International Journal of Economic Practices and Theories (IJEPT)
ISSN: 2247-7225
Volume 2026, Issue 1

Bengaluru Namma Metro Through the Servqual Lens: A Study of Passenger Experiences

[1]Dr Kumuda P R,

Associate Professor, Department of Finance and BFSI, M.S. Ramaiah Institute of Management, Bangalore, Email: kumuda@msrim.org

[2]Dr. Ranjith P V,

Professor, (Corresponding Author),Operations And Supply Chain Management Department, School Of Management, Presidency University, Rajankunte, Bangalore -560119, Email: ranjith.pv@presidencyuniversity.in

[3]Dr Kiran Kumar Thoti,

Professor and Dean, Management Studies, Vidya Vikas Institute of Engineering and Technology, Mysuru-570028, kirankumar.thoti@vidyavikas.edu.inm, ORCID: 0000-0002-6678-9425

[4]Dr Manish Kumar Srivastava,

Professor, School Of Management, Christ Deemed to Be University, Bengaluru,560029,Email: manishkumar.srivastava@christuniversity.in

[5]Dr C N Udaya Shankar,

Professor, Indus Business Academy, Bangalore, Email: udaya.s@iba.ac.in, ORCID: 0009-0002-7142-4698

ABSTRACT

RESEARCH BACKGROUND

Passengers constitute the fundamental core of any transportation system, thus underscoring the importance of providing high-quality services to attract and retain them. Service quality is integral to fostering customer loyalty and satisfaction. Furthermore, effective customer segmentation is essential for the strategic marketing and delivery of services. A comprehensive understanding of the diverse needs and expectations of various customer segments is crucial for developing targeted operational strategies that enhance service delivery. The Bengaluru Namma Metro serves as a rapid transit system for the city of Bengaluru in Karnataka, India

METHODOLOGY.

This research employed a quantitative approach to evaluate passengers' perceptions of service quality on the Bengaluru Namma Metro. Data were collected through an online survey, which gathered responses from 114 participants

MAJOR FINDING AND CONCLUSION

This study seeks to investigate the perceptions of passengers from different segments concerning five key dimensions of service quality: Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The scope of this study is specifically confined to passengers utilizing the Bengaluru Namma Metro, with an emphasis on the implications for service operations. Overall, these findings underscore the critical role of interpersonal relationships and responsive service in shaping passengers' perceptions of quality, with higher satisfaction reported by those who feel their needs are adequately addressed

Keywords: Service Quality, Customer loyalty, Tangibles, Reliability, Responsiveness, Assurance and Empathy.

1. INTRODUCTION

The Bengaluru Namma Metro is a pivotal component of the urban transportation infrastructure in Bengaluru, Karnataka, India. Launched with the objective of alleviating traffic congestion and promoting sustainable public transport, the Namma Metro has rapidly transformed the commuting landscape of one of India's fastest-growing

cities. Spanning over 42 kilometers, the metro system currently operates two lines—the Purple Line and the Green Line—with further expansions planned to accommodate the increasing demand for efficient urban mobility. Since its inception, the Namma Metro project has seen substantial financial investment. The total estimated cost for the project is around ₹26,405 crore (approximately $3.6 billion). This investment includes funding from various sources, such as the Government of India, the Government of Karnataka, and international financing institutions. The Bangalore Metro Rail Corporation Limited (BMRCL) is the implementing agency responsible for overseeing the project's development.

The first phase of the Namma Metro, which was inaugurated in 2011, comprised 42.3 kilometers of track and required an investment of approximately ₹11,609 crore (around $1.6 billion). This phase included 40 stations and was designed to serve an estimated 1 million passengers daily. The second phase, currently under construction, is set to add an additional 72 kilometers and over 60 stations, with an expected investment of ₹15,000 crore (approximately $2 billion). Upon completion, this expansion aims to significantly increase the metro's capacity and connectivity, with projections indicating a daily ridership of 2 million passengers. The Namma Metro service not only addresses the pressing issue of urban congestion but also promotes eco-friendly transport solutions. By providing a reliable and efficient alternative to road transport, the metro system reduces travel time, lowers vehicle emissions, and enhances the overall quality of life for residents. The integration of the metro with other modes of public transport, such as buses and auto-rickshaws, further facilitates seamless travel across the city.

Given the importance of service quality in attracting and retaining passengers, the Namma Metro is committed to delivering a superior travel experience. The metro features modern amenities, including clean and well-maintained stations, digital signage, and real-time updates on train schedules. The service quality dimensions of Tangibles, Reliability, Responsiveness, Assurance, and Empathy are critical areas of focus for the metro authorities, as they seek to cater to the diverse needs of passengers from various demographic segments.

The concept of service quality is fundamentally a comparison between customer expectations and actual performance. A customer's expectations regarding a particular service are influenced by various factors, including recommendations, personal needs, and prior experiences. Consequently, a study exploring the perceptions of service quality among different passenger segments is of significant importance. This research aims to segment passengers of the Bengaluru Namma Metro based on demographic characteristics such as gender, age, education level, and occupation, as well as journey-related factors including distance travelled and frequency of travel. The study seeks to investigate the perceptions of passengers across these segments concerning five key dimensions of service quality: Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The scope of this study is specifically confined to the passengers utilizing the Bengaluru Namma Metro.

2. LITERATURE REVIEW

Murkumbi and Srinivas (2023) conducted an economic evaluation of the Namma Metro Phase 1 project. They found that the metro system offers significant economic and social advantages, such as lower fuel consumption and reduced travel time. They emphasized that these benefits are more important than just financial figures, suggesting that a thorough assessment is needed to understand the metro's wider effects on urban transport in Bengaluru. However, their study does not compare the economic benefits of different metro lines or how they affect various parts of the city. Bysani et al. (2023) looked into the impact of Namma Metro on traffic congestion. Their findings show that the metro has improved traffic flow during busy hours, especially on the Purple Line. They recommend optimizing feeder networks and better urban planning to make the metro more effective in reducing congestion. However, they do not explore the long-term effects of the metro on overall urban mobility.

The Study on Ridership and Connectivity Challenges by the World Resources Institute (WRI) revealed that actual ridership is lower than expected due to poor first- and last-mile connectivity. The study points out that younger users mainly use the metro, while wealthier individuals often prefer personal vehicles. This research highlights a gap in understanding how socio-economic factors affect ridership among different income groups and age ranges. In their analysis of land use reforms, Parkhomenko et al. (2023) argue that easing building height restrictions near metro stations could boost economic growth and improve residents' quality of life. They stress the importance of transit-oriented development (TOD) for maximizing the benefits of Namma Metro. However, their study does not

consider potential issues like gentrification and displacement that can arise from such reforms. Lastly, Gurumurthy (2023) compiled various historical insights in Bengaluru as On Pen & Paper, documenting how the city has evolved into a modern hub. This work emphasizes the need to understand local history to tackle current urban challenges but does not connect cultural heritage directly with contemporary urban planning issues.

Kumar and Prakash (2018) investigated the impact of service quality on customer satisfaction within the Delhi Metro. Their study highlighted that reliability—measured by punctuality and consistency of service—plays a crucial role in shaping passenger experiences. The authors employed a structured questionnaire to gather data from a diverse passenger base, concluding that timely service delivery significantly enhances customer loyalty and overall satisfaction in urban transit systems. This underscores the necessity for metro services to maintain high reliability standards in a competitive transportation landscape.

Kour and Gaur (2020) applied the SERVQUAL model to evaluate service quality in both bus and metro services in Bangalore. Their findings revealed that tangibles—such as the cleanliness and maintenance of vehicles and stations—alongside assurance, which encompasses the competency and courtesy of staff, significantly influence passenger satisfaction. The researchers employed quantitative methods to analyze data from passengers, demonstrating that improvements in these areas could lead to enhanced customer experiences and a shift towards greater public transport usage.

Mukherjee and Banerjee (2020) conducted a comprehensive analysis of bus services in Kolkata using the SERVQUAL framework. Their study employed a mixed-methods approach, combining surveys and focus group discussions. Findings indicated that reliability and empathy dimensions were especially influential in determining overall satisfaction levels among passengers. The authors suggested that enhancing the quality-of-service delivery in terms of punctuality and providing personalized assistance could substantially improve passenger perceptions and usage rates of bus services.

Verma and Chaturvedi (2021) conducted a study examining how demographic variables influence service quality perceptions among metro passengers in Delhi. Utilizing stratified sampling techniques, the research revealed that factors such as age, gender, and education level significantly impacted perceptions of responsiveness and assurance. For instance, younger passengers tended to prioritize technological responsiveness, while older passengers placed greater emphasis on reliability and safety. This indicates that transport services must tailor their offerings to accommodate the diverse expectations of various demographic segments.

3. SIGNIFICANCE OF THE STUDY

Passengers are the essential foundation of any transportation system, making the provision of quality services paramount for attracting and retaining them. Therefore, service quality is instrumental in fostering customer loyalty and satisfaction. As competition within the transportation sector intensifies, organizations increasingly strive to deliver superior products and services. The Bengaluru Namma Metro represents a critical infrastructure initiative designed to address the pressing issue of traffic congestion in the city. Understanding the relationship between product and service quality is vital, and this can be achieved by examining passengers' perceptions of the service quality provided by the Bengaluru Namma Metro. Such insights will not only inform strategies for enhancing service delivery but also contribute to the overall effectiveness and sustainability of urban transportation in Bengaluru.

4. OBJECTIVES OF THE STUDY

This study aims to evaluate passengers' perceptions of service quality on the Bengaluru Namma Metro by examining the influence of demographic factors (gender, age, occupation, and education) and journey-related factor travel frequency across the SERVQUAL dimensions such as Tangibles, Reliability, Responsiveness, Assurance, and Empathy. Specifically, the objectives include assessing facility cleanliness, signage effectiveness, train schedule consistency, staff responsiveness, complaint resolution, passenger safety and comfort, and accommodations for special needs. Actionable recommendations will be provided to enhance overall service quality.

5. METHODOLOGY

This research employed a quantitative approach to evaluate passengers' perceptions of service quality on the Bengaluru Namma Metro. Data were collected through an online survey, which gathered responses from 114 participants. The survey utilized a Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5) to assess various service quality dimensions, including Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The data analysis was conducted using SPSS software, beginning with factor analysis to identify underlying relationships among the service quality dimensions and confirm the validity of the constructs. This was followed by reliability analysis to assess the internal consistency of the survey items, ensuring that the measurements were reliable. Finally, Pearson's correlation testing was performed to examine the relationships between demographic and journey-related factors and passengers' perceptions of the service quality dimensions. This comprehensive methodological approach facilitated actionable insights for enhancing service quality on the Bengaluru Namma Metro.

6. DATA ANALYSIS AND INTERPRETATION

A sample of 114 passengers was selected through an online survey to gather data on perceptions of service quality in the Bengaluru Namma Metro. The analysis first categorizes respondents based on various demographic variables.

TABLE 1: DEMOGRAPHICS

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	44	38.6	38.6	38.6
	25-35	40	35.1	35.1	73.7
	29-35	1	.9	.9	74.6
	30-35	2	1.8	1.8	76.3
	34-35	1	.9	.9	77.2
	35-45	12	10.5	10.5	87.7
	45 and above	14	12.3	12.3	100.0
	Total	114	100.0	100.0	

The table presents the age distribution of 114 participants, revealing a significant skew towards younger individuals. The largest group is aged 18-25, comprising 38.6% of the sample, followed closely by the 25-35 age group at 35.1%. The subgroups 29-35 and 30-35 show minimal representation, while participants aged 35-45 account for 10.5% and those 45 and above for 12.3%. Cumulatively, over 73% of participants are under 35, indicating a predominantly youthful demographic. This focus on younger ages may limit the generalizability of the findings to older populations.

TABLE 2: GENDER DISTRIBUTION

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	46	40.4	40.4	40.4

	Male	**68**	**59.6**	**59.6**	**100.0**
	Total	**114**	**100.0**	**100.0**	

The table displays the gender distribution among 114 participants. Males represent the majority at 68 individuals, accounting for 59.6% of the sample, while females comprise 46 participants, or 40.4%. The data shows a clear gender imbalance, with a higher representation of males compared to females. This distribution is crucial for understanding any potential gender-related biases in the study, as the predominance of male participants may influence the overall findings and interpretations.

TABLE 3: CITY OF RESIDENCE

City of Residence:					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Barbil, Odisha	1	.9	.9	.9
	Belagavi	4	3.5	3.5	4.4
	Bengaluru	64	56.1	56.1	60.5
	Bidar	2	1.8	1.8	62.3
	Chikkamagalur	3	2.6	2.6	64.9
	Chittoor	1	.9	.9	65.8
	Davangere	5	4.4	4.4	70.2
	Dharwad	1	.9	.9	71.1
	Gulbarga	1	.9	.9	71.9
	Hampi	1	.9	.9	72.8
	Hubballi	3	2.6	2.6	75.4
	Kalaburagi	3	2.6	2.6	78.1
	Kolar	1	.9	.9	78.9
	Madanapalle	1	.9	.9	79.8
	Mangaluru	4	3.5	3.5	83.3
	Mysore	1	.9	.9	84.2
	Mysuru	6	5.3	5.3	89.5
	Shimoga	5	4.4	4.4	93.9
	Tumakuru	3	2.6	2.6	96.5
	Udupi	4	3.5	3.5	100.0
	Total	114	100.0	100.0	

The table illustrates the distribution of participants based on their city of residence, with a total of 114 individuals surveyed. The majority reside in Bengaluru, with 64 participants, making up 56.1% of the sample. This highlights a significant concentration of respondents from this city. Other cities have much smaller representation: Mysuru follows with 6 participants (5.3%), and several others, such as Davangere and Shimoga, have 5 participants each

(4.4%). Many cities, like Barbil and Chittoor, have very few respondents (1 participant each). Overall, the data reveals a strong skew towards Bengaluru, suggesting that the findings may primarily reflect the perspectives of individuals from this urban area, which could affect the generalizability of the results to other regions.

TABLE 4: CITY OF OCCUPATION

Occupation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	61	53.5	53.5	53.5
	Retired	1	.9	.9	54.4
	Student	44	38.6	38.6	93.0
	Unemployed	8	7.0	7.0	100.0
	Total	114	100.0	100.0	

The table presents the occupational distribution of 114 participants. The largest group is employed individuals, totalling 61 participants, which constitutes 53.5% of the sample. This indicates a predominantly working population. Students represent the second-largest group, with 44 participants (38.6%), highlighting a significant presence of individuals engaged in education. There are also 8 unemployed participants (7.0%), while only 1 individual is retired (0.9%). Overall, the data reflects a workforce-oriented demographic, with a notable proportion of students, which may influence the study's findings and insights regarding the perspectives of employed and student populations.

Factor Analysis:

The factor analysis employed Principal Component Analysis with Varimax rotation, which yielded distinct groupings of service quality dimensions, corroborating the SERVQUAL framework. **Factor loadings below 0.5 were excluded to maintain clarity in the table.**

Items are organized by their respective SERVQUAL dimensions for easier interpretation

TABLE 5: FACTOR ANALYSIS

Factor Loading Table		
Item	**Dimension (SERVQUAL)**	**Factor Loading**
Staff genuinely listen to my concerns and feedback while using Bengaluru City Metro.	Empathy (EMP)	0.711
Staff resolve complaints or issues effectively during my travel.	Empathy (EMP)	0.704
Staff assist promptly with queries or concerns while using Bengaluru City Metro.	Responsiveness (RES)	0.695
Customer service representatives are approachable and friendly in their interactions on Bengaluru City Metro.	Empathy (EMP)	0.629
Bengaluru City Metro accommodates passengers with special needs effectively.	Empathy (EMP)	0.614

Updates about delays or service changes are reliable and timely.	Reliability (REL)	0.605
Bengaluru City Metro can handle busy travel times effectively.	Reliability (REL)	0.906
Bengaluru City Metro adheres to its service promises in terms of frequency and punctuality.	Reliability (REL)	0.728
Trains run on Bengaluru City Metro according to the advertised schedule.	Reliability (REL)	0.663
I am kept effectively informed during service interruptions by the metro service.	Responsiveness (RES)	-
The seating areas are comfortable and sufficient for passengers during busy times.	Tangibles (TAN)	0.803
Assistance with lost items or inquiries about them is received quickly.	Responsiveness (RES)	0.731
Ticket counters and information desks have sufficient staff to help without long waits.	Responsiveness (RES)	0.714
Amenities like restrooms and waiting areas are well-kept and easy to access in Bengaluru City Metro.	Tangibles (TAN)	0.732
The overall cleanliness of Bengaluru City Metro stations and trains is satisfactory.	Tangibles (TAN)	0.695
I feel secure while traveling on Bengaluru City Metro.	Assurance (ASR)	0.58
The staff is knowledgeable when addressing questions on Bengaluru City Metro.	Assurance (ASR)	0.527
Amenities like restrooms and waiting areas are well-kept and easy to access in Bengaluru City Metro.	Tangibles (TAN)	0.709
I feel confident that my belongings are safe while using Bengaluru City Metro.	Assurance (ASR)	0.689
Communication regarding safety measures on Bengaluru City Metro is satisfactory.	Assurance (ASR)	0.572

Tangibility (TAN): Tangible aspects of the service are reflected in items such as "The seating areas are comfortable and sufficient for passengers during busy times" (**.803**) and "The overall cleanliness of Bengaluru City Metro stations and trains is satisfactory" (**.695**). The loadings suggest that the physical aspects of the service are generally well-received, underscoring the importance of maintaining high standards in facility cleanliness and comfort.

Reliability (REL): This dimension is notably robust, with high loadings such as "Bengaluru City Metro can handle busy travel times effectively" (**.906**) and "Bengaluru City Metro adheres to its service promises in terms of frequency and punctuality" (**.728**). This suggests that passengers perceive the service as reliable and consistent, reinforcing the critical role of reliability in customer satisfaction.

Responsiveness (RES): The responsiveness dimension is adequately represented, particularly with items like "Assistance with lost items or inquiries about them is received quickly" (**.731**) and "Ticket counters and

information desks have sufficient staff to help without long waits" (**.714**). These results indicate a positive perception of staff availability and efficiency, which are essential for enhancing user experience.

Assurance (ASR): While this dimension is present, items such as "I feel secure while traveling on Bengaluru City Metro" (**.580**) indicate a need for improvement. The relatively lower loadings suggest that enhancing communication regarding safety measures and staff knowledge could elevate passengers' confidence in the service.

Empathy (EMP): Items reflecting staff responsiveness and passenger care, such as "Staff genuinely listen to my concerns and feedback" (loading **.711**) and "Staff resolve complaints or issues effectively during my travel" (**.704**), indicate a strong emphasis on empathetic service. These findings highlight the importance of staff attentiveness in fostering positive passenger experiences, though there is potential for improvement in the overall perception of empathetic interactions.

TABLE 7: RELIABILITY ANALYSIS

Dimension	Number of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Empathy (EMP)	6	0.935	0.936
Reliability (REL)	3	0.829	0.83
Responsiveness (RES)	3	0.882	0.885
Tangibles (TAN)	4	0.847	0.852
Assurance (ASR)	4	0.58	-

The reliability analysis indicates high levels of internal consistency across the various SERVQUAL dimensions of service quality as assessed in the Bengaluru City Metro. The Empathy dimension, with a Cronbach's Alpha of 0.935, demonstrates exceptional reliability. This suggests that the items measuring staff attentiveness and responsiveness to passenger feedback effectively capture the essence of empathy, which is critical for customer satisfaction.

The Reliability dimension, focusing on the dependability of services, also shows robust internal consistency with a Cronbach's Alpha of 0.829. This reinforces the perception that Bengaluru City Metro generally adheres to its service promises, such as punctuality and operational reliability. Furthermore, the Responsiveness dimension, which reflects the ability of staff to assist passengers promptly, has a Cronbach's Alpha of 0.882. This indicates that passengers perceive the staff as responsive and helpful, aligning well with expectations set forth by the SERVQUAL model. The Tangibles dimension, assessing the physical aspects of the service environment—such as cleanliness and accessibility—has a Cronbach's Alpha of 0.847. This suggests that the metro's physical facilities are viewed positively by passengers, enhancing their overall experience. However, the Assurance dimension presents a Cronbach's Alpha of 0.580. This lower value indicates that the items in this dimension may not reliably capture the concept of assurance, which includes factors such as safety and staff knowledge. This highlights an area for further investigation, as passengers' perceptions of safety and staff competence are essential components of the SERVQUAL framework.

TABLE 8: CORRELATION ANALYSIS: TANGIBILITY

		TAN	TAN	ASR	ASR
Amenities like restrooms and waiting areas are well-kept and easy to access in Bengaluru City Metro.	**TAN**	1			
The overall cleanliness of Bengaluru City Metro stations and trains is satisfactory.	**TAN**	.667**	1		
I feel secure while traveling on Bengaluru City Metro.	**ASR**	.721**	.607**	1	
The staff is knowledgeable when addressing questions on Bengaluru City Metro.	**ASR**	.682**	.575**	.695**	1

The correlation analysis highlights significant relationships in Bengaluru City Metro's service quality, focusing on Tangibility (TAN) and Assurance (ASR). A strong correlation of **.667** exists between the cleanliness of amenities and overall station cleanliness, indicating that well-maintained facilities enhance perceptions of cleanliness. Notably, the **.721** correlation between well-kept amenities and feelings of security underscores that cleanliness significantly contributes to passengers' sense of safety. Additionally, a **.682** correlation with staff knowledge suggests that better-maintained facilities enhance perceptions of staff competence. Thus, maintaining clean and accessible amenities emerges as the main component for improving overall passenger satisfaction.

TABLE 9: RELIABILITY

	Variable	REL	REL	REL
Trains run on Bengaluru City Metro according to the advertised schedule.	**REL**	1		
Bengaluru City Metro can handle busy travel times effectively.	**REL**	.554**	1	
Bengaluru City Metro adheres to its service promises in terms of frequency and punctuality.	**REL**	.708**	.596**	1

The correlation analysis assesses reliability dimensions of the Bengaluru City Metro. The variable "Trains run on time" shows a perfect correlation of 1.00. A moderate positive correlation ($r = 0.554$, $p < 0.01$) exists with "Bengaluru Metro can handle busy travel times effectively," indicating that passengers who perceive timely operations also believe the metro manages peak volumes well. Strong correlations are found between "adherence to service promises" and both "timely operations" ($r = 0.708$, $p < 0.01$) and "busy time management" ($r = 0.596$, $p < 0.01$). These findings emphasize the crucial role of reliability in overall service quality perception.

TABLE 10: RESPONSIVENESS

		TAN	RES	RES
The seating areas are comfortable and sufficient for passengers during busy times.	**TAN**	1		
Assistance with lost items or inquiries about them is received quickly.	**RES**	.741**	1	
Ticket counters and information desks have sufficient staff to help without long waits.	**RES**	.652**	.765**	1

The correlation analysis highlights strong relationships among service quality aspects in Bengaluru City Metro. A strong positive correlation of **.741** between comfortable seating areas and quick assistance with lost items suggests that passengers who find seating adequate also perceive responsiveness favourably. Additionally, a correlation of **.652** between comfortable seating and adequately staffed ticket counters indicates that physical comfort influences perceptions of service efficiency. Furthermore, a strong correlation of **.765** between responsiveness items emphasizes that efficient service at ticket counters is linked to prompt assistance with inquiries. Overall, improving both comfort and responsiveness can enhance passenger satisfaction significantly.

TABLE 11: ASSURANCE

		TAN	ASR	ASR
Amenities like restrooms and waiting areas are well-kept and easy to access in Bengaluru City Metro.	**TAN**	1		
I feel confident that my belongings are safe while using Bengaluru City Metro.	**ASR**	.667**	1	
Communication regarding safety measures on Bengaluru City Metro is satisfactory.	**ASR**	.645**	.660**	1

The correlation analysis examines the relationships among various service quality dimensions related to tangibility (TAN) and assurance (ASR) within the Bengaluru City Metro context. The variable assessing the cleanliness and accessibility of amenities, such as restrooms and waiting areas, is positively correlated with passengers' feelings of safety regarding their belongings ($r = 0.667$). This suggests that when passengers perceive the metro's amenities as well-maintained, their confidence in the security of their possessions is heightened. Additionally, there is a strong correlation between passengers' confidence in the safety of their belongings and the effectiveness of communication regarding safety measures ($r = 0.660$). This implies that clear and satisfactory communication enhances passengers' assurance about their safety while using the metro.

TABLE 12: EMPATHY

	Variable	EMP	EMP	EMP	EMP	REL	RES
Bengaluru City Metro accommodates passengers with Special needs effectively.	**EMP**	1					

Customer service representatives are approachable and friendly in their interactions on Bengaluru City Metro.	**EMP**	.803**	1				
Staff resolve complaints or issues effectively during my travel.	**EMP**	.688**	.775**	1			
Staff genuinely listen to my concerns and feedback while using Bengaluru City Metro.	**EMP**	.753**	.817**	.792**	1		
Updates about delays or service changes are reliable and timely.	**REL**	.621**	.613**	.657**	.636**	1	
Staff assist promptly with queries or concerns while using Bengaluru City Metro.	**RES**	.691**	.755**	.694**	.779**	.625**	1

The correlation analysis reveals significant relationships among various service quality dimensions perceived by passengers of the Bengaluru City Metro, specifically within the SERVQUAL framework of Empathy (EMP), Reliability (REL), and Responsiveness (RES). Strong positive correlations were observed among empathy-related variables, particularly between the metro's accommodation for special needs and the approachability of customer service representatives ($r = 0.803$), indicating that perceptions of inclusivity enhance overall satisfaction. Additionally, effective complaint resolution correlated significantly with both approachability ($r = 0.775$) and staff attentiveness ($r = 0.792$), suggesting that positive interactions build trust in the metro's complaint management. Reliability factors, such as updates on delays, also demonstrated important connections with empathy dimensions, emphasizing the necessity of reliable communication for maintaining passenger confidence. Overall, these findings underscore the critical role of interpersonal relationships and responsive service in shaping passengers' perceptions of quality, with higher satisfaction reported by those who feel their needs are adequately addressed.

7. CONCLUSION

The comprehensive analysis of service quality perceptions among passengers of the Bengaluru City Metro offers significant insights aligned with the SERVQUAL framework, highlighting the intricate interplay between various service dimensions. The findings reveal that dimensions such as empathy, reliability, and assurance are not only crucial for passenger satisfaction but also significantly influence overall perceptions of service quality. A prominent theme from the correlation analysis is the strong relationship between empathy-related variables. Passengers who perceive staff as approachable and attentive are more likely to feel confident that their needs are understood and met. This underscores the importance of interpersonal relationships in service delivery, suggesting that enhancing staff training focused on empathy and communication skills could further elevate the customer experience.

The reliability dimension, particularly regarding adherence to schedules and effective handling of busy travel times, emerged as a key factor influencing passenger perceptions. The positive correlations between reliable service delivery and passenger satisfaction highlight the need for the Bengaluru Metro to ensure punctuality and consistency in its operations. Addressing any discrepancies in service promises will foster greater trust among passengers and improve their overall experience. Furthermore, the analysis indicates that tangible factors, including the cleanliness and maintenance of facilities, play a critical role in shaping perceptions of safety and comfort. Ongoing maintenance and attention to the physical environment are essential for fostering a sense of security among users. In conclusion, the study illustrates that the dimensions of service quality as articulated in the SERVQUAL model are intricately connected, with each dimension impacting passenger perceptions of the Bengaluru City Metro. By prioritizing improvements in empathy, reliability, and tangible aspects of service, the

metro can not only increase passenger satisfaction and loyalty but also enhance its overall operational effectiveness.

8. RECOMMENDATIONS AND FUTURE SCOPE

To enhance the service quality of Bengaluru City Metro, several strategic recommendations are proposed. Primarily, it is imperative to invest in comprehensive staff training programs that prioritize empathy, effective communication, and responsiveness to passenger inquiries and complaints. Such initiatives are anticipated to foster improved interactions and cultivate trust between personnel and passengers. Furthermore, augmenting reliability through the establishment of robust mechanisms that ensure punctuality and provide real-time updates regarding service alterations will significantly enhance the overall passenger experience.

In addition, meticulous monitoring of cleanliness and maintenance standards across trains and stations is essential, alongside expedited responses to reported issues. Special emphasis should be placed on accommodating passengers with special needs, The implementation of regular surveys to assess passenger perceptions will facilitate ongoing improvements in response to emerging concerns. There exists substantial potential for longitudinal studies that track variations in service quality perceptions over time, particularly after the enactment of these recommendations. Exploring the role of technology in enhancing service delivery presents another promising avenue for future research. The introduction of mobile applications for real-time updates and customer service chatbots could markedly improve responsiveness. Lastly, investigating the impact of sustainable practices on passenger perceptions will further solidify Bengaluru City Metro's standing as a responsible and modern urban transit option.

REFERENCES

1. Alonso, B. et al., (2018). Modelling User Perception of Taxi Service Quality. Transport Policy, 63, 157-164.
2. Anderson, E. et al., (1993). The Antecedents and Consequences of Customer Satisfaction for Firms. Marketing Science, 12(2), 125-143.
3. Bysani, S., Kumar, A., & Suresh, K. (2023). Impact of Namma Metro on traffic congestion in Bengaluru: An evaluation of the Purple Line. Journal of Urban Transport, 12(2), 145-159.
4. Collier, J. & Bienstock, C. (2014). A Conceptual Framework for Measuring E-Service Quality. Creating and Delivering Value in Marketing, 158-162.
5. Gurumurthy, S. (2023). On Pen & Paper: A historical account of Bengaluru's evolution into a modern hub. Bengaluru Historical Society.
6. Kour, P., & Gaur, R. (2020). Evaluating service quality in bus and metro services in Bangalore: An application of the SERVQUAL model. International Journal of Transport Studies, 15(3), 67-78.
7. Kumar, A., & Prakash, R. (2018). The impact of service quality on customer satisfaction in the Delhi Metro. Asian Transport Studies, 5(4), 349-363.
8. Murkumbi, R., & Srinivas, A. (2023). Economic evaluation of the Namma Metro Phase 1 project: A comprehensive analysis of benefits. Transport Economics Review, 8(1), 23-40.
9. Mukherjee, A., & Banerjee, P. (2020). Analyzing bus services in Kolkata through the SERVQUAL framework: A mixed-methods approach. Journal of Public Transport Research, 10(2), 99-113.
10. Parkhomenko, O., Joshi, N., & Gupta, S. (2023). Land use reforms and their impact on economic growth: The case for easing building height restrictions near metro stations. Urban Development Review, 14(1), 85-102.
11. Verma, R., & Chaturvedi, A. (2021). Demographic variables and service quality perceptions among metro passengers in Delhi. Journal of Transportation and Demographics, 9(2), 231-245.