's desires, needs, or expectations are met effectively through a high-quality product, excellent service, memorable experience, or positive interaction. It is the degree to which a business or organisation meets or surpasses customers' expectations with its products or services. In the public road transport industry, customer satisfaction may be defined as the passengers' perceptions of the quality of service provided during their journey. This service quality encompasses aspects such as punctuality, safety, comfort, accessibility, cleanliness, staff behaviour, information provision, and the overall reliability of the service. In this study, the researcher measured passengers' satisfaction with the service quality of APSTS by contrasting their perceived service quality with their expectations. Perceived service quality is considered unsatisfactory if expectations exceed perception, leading to customer dissatisfaction and vice versa.

2.4. SERVQUAL model

Many researchers have used the SERVQUAL model to evaluate service quality and customer satisfaction in several industries. Kumar et al. (2010) implemented the SERVQUAL framework within the banking sector. The study revealed that reliability is the most influential dimension impacting customer satisfaction. Saleh and Ryan (2013) examined service quality within the hospitality industry by applying the SERVQUAL framework. The study elucidated the gap between the perceptions of hotel attributes held by clients and management and between client expectations and their perceptions of the services rendered. It was suggested that these gaps contribute to dissatisfaction with the services provided. Babakus and Boller (1992) applied the SERVQUAL model to assess service quality in the healthcare sector. Their study identified specific aspects of service quality, mainly empathy and assurance, that substantially influenced patient satisfaction. They suggested that healthcare providers should prioritise these dimensions to improve patient experiences. Furthermore, Al-Ababneh et al. (2017) research corroborated that patient perceptions of service quality, as evaluated through SERVQUAL, are directly associated with their satisfaction levels. Amin and Isa (2008) conducted a study that revealed a direct interrelation between perceived service quality, customer satisfaction, and loyalty within the telecommunications sector. Their findings underscore the significance of responsiveness and assurance in a fiercely competitive market where customer retention is pivotal in achieving success. Using the SERVQUAL model, Balamurugan and Gopi (2020) investigated the association between service quality indicators and daily commuters' satisfaction with public mass transportation in Tamil Nadu. The study revealed that all five service dimensions of mass public road transport in Tamil Nadu exhibited a negative quality gap between the perception of daily commuters and their expectations. The authors stressed that tangibles, assurance, and empathy significantly influence commuters' satisfaction. Marco Alberto et al. (2019) comprehensively evaluated the public transportation quality in Morelia, Mexico, using the SERVQUAL model. The study employed five distinct aspects of service quality (i.e., tangibles, reliability, responsiveness, security, and empathy) to evaluate the users' perceived service quality and expectations. The results showed a substantial quality discrepancy between the actual and expected services for every variable. Prasad and Kumar (2016) underscored the necessity of modifying the SERVQUAL dimensions to encompass elements such as safety and convenience, which are pertinent within the transportation sector.

3. RESEARCH METHODOLOGY

This section describes the methodology used for the study, including the research design, data collection methods, sampling techniques, and data analysis tools and techniques.

3.1. Research Design

This study utilised a qualitative research design to evaluate the service quality of the APSTS. The service quality gap was assessed based on passengers' perceptions and expectations using the SERVQUAL framework. The quality gaps were computed by subtracting the passengers' expectations from the perceived service quality.

Service Quality Gap = Avg. Expectation Score – Avg. Perception Score

Five dimensions of the SERVQUAL framework (i.e., Reliability, Responsiveness, Assurance, Tangible and Empathy) were considered to ascertain the service quality gap.

3.2. Sampling Technique

The study includes passengers of the APSTS who are 15 years and older. The sample size was determined using William H. Cochran's formula for determining sample size in the case of large or infinite populations, developed in 1977. The sample size for the present study was 385 passengers, consisting of 49.35% male and 50.64% female passengers. There was no accessible sampling frame, so the respondents were chosen using a convenience sampling technique.

3.3. Data Collection Method and Tools

The required data for this study was gathered through interviews using a modified SERVQUAL questionnaire designed after reviewing relevant literature and a pilot study involving APSTS passengers. The questionnaire comprises 26 measurement scales to assess passengers' perceptions and expectations of the APSTS's service quality. The questionnaire was administered on a five-point Likert scale to evaluate service quality across the five dimensions of the SERVQUAL model. Respondents indicated their opinion by selecting a point on the scale. The scoring system was defined as follows: 1 for strongly disagree, 2 for disagree, 3 for neither agree nor disagree, 4 for agree, and 5 for strongly agree. Furthermore, the data was collected from May to September 2023.

3.4. Tools and techniques of analysis

The data collected was edited, classified, and analysed using tables, MS Excel, and IBM SPSS statistics version 23. Descriptive statistics were computed to summarise the average scores for expectations and perceptions within five SERVQUAL dimensions. The gap scores were used to identify the areas that require improvement in service quality. The validity and reliability of the measurement tool were established using Exploratory Factor Analysis (EFA), Fornell-Larcker's criterion, the AVE criterion and Cronbach's Alpha.

3.5. Construct Validity and Reliability Test

The validity and reliability of the questionnaire were established through a pilot study of 100 passengers using Exploratory Factor Analysis (EFA), Fornell-Larcker's criterion, the AVE criterion and Cronbach's Alpha. The data related to validity and reliability were computed and analysed using IBM SPSS Statistics (version 23), and the results are exhibited in Tables 1.1 and 1.2. Convergent validity was assessed using Fornell-Larcker's criterion by calculating each factor's Average Variance Extracted (AVE). The AVE for each construct should be higher than 0.5 to establish convergent validity. The average variance extracted (AVE) was above the threshold of 0.5 for all five dimensions of the SERVQUAL questionnaire for perceptions and expectations, indicating good convergent validity. Furthermore, the test result shows that the Composite Reliability (CR) is higher than 0.7 in all five dimensions, suggesting that measurement scales consistently measure the underlying construct. Hence, items on the scale are reliable indicators of five latent constructs.

Fornell-Larcker criteria were employed to test the discriminant validity. According to Fornell-Larcker's criterion, the √AVE for all the latent constructs should exceed the correlation between that latent construct and other latent constructs to establish discriminant validity. The value of √AVE for perception and expectation was more significant than the correlation between that latent construct and other latent constructs. Hence, it can be concluded that each latent construct of the measurement instrument satisfied the criteria for good discriminant validity.

Table 1.1: Construct Validity Test

Dimensions	Items	Perception				Expectation			
		Factor loading	AVE	√AVE	CR	Factor loading	AVE	√AVE	CR
Tangibles	1 to 5	0.642 to 0.927	0.618	0.786	0.887	0.700 to 0.855	0.649	0.806	0.902
Reliability	6 to 11	0.603 to 0.881	0.610	0.781	0.920	0.597 to 0.941	0.640	0.779	0.925
Responsiveness	12 to 15	0.656 to 0.922	0.693	0.832	0.898	0.676 to 0.881	0.616	0.785	0.864
Assurance	16 to 20	0.709 to 0.862	0.634	0.796	0.896	0.618 to 0.871	0.608	0.780	0.834
Empathy	21 to 26	0.637 to 0.870	0.611	0.782	0.935	0.701 to 0.942	0.663	0.814	0.957
KMO		0.833				0.877			
Bartlett's Test of Sphericity (P-value)		0.000				0.000			

Exploratory Factor Analysis (EFA) was also performed to ascertain the factor loadings of each indicator. Each indicator or item should load high (ideally greater than 0.5) on their respective constructs to accurately measure the intended constructs. The EFA results are presented in Table 1.1. The results showed that Bartlett's Test of Sphericity produced a statistically significant result (P value < 0.05), confirming that the data are fit for factor analysis. The KMO (Kaiser-Meyer-Olkin) measure has exceeded the 0.70 threshold, signifying that the sample size is adequate for factor analysis. Furthermore, the Exploratory Factor Analysis revealed that the factor loadings of items related to the same latent construct were high (i.e., exceeding the 0.5 threshold). This suggests that the items effectively measure the intended constructs and demonstrate good convergent validity. Cross-loadings were also examined, and it was found that the indicators loaded highly on their intended constructs and low on other constructs.

The reliability of the measurement tool was ascertained using Cronbach's alpha. Abraham and Barker (2014) suggested that a Cronbach's Alpha value of 0.70 or higher is acceptable. In this study, the overall Cronbach's alpha is 0.935, and the dimension-wise Cronbach's alpha was above 0.70. Hence, the questionnaire used to elicit passengers' responses is considered highly reliable.

Table 1.2: Reliability Test

Dimensions	Items	Perception (Cronbach's Alpha)	Expectation (Cronbach's Alpha)
Tangibles	5	0.841	0.883
Reliability	6	0.837	0.893
Responsiveness	4	0.854	0.741
Assurance	5	0.858	0.820
Empathy	6	0.833	0.792
Overall	**26**	**0.951**	**0.935**

Source: The Author

3.6. Model

The SERVQUAL framework was employed to assess the service quality of APSTS. The model was developed by Parasuraman, Zeithaml and Berry in 1988. This model is based on the notion that service quality is ascertained by computing the gap between customers' expectations and their perceptions of the service offered. If the service quality gap is positive, it indicates that the service quality is satisfactory, and the passengers perceive higher quality than anticipated. If the gap is negative, it indicates unsatisfactory service quality and dissatisfaction among passengers. The service quality gap equal to 0 or closest to 0 represents the service meeting passengers' expectations. This model primarily considers five dimensions of service (i.e., Reliability, Assurance, Tangible, Empathy, and Responsiveness) to assess service quality and customer satisfaction. The modified SERVQUAL scale comprising 26 indicators was used to evaluate service quality across five dimensions. The items/indicators used to assess each dimension of the service quality are exhibited in Table 1.3.

Table 1.3: Indicators

Dimensions	code	Indicators
Tangible	T1	Modern amenities
	T2	Cleanliness of physical facilities
	T3	Professional appearance of staff
	T4	Cleanliness of vehicles
	T5	Comfortability of seats
Reliability	R1	Timely arrival at the Destination
	R2	Frequency of service
	R3	Frequent cancellation of trips
	R4	Punctuality of service
	R5	Accuracy of route and schedule information
	R6	Provision of alternative vehicles in the event of a breakdown
Responsiveness	RS1	Willingness to help passengers
	RS2	Promptness in responding to inquiries

	RS3	Promptness in addressing complaints
	RS4	Prompt communication of service changes
Assurance	A1	Knowledge of staff about APSTS services
	A2	Competency of drivers
	A3	Courteousness of staff
	A4	Safety and Security
	A5	Conveying trust and confidence
Empathy	E1	Convenience of operating schedule
	E2	Giving personalised attention
	E3	Showing care and concern for passengers' comfort
	E4	Giving special care to elderly persons and PWDs
	E5	Sympathetic attitude of staff
	E6	Understanding needs and preferences.

Source: The Author

4. RESULTS AND DISCUSSIONS

The results of the study are discussed in the following subsections: -

4.1. Demographic Profile of Respondents

The demographic profile of the passengers is exhibited in Table 1.4. The total number of respondents who participated in the survey was 385. The result shows an equitable gender distribution. Of the 385 respondents, 49.35% were female, and 50.64% were male. Regarding the age of the respondents, 56.62% of the respondents were between 21 to 30 years, 20% were up to 20 years old, 18.9% were aged 31 to 40 years, 3.12% were aged 41 to 50 years, and 1.29% were aged above 50 years. Hence, it can be concluded that most APSTS passengers fall in the age group of 21 to 30 years. Furthermore, 70.90% were unmarried, while 29.09% were married. Regarding travel frequency, 38.18% of passengers travel monthly, 37.40% travel occasionally, 18.96% travel weekly, and 5.45% travel daily.

Table 1.4: Demographic Classifications of Respondents

Demographic Classifications		No of Respondents	Percentage
Gender	Female	190	49.35%
	Male	195	50.64%
Age	Up to 20	77	20%
	21-30	218	56.62%
	31-40	73	18.96%
	41-50	12	3.12%
	51-60	5	1.29%
Marital Status	Married	112	29.09%
	Unmarried	273	70.90%
Frequency	Daily	21	5.45%
	Weekly	73	18.96%
	Monthly	147	38.18%
	Occasionally	144	37.40%

Source: The Author

4.2. Service Quality Gaps under Tangibles

Under this dimension, five indicators (T1, T2, T3, T4, and T5) were used to ascertain the service quality gap. Upon careful examination of the expectation scores for all five indicators, it was found that APSTS passengers hold notably very high expectations for service quality under this dimension, especially regarding the cleanliness of vehicles (T4), comfortability of seats (T5), and the cleanliness of the physical facilities (T2). The overall expectation score for this dimension was 4.54 out of 5, signifying a very high level of expectation for the tangible aspects of APSTS service. However, the perception scores of all five indicators were deficient, indicating unsatisfactory service qualities, particularly T1 (modern amenities such as AC, Wi-Fi, and GPS tracking), T4 (cleanliness of vehicles) and T2 (cleanliness of physical facilities).

Table 1.5: SERVQUAL Gap score under tangibles factor

Statements	Perceptions (Avg.)	Expectation (Avg.)	Gap Score
T1	1.75	4.32	-2.57
T2	1.97	4.61	-2.64
T3	2.67	4.23	-1.56
T4	1.96	4.82	-2.86
T5	2.58	4.73	-2.15
Average	**2.19**	**4.54**	**-2.35**

Source: The Author

Table 1.5 presents the service quality gap scores under the tangibles factor. All indicators in this dimension have a negative gap score. Among the five indicators, the highest quality gap was found in T4 (cleanliness of vehicles), followed by T2 (cleanliness of physical facilities) and T1 (modern amenities). The overall quality gap score for this dimension was (-)2.35. This indicates that passengers' expectations outweigh their perceptions, and they feel that the service quality under this dimension falls short of their expectations. Therefore, it is suggested that APSTS enhance the tangible aspects of its service quality, mainly focusing on the cleanliness of vehicles (T4), the cleanliness of its physical facilities (T2), and the modern amenities in the vehicle (T1) to reduce the quality gap under this dimension.

4.3. Service Quality Gaps under Reliability

In this dimension, the five indicators (i.e., R1, R2, R3, R4, R5, and T6) were used to ascertain the service quality gaps. The study found that all these indicators scored above 4.5 in expectations, and the overall expectation score for this dimension was 4.60 out of 5, indicating a very high level of expectation for the reliability aspects of APSTS service. In contrast, the perception scores are as follows: R1 (3.61), R2 (4.11), R3 (4.09), R4 (3.80), R5 (4.22), R6 (2.62). These deficient perception scores suggest that the passengers perceive them as unsatisfactory, particularly R6 (provision of alternative buses in the event of a breakdown of buses during the journey) and R1 (arriving at the destination on time). The service quality gap scores for the reliability dimension are outlined in Table 1.6.

Table 1.6: SERVQUAL Gap score for reliability factor

Statements	Perceptions (Avg.)	Expectation (Avg.)	Gap Score
R1	3.61	4.62	-1.01
R2	4.11	4.60	-0.49
R3	4.09	4.59	-0.50
R4	3.80	4.58	-0.78
R5	4.22	4.54	-0.32
R6	2.62	4.68	-2.06
Average	**3.74**	**4.60**	**-0.86**

Source: The Author

All indicators within this dimension exhibit negative gap scores. Further, the study found the highest quality gap in R6 (the provision of alternative vehicles in the event of a vehicle breakdown during the journey) and R1 (timely arrival at the destination). To address this disparity, it is recommended that APSTS reinforces the reliability facets of its service quality, with particular emphasis on timely bus arrivals at destinations (R1) and the provision of alternative vehicles in the event of breakdowns during journeys (R6).

4.4. Service Quality Gaps under Responsiveness

In this dimension, the researcher used four indicators (i.e., RS1, RS2, RS3 and RS4) to measure the service quality gap. The analysis revealed that all indicators scored above 4.4 in expectations, and the overall expectation score for this dimension was 4.59 out of 5, indicating a very high level of expectation for the responsiveness aspects of APSTS service. On the other hand, the low perception scores of the same indicators suggest that the passengers perceive these service attributes as unsatisfactory, particularly RS3 (addressing passengers' complaints promptly), RS1 (willingness to help passengers) and RS2 (responding to passengers' inquiries promptly).

Table 1.7: SERVQUAL Gap score for responsiveness factor

Statements	Perceptions (Avg.)	Expectation (Avg.)	Gap Score
RS1	2.67	4.44	-1.77
RS2	2.77	4.57	-1.80
RS3	2.23	4.67	-2.44
RS4	3.34	4.69	-1.35
Average	**2.75**	**4.59**	**-1.84**

Source: The Author

Table 1.7 outlines the service quality gap scores for the responsiveness dimension. All indicators within this dimension exhibit negative gap scores. The highest quality gap was found in RS4 (prompt communication of service changes to passengers), RS1 (willingness to help passengers), and RS2 (prompt response to inquiries). This suggests that passengers are highly unsatisfied with the service attributes under this dimension. Hence, it is recommended that passenger grievances be resolved through an effective mechanism that handles queries thoroughly and responds to complaints promptly.

4.5. Service Quality Gaps under Assurance

In this dimension, the researcher utilised five indicators (i.e., A1, A2, A3, A4 and A5) to evaluate the service quality. The expectation scores found are as follows: A1 (4.70), A2 (4.83), A3 (4.50), A4 (4.66), and A5 (4.38). The overall expectation score for this dimension is 4.61 out of 5. This shows a very high level of expectation for the assurance aspects of APSTS service. Conversely, the perception scores for the same variables are moderate. This is true except for A3 (courtesy of staff). This means passengers find the courtesy of APSTS staff (A3) unsatisfactory. The perception scores of these variables are as follows: A1 (4.26), A2 (4.24), A3 (1.99), A4 (3.07), and A5 (3.50). Hence, the service attributes under this dimension are relatively better, although their expectations still need to be fully met.

Table 1.8: SERVQUAL Gap score for assurance factor

Statements	Perceptions (Avg.)	Expectation (Avg.)	Gap Score
A1	4.26	4.70	-0.44
A2	4.24	4.83	-0.59
A3	1.99	4.50	-2.51
A4	3.07	4.66	-1.59
A5	3.50	4.38	-0.88
Average	**3.41**	**4.61**	**-1.20**

Source: The Author

Table 1.8 exhibits the service quality gap scores for the assurance dimension. All indicators in this dimension have negative gap scores. The specific gap scores are as follows: A1 (-0.44), A2 (-0.59), A3 (-2.51), A4 (-1.59), and A5 (-0.88). The A3 (courtesy of APSTS staff to passengers) and A4 (passenger safety and security) have the most significant gaps. Overall, the quality gap score for this dimension is -1.20. This indicates that passengers are unsatisfied with the service attributes under this dimension. To address this, it is recommended that APSTS works on aligning passengers' perceptions with their expectations by improving staff courtesy and addressing the safety and security of passengers.

4.6. Service Quality Gaps under Empathy

Under this dimension, six indicators (i.e., E1, E2, E3, E4, E5, and E6) were used to ascertain the service quality gaps. All the indicators were found to have high expectations scores except for E2 (personalised attention to passengers). The expectation scores are as follows: E1 (4.46), E2 (3.60), E3 (4.57), E4 (4.39), E5 (4.56) and E6 (4.33). The overall expectation score for this dimension is 4.32 out of 5. This shows a high level of expectation for the empathy aspects of APSTS service. In contrast, the perception scores for the same variables are abysmal, except for E1 (convenient operating hours). The perception scores for each variable are as follows: E1 (3.89), E2 (2.57), E3 (1.92), E4 (1.91), E5 (1.89) and E6 (1.96). Hence, the passengers feel that the service attributes under this factor are highly unsatisfactory and their expectations are unfulfilled.

Table 1.9 shows the service quality gap scores for the empathy dimension. All variables in this dimension have negative gap scores. The specific gap scores are as follows: E1 (-0.57), E2 (-1.03), E3 (-2.65), E4 (-2.48), E5 (-2.37), and E6 (-2.37). The most significant gaps are in E5 (sympathetic attitude of APSTS staff towards passengers), followed by E3 (care and concern for passengers' comfort), E4 (special care for elderly persons and PWDs), and E6 (understanding passengers' needs and preferences). Overall, the quality gap score in this dimension is -1.96. Hence, the passengers' expectations exceed their perceptions, and service attributes under this dimension are unsatisfactory.

To address this, it is recommended that APSTS work on aligning passengers' perceptions with their expectations by focusing on improving the sympathetic attitude of APSTS staff towards passengers, showing care and concern for passengers' comfort, giving special care to elderly persons and PWDs, and understanding passengers needs and preferences. This can be achieved through empathy training and soft skill development initiatives for frontline staff, mainly booking clerks, drivers, and conductors. Furthermore, the APSTS should implement a robust system for soliciting passenger feedback, encompassing online surveys, suggestion boxes, and digital feedback platforms.

Table 1.9: SERVQUAL Gap score for empathy factor

Statements	Perceptions (Avg.)	Expectation (Avg.)	Gap Score
E1	3.89	4.46	-0.57
E2	2.57	3.60	-1.03
E3	1.92	4.57	-2.65
E4	1.91	4.39	-2.48
E5	1.89	4.56	-2.67
E6	1.96	4.33	-2.37
Average	**2.36**	**4.32**	**-1.96**

Source: The Author

4.7. Overall Service Quality Gaps

The overall service quality gap was computed by subtracting the average perception scores from expectation scores in each APSTS service quality dimension. The overall service quality gap in APSTS is exhibited in Table 1.10. The overall perception score of APSTS service is 2.89, while the overall expectation score is 4.53. As a result, the service quality gap in APSTS is (-)1.64. Further, all service quality dimensions were observed to have negative gap scores. The gap scores of each dimension are as follows: Tangibles (-2.35), Reliability (-0.86), Responsiveness (-1.84), Assurance (-1.20) and Empathy (-1.96). These negative gap scores across all dimensions of the SERVQUAL model indicate that passengers' expectations for service are unfulfilled.

Table 1.10: Overall SERVQUAL Gap score in APSTS

Dimensions	Perceptions (Avg.)	Expectations (Avg.)	Gap Score
Tangibles	2.19	4.54	-2.35
Reliability	3.74	4.60	-0.86
Responsiveness	2.75	4.59	-1.84
Assurance	3.41	4.61	-1.20
Empathy	2.36	4.32	-1.96
Average	**2.89**	**4.53**	**-1.64**

Source: The Author

Among the five SERVQUAL dimensions, the highest quality gap was identified in the Tangibles dimension (-2.35), followed by the Empathy dimension (-1.96) and the Responsiveness dimension (-1.84). This means passengers are relatively less satisfied with these dimensions. Therefore, these areas need immediate attention. Conversely, the Reliability dimension demonstrates the lowest service quality gap (-0.86), followed by the Assurance dimension (-1.20). This means passengers are comparatively more satisfied with these dimensions. Hence, the APSTS should prioritise the dimensions with higher service quality gaps, such as Tangibles, Empathy, and Responsiveness, to improve its services.

5. Conclusions

The study aimed to evaluate the service quality of APSTS, focusing mainly on service quality gaps based on passenger perceptions and expectations. The study found significant quality gaps in all service quality dimensions of APSTS. The quality gaps in each dimension are as follows: Tangibles (-2.35), Reliability (-0.86), Responsiveness (-1.84), Assurance (-1.20) and Empathy (-1.96). The passengers of APSTS are not satisfied with the services offered to them and expect more than what they receive from APSTS in all five dimensions of the SERVQUAL framework. There is significant room for improvement in all five dimensions. Moreover, the APSTS should prioritise the dimensions with the highest quality gaps (i.e., tangibles, empathy, and responsiveness). Hence, the management of the APSTS should revise its service quality criteria separately for each service quality dimension because each dimension has a distinct but significant service quality gap and develop a refined service improvement plan (RSIP) to ensure its service quality is at par with private operators

to make its services more competitive.

Among the five indicators under the tangible dimension, the highest quality gap was found in T4 (cleanliness of vehicles), followed by T2 (cleanliness of physical facilities) and T1 (modern amenities). Therefore, The APSTS should focus mainly on the cleanliness of vehicles (T4), the cleanliness of its physical facilities (T2), and the modern amenities in the vehicle (T1) to enhance its service quality under this dimension. Further, the highest quality gap under the reliability dimension was found in R6 (providing alternative vehicles in case of a vehicle breakdown during the journey) and R1 (timely arrival at the destination). However, the service quality under this dimension is comparatively better than in other dimensions.

Moreover, the highest quality gap under the responsiveness dimension was found in RS4 (prompt communication of service changes to passengers), RS1 (willingness to help passengers), and RS2 (prompt response to inquiries). This means that APSTS staff are not helpful and not prompt in communicating service changes, responding to inquiries, and addressing complaints. Hence, it is recommended that passenger grievances be resolved through an effective mechanism that handles queries thoroughly and responds to complaints quickly. Among the indicators under the assurance dimension, the most significant gaps were found in A3 (courtesy of APSTS staff to passengers) and A4 (passenger safety and security). Therefore, the APSTS should focus on staff courtesy, passengers' safety, and security to improve its service quality under this dimension of its services.

With regard to the empathy dimension, the highest quality gaps were found to be in E5 (sympathetic attitude of APSTS staff towards passengers), followed by E3 (care and concern for passengers' comfort), E4 (special care for elderly persons and PWDs), and E6 (understanding passengers' needs and preferences). Therefore, it is recommended to focus on improving the sympathetic attitude of APSTS staff towards passengers, showing care and concern for passengers' comfort, giving special care to elderly persons and PWDs, and understanding passengers' needs and preferences. This can be achieved through empathy training and soft skill development initiatives for frontline staff, mainly booking clerks, drivers, and conductors. Furthermore, the APSTS should implement a robust system for soliciting passenger feedback, encompassing online surveys, suggestion boxes, and digital feedback platforms to improve its service attributes under this dimension.

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