

Evaluating Customer Satisfaction And Service Quality In Select Telecom Enterprises Using SERVQUAL Model

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Keywords: Customer Satisfaction, Telecom Services, Service Quality, SERVQUAL Model, Bharti Airtel, Vodafone Idea, BSNL, Comparative Study, India.	Abstract The telecommunications industry has been the key enabler in improving connectivity, digital access, and socio-economic growth of India in its fast-developing digital environment. The research paper gives a detailed comparative report of customer satisfaction and service quality of the top three telecommunication service providers in India, namely Bharti Airtel, Vodafone Idea (VI), and Bharat Sanchar Nigam Limited (BSNL). The study uses the SERVQUAL theory to determine service quality under the five variables, namely: tangibility, reliability, responsiveness, assurance, and empathy. The research is carried out in three individual areas of Telangana, namely Karimnagar, Warangal, and Medchal-Malkajgiri districts, covering both urban and rural surroundings to attract the various visions of the consumers. Four hundred and fifty respondents were involved in the research, and the data were collected using a structured questionnaire as the main research instrument. The quantitative analysis was done based on the Chi-Square tests, which were used to check the relationship between customer category and demographic variables, as well as paired sample t-tests, which were used to compare customer expectations and perceptions. It can be seen that the results demonstrate that there is a significant variation in satisfaction levels between service providers and geographic locations. Although the performances of any of the individual players, such as Airtel and Vodafone Idea, are seen on an uphill trend in the urban contexts, BSNL seems to have a bit of favorable position in some of the rural markets by virtue of their prices and past existence. The study shows that there exist serious service gaps in 21 out of 22 service quality parameters, with infrastructure facilities only that satisfy customers infrastructurally. The results will give operational recommendations that need to be improved and measures that can be taken to ensure enhanced customer satisfaction that is relatable in telecoms operations in the public sector, especially where most operators are at risk of becoming non-competitive in the technological world.
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1. Introduction

1.1 Background

The Indian telecommunications industry has undergone a remarkable transformation over the past decade, emerging as one of the world's largest and most dynamic telecom markets. With over 1.17 billion subscribers as of 2023, India represents the second-largest telecommunications market globally (TRAI, 2023). This unprecedented growth has been fueled by rapid technological innovations, widespread smartphone adoption, decreasing data costs, and intensifying market competition (Deloitte, 2022). The launch of 4G services and the ongoing rollout of 5G technology have fundamentally

redefined consumer expectations regarding speed, reliability, and service quality (Ernst & Young, 2023).

The Indian telecom landscape is characterized by intense competition among a mix of private and public sector operators. Private players such as Bharti Airtel and Vodafone Idea have invested heavily in infrastructure modernization, customer engagement initiatives, and innovative service offerings to capture market share. Meanwhile, Bharat Sanchar Nigam Limited (BSNL), the government-owned telecommunications company, continues to hold strategic significance in ensuring connectivity in rural and remote areas while maintaining affordability for economically disadvantaged segments (Department of Telecommunications, 2023).

1.2 Service Quality in Telecommunications

Service quality has emerged as a critical differentiator in the highly competitive telecommunications industry. As the market matures and basic connectivity becomes commoditized, telecom operators increasingly recognize that superior service quality is essential for customer acquisition, retention, and sustainable competitive advantage (Zeithaml et al., 2006). In the telecommunications context, service quality encompasses multiple dimensions including network reliability, customer service responsiveness, billing accuracy, value-added services, and overall customer experience (Lovelock & Wirtz, 2011).

The intangible nature of telecommunications services presents unique challenges in measuring and managing service quality. Unlike physical products, services are characterized by their intangibility, heterogeneity, inseparability, and perishability, making quality assessment more complex and subjective (Parasuraman et al., 1988). Service quality is measured by the customers in terms of the perception of the service given to them relative to their expectation, hence making the dimension of quality measurement dynamic and multidimensional (Gronroos, 1984).

1.3 The SERVQUAL Model

SERVQUAL model by Parasuraman, Zeithaml and Berry (1988) is now among the most frequent tools of component measuring service quality in different industries. The model presents the service quality as a discrepancy between customer expectations and perception in five-dimension areas:

1. **Tangibility:** A physical look of facilities, equipment, people, and communication materials
2. **Reliability:** the capacity to complete the service that is ensured to be carried out reliably and precisely
3. **Responsiveness:** The readiness to assist the consumers and to deliver prompt assistance
4. **Assurance:** the skills and courtesy of employees and their capacity to invoke trust and credence
5. **Empathy:** The emotional and personal care that the particular firm gives its customers

The fact that the SERVQUAL model is comprehensive and has been shown valid makes it especially applicable in keying the service quality in the field of telecommunication, where there are equal parts technical and human interaction with customers (Seth et al., 2005).

1.4 The Indian Telecom Market Context

Indian telecommunications market is an intricate setting of service quality evaluation. Several reasons make this complex:

Market Structure: The few large players have taken over the market after years of its consolidation. By 2023, Reliance Jio claims about 40 percent of the market, followed by Bharti Airtel (33 percent), Vodafone Idea (18 percent), and BSNL (9 percent) (TelecomTalk.info, 2024).

Urban-Rural Divide: There exist such deep differences between the urban-rural setting in aspects of infrastructure, availability of services, and the expectations of customers. In the cities, there is a dense 4G/5G network and enough service providers, whereas in rural areas the main problem is the absence of functioning connectivity (TRAI, 2024).

Price Sensitivity: Indian folks are very conscious about the price, causing strong price war among the operators. This cost squeeze usually affects the investments in service quality as well as customer services infrastructure (Indian Brand Equity Foundation, 2024).

Regulatory Environment: The Telecom Regulatory Authority of India (TRAI) plays a crucial role in setting quality standards, consumer protection measures, and ensuring fair competition. Regular regulatory interventions shape service delivery parameters and customer expectations (TRAI, 2023).

Digital Transformation: The rapid digitalization of the Indian economy, accelerated by initiatives like Digital India and the COVID-19 pandemic, has elevated the importance of reliable telecommunications services for education, healthcare, commerce, and governance (Telecom India Reports, 2023).

1.5 Research Context

Given this dynamic and competitive landscape, assessing customer satisfaction and service quality has become crucial for understanding user preferences, identifying service gaps, and formulating strategies for improvement. This study focuses on three major telecom operators—Bharti Airtel, Vodafone Idea, and BSNL—operating in Telangana state, which represents a microcosm of India's diverse telecommunications market with its mix of urban centers and rural areas.

Telangana, formed in 2014 as India's youngest state, has emerged as a significant technology and business hub. The state capital, Hyderabad, hosts major IT companies and has one of the highest teledensities in India. However, the state also encompasses rural and semi-urban areas that face connectivity challenges, making it an ideal setting for studying service quality variations across different demographic and geographic segments.

2. Literature Review

2.1 Service Quality Concepts and Evolution

The notion of service quality has changed considerably after the turn of the 1980s as scholars started to realize a distinct set of issues related to the measurement of quality in the service sector. Gronroos (1984) was the first to present a Nordic view of the topic, developing a model in which it was possible to speak about technical quality (what the customer will get) and functional quality (what the service can be provided in a way). These two views revealed that customers do not only base their view of service quality on technical service delivery levels, but also on the whole service delivery process.

Based on this premise, therefore, Parasuraman et al. (1985, 1988) come up with the gaps model of service quality that lists five gaps that may result in unsuccessful service provision. Their further adoption of the SERVQUAL instrument came up with a convenient instrument for gauging service quality in various service situations. The five dimensions, tangibles, reliability, responsiveness, assurance, and empathy used in SERVQUAL model have been confirmed in many industries and places with different cultures (Zeithaml et al., 2006).

The SERVQUAL approach was controversial to Cronin and Taylor (1992), who have come out to suggest the SERVPERF approach of measuring service quality using perceptions alone as opposed to the expectation-perception gap. Their studies brought a series of debates concerning the most suitable conceptualization of service quality and the related measurement. Brady and Cronin (2001) made another contribution to the area, producing a hierarchical model that incorporates several points of view on the service quality.

2.2 Service Quality in Telecommunications

The telecommunications industry is complex in its service quality management because it involves extensive technical involvement, fast evolution in technology, and vitality of the network infrastructure. Sureshchandar et al. (2001) determined that among the factors that apply to the telecom service quality are network quality, customer service, pricing transparency, and value-added services. In their study, it was important to point out that telecom customers merge technical quality performance and service interaction quality levels to ascertain quality.

Kumar et al. (2009) examined the factors that determine customer satisfaction in the Malaysian mobile services industry, and concluded network quality, customer care, and pricing were the most decisive parameters in determining customer satisfaction. These authors depicted that the cultural context plays a significant role in the world in how we set and bear expectations of service quality. In a similar study, Malik et al. (2012) explored the role of brand image and service quality in influencing the consumer buying behavior in the telecom market in Pakistan, proving the major significance of service quality upon customer expenditure and brand choice.

2.3 Service Quality Studies in the Indian Context

Indian telecommunications market has seen a lot of research interest owing to its size, growth rate, and uniqueness. Researchers (Srivastava and Sharma, 2013) have examined the investigations on the service quality, corporate image, and customer satisfaction in the context of the Indian telecom industry, and found a strong association between the dimensions of the service quality and the overall satisfaction. They investigated that the corporate image mediated the relationship between service quality and satisfaction.

Kundu and Datta (2021) have completed an extensive survey of customer satisfaction in the telecom industry in India by singling out network reliability and customer services as the most critical elements. They found that there was a considerable difference in satisfaction rate between urban and rural customers, as rural customers tolerated failures in service provision much better because they did not have as many options.

The SERVQUAL model was adopted in a study by Sharma and Mehta (2020) to evaluate customer satisfaction with Indian telecom services and registered the highest gap between the expectations and perceptions on all five dimensions. Their research noted that Indian customers value reliability and responsiveness, and it was associated with the fact that telecommunications are of great importance in day-to-day living and conducting business.

2.4 Comparative reports about Telecom Operators

Several analysts have made comparative studies of various telecom operators to formulate those that are best practices and those that are competitive. Singh and Sirdeshmukh (2000) came up with a theory of agency and mechanism of trust in consumer satisfaction assessments and judgments of loyalty using the same in making comparisons of the public and the private telecom operators. The results of their study implied that the performance of the private operators in establishing customer trust and satisfaction was typically better than the orientation of the companies in the field of the public sector companies.

Bansal and Taylor (1999) examined service switching behavior in telecommunications, identifying service quality failures as the primary driver of customer churn. Their research emphasized the high costs of customer acquisition in telecom markets, making service quality improvement essential for customer retention and profitability.

Recent studies have increasingly focused on the impact of digital transformation on service quality expectations. The rapid adoption of smartphones, mobile applications, and digital payment systems has created new service quality dimensions related to digital experience, app functionality, and omnichannel service delivery (Telecom India Reports, 2023).

2.5 Research Gaps and Study Rationale

Despite the extensive literature on telecommunications service quality, several research gaps justify the current study:

1. **Regional Specificity:** Most studies focus on national-level analysis or major metropolitan areas. There is limited research examining service quality in specific states or regions that encompass both urban and rural areas.
2. **Comparative Analysis:** Few studies provide simultaneous comparison of public and private sector operators using consistent methodology and sampling across diverse geographic areas.
3. **Post-4G Era Assessment:** Limited research captures service quality dynamics in the post-4G rollout period, particularly examining how enhanced network capabilities have influenced customer expectations.
4. **Urban-Rural Disparities:** While acknowledged in literature, few studies systematically compare service quality perceptions between urban and rural customers within the same geographic region.
5. **Demographic Influences:** There is insufficient understanding of how various demographic factors interact with service provider choice and satisfaction levels in the Indian context.

This study addresses these gaps by providing a comprehensive comparative analysis of three major telecom operators across urban and rural areas of Telangana, utilizing the established SERVQUAL framework while incorporating contemporary service quality considerations.

3. Research Methodology

3.1 Research Design

This study employs a descriptive research design with a quantitative approach to evaluate and compare customer satisfaction and service quality across selected telecom service providers. The research design was structured to capture both comparative insights across operators and variations between urban and rural customer segments. A cross-sectional survey method was adopted to collect data at a single point in time, providing a snapshot of current customer perceptions and expectations.

3.2 Research Objectives

The study was guided by the following specific objectives:

1. To examine the relationship between customer category and various demographic characteristics of users
2. To determine whether demographic factors influence the selection or preference for particular telecom service providers
3. To compare customer expectations and perceptions regarding service quality in selected telecom service providers
4. To assess whether the service quality dimensions of tangibility, reliability, responsiveness, assurance, and empathy meet customer expectations
5. To offer practical recommendations for improving customer satisfaction and competitiveness, especially for underperforming service providers

3.3 Hypotheses Development

Based on the research objectives and literature review, the following hypotheses were formulated:

Demographic Association Hypotheses:

- H01: There is a noteworthy association between company category and locality of respondents
- H02: There is a noteworthy association between company category and type of telecom service utilized
- H03: There is a remarkable association between company category and experience of utilizing telecom services
- H04: There is no remarkable association between customer category and occupation of customers
- H05: Significant association does not exist between customer category and gender of sample respondents
- H06: There is no significant association between customer category and marital status of respondents
- H07: There is no remarkable association between customer category and income of respondents
- H08: There is no noteworthy association between customer category and education status of respondents
- H09: There is no remarkable association between customer category and age of respondents

Service Quality Hypothesis:

- H10: There is no noteworthy variation in the expectations and perceptions on service quality in select telecom service providers

3.4 Population and Sampling

3.4.1 Target Population

The target population for this study comprised all active mobile telecommunications subscribers of Bharti Airtel, Vodafone Idea, and BSNL in Telangana state. According to TRAI (2023), Telangana has approximately 35 million mobile subscribers, distributed across urban and rural areas.

3.4.2 Sampling Frame

The sampling frame was defined as adult mobile subscribers (aged 18 years and above) who had been using services from one of the three selected operators for at least six months. This criterion ensured that respondents had sufficient experience with their service provider to form meaningful opinions about service quality.

3.4.3 Sampling Technique

A multi-stage purposive sampling technique was employed:

Stage 1: Selection of districts - Three districts were purposively selected to represent different regions of Telangana:

- Karimnagar (Northern Telangana)
- Warangal (Central Telangana)
- Medchal-Malkajgiri (Southern Telangana/Greater Hyderabad region)

Stage 2: Urban-rural stratification - Within each district, both urban and rural areas were identified for data collection

Stage 3: Operator-wise distribution - Respondents were selected to ensure adequate representation from each of the three telecom operators

Stage 4: Individual respondent selection - Respondents were approached at various locations including markets, educational institutions, office complexes, and residential areas

3.4.4 Sample Size

The sample size was determined using Cochran's formula for finite populations:

$$n = Z^2pq/e^2$$

Where:

- Z = Z-score at 95% confidence level (1.96)
- p = estimated proportion of population (0.5 for maximum variability)
- $q = 1-p$ (0.5)
- e = margin of error (0.05)

This yielded a minimum sample size of 384. To account for potential non-responses and ensure adequate representation across all segments, the sample size was increased to 450 respondents.

The final sample distribution was:

- 150 respondents per district (3 districts $\times$ 150 = 450)
- 225 urban respondents (50%)
- 225 rural respondents (50%)
- 150 respondents per telecom operator

3.5 Data Collection

3.5.1 Instrument Development

A structured questionnaire was developed based on the SERVQUAL model, adapted for the telecommunications context. The questionnaire consisted of four main sections:

Section A: Demographic Profile

- Age, gender, education, occupation, income
- Location (urban/rural)
- Years of service usage
- Type of services used

Section B: Service Quality Expectations

- 22 statements covering five SERVQUAL dimensions
- 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree)

Section C: Service Quality Perceptions

- 22 statements mirroring the expectations section
- 5-point Likert scale

Section D: Overall Satisfaction and Loyalty

- Overall satisfaction rating
- Likelihood to recommend
- Switching intentions

3.5.2 Pilot Testing

A pilot study was conducted with 30 respondents (10 per operator) to test the questionnaire's clarity, comprehension, and completion time. Based on feedback, minor modifications were made to improve question wording and flow.

3.5.3 Data Collection Process

Data collection was conducted over three months (January-March 2024) by a team of trained field investigators. The process involved:

- Face-to-face interviews for rural respondents to address literacy concerns
- Self-administered questionnaires for urban respondents with interviewer assistance when needed
- Quality checks through random callbacks to 10% of respondents
- Daily data verification and coding

3.6 Variables and Measurement

3.6.1 Independent Variables

- Telecom service provider (Airtel/Vodafone Idea/BSNL)
- Demographic variables (age, gender, education, occupation, income, location)
- Service usage characteristics (duration, type of services)

3.6.2 Dependent Variables

- Service quality perceptions across five dimensions
- Gap scores (Perception - Expectation)
- Overall customer satisfaction

3.6.3 Service Quality Dimensions

Based on the SERVQUAL model, five dimensions were measured:

1. **Tangibility** (4 items):
 - Modern infrastructure and equipment
 - Visual appeal of physical facilities
 - Professional appearance of employees
 - Facility appearance matching service type
2. **Reliability** (5 items):
 - Keeping service promises
 - Sympathetic problem resolution
 - Dependable service delivery
 - Timely service provision
 - Accurate record keeping
3. **Responsiveness** (4 items):
 - Informing customers about service timing
 - Prompt service delivery
 - Willingness to help customers
 - Never too busy to respond
4. **Assurance** (4 items):
 - Trustworthy employees
 - Feeling safe in transactions
 - Polite and courteous employees
 - Knowledgeable employees
5. **Empathy** (5 items):
 - Individual attention to customers
 - Personal attention from employees
 - Understanding specific needs
 - Customer's best interests at heart
 - Convenient operating hours

3.7 Data Analysis Techniques

3.7.1 Descriptive Statistics

- Frequency distributions for demographic variables
- Mean scores for expectation and perception items
- Standard deviations to assess response variability

3.7.2 Reliability and Validity Testing

- **Cronbach's Alpha:** Used to test internal consistency of the questionnaire. The obtained value of 0.763 indicated good reliability (above the threshold of 0.7)
- **Content Validity:** Ensured through extensive literature review and expert consultation
- **Construct Validity:** Confirmed through significant Pearson correlation values between related items

3.7.3 Hypothesis Testing

1. **Chi-Square Test:** Used to test associations between categorical variables (customer category and demographic factors). Tests were conducted at 5% significance level with 2 degrees of freedom
2. **Paired Sample t-Test:** Used to compare expectations and perceptions for each service quality statement. This test is appropriate as the same respondents provided both expectation and perception ratings

3.7.4 Gap Analysis

Service quality gaps were calculated as: Gap Score = Perception Score - Expectation Score

Negative gap scores indicate that perceptions fall short of expectations, while positive scores suggest exceeded expectations.

3.7.5 Software Tools

- **SPSS Version 25:** Primary statistical analysis
- **MS Excel:** Data cleaning, preliminary analysis, and visualization

3.8 Ethical Considerations

The study adhered to ethical research principles:

- Informed consent was obtained from all participants
- Anonymity and confidentiality were assured
- Participation was voluntary with the right to withdraw
- No sensitive personal information was collected
- Data was used solely for academic research purposes

3.9 Limitations of Methodology

While the methodology was designed to be comprehensive, certain limitations should be acknowledged:

1. **Cross-sectional Design:** The research will focus on quantification of perceptions at one moment, removing knowledge about changes over time
2. **Self-Reported Data:** The responses can be prone to either recall bias or social desirability bias
3. **Geographic Limitation:** The findings are related to Telangana, which may restrict the generalizability to the other Indian states
4. **Equal Sample Distribution:** Equal sampling amongst the operators does not necessarily indicate a genuine ratio of the market share

Nevertheless, the limitations notwithstanding, the methodology offers a great platform on which to compare the quality of services among operators as well as customer classes, and this will prove to be of great value both academically and practically.

4. Results and Analysis

4.1 Demographic Profile of Respondents

The survey involved 450 respondents from three districts of Telangana with an equal number of users from three top telecom operators. The demographic characteristics of the sample are presented below:

4.1.1 Geographic Distribution

- Urban respondents: 225 (50%)
- Rural respondents: 225 (50%)
- District-wise: Karimnagar (150), Warangal (150), Medchal-Malkajgiri (150)

4.1.2 Service Provider Distribution

- Bharti Airtel: 150 respondents (33.3%)
- Vodafone Idea: 150 respondents (33.3%)
- BSNL: 150 respondents (33.3%)

4.1.3 Gender Distribution

- Male: 267 respondents (59.3%)
- Female: 183 respondents (40.7%)

4.1.4 Age Distribution

- 18-25 years: 108 respondents (24%)
- 26-35 years: 162 respondents (36%)
- 36-45 years: 99 respondents (22%)

- 46-55 years: 54 respondents (12%)
- Above 55 years: 27 respondents (6%)

4.1.5 Educational Qualification

- Below High School: 45 respondents (10%)
- High School: 90 respondents (20%)
- Undergraduate: 189 respondents (42%)
- Postgraduate: 108 respondents (24%)
- Professional/Technical: 18 respondents (4%)

4.1.6 Occupation

- Student: 72 respondents (16%)
- Employed (Private): 144 respondents (32%)
- Employed (Government): 63 respondents (14%)
- Self-employed/Business: 99 respondents (22%)
- Homemaker: 45 respondents (10%)
- Retired/Others: 27 respondents (6%)

4.1.7 Monthly Income

- Below ₹20,000: 117 respondents (26%)
- ₹20,001-40,000: 162 respondents (36%)
- ₹40,001-60,000: 99 respondents (22%)
- ₹60,001-80,000: 45 respondents (10%)
- Above ₹80,000: 27 respondents (6%)

4.1.8 Experience with Telecom Services

- Less than 1 year: 36 respondents (8%)
- 1-3 years: 126 respondents (28%)
- 3-5 years: 144 respondents (32%)
- 5-10 years: 99 respondents (22%)
- More than 10 years: 45 respondents (10%)

4.2 Chi-Square Test Results: Association between Customer Category and Demographics

Table 1 presents the chi-square test results examining associations between customer category (choice of telecom operator) and various demographic variables.

Table 1: Association between Customer Category and Demographic Variables

S. No	Hypothesis	Chi-square Value	P-value	Decision
1	H01: Association with Locality	47.942	0.000	Reject H0
2	H02: Association with Service Type	8.115	0.087	Accept H0
3	H03: Association with Experience	16.296	0.038	Reject H0
4	H04: Association with Occupation	4.193	0.938	Accept H0
5	H05: Association with Gender	1.267	0.531	Accept H0
6	H06: Association with Marital Status	1.944	0.378	Accept H0
7	H07: Association with Income	12.391	0.135	Accept H0
8	H08: Association with Education	13.447	0.200	Accept H0
9	H09: Association with Age	5.379	0.496	Accept H0

4.2.1 Significant Associations

Locality and Customer Category (H01) The chi-square value of 47.942 with $p=0.000$ indicates a highly significant association between customer location (urban/rural) and choice of telecom operator. Further analysis revealed:

- Airtel showed stronger preference in urban areas (68% urban vs. 32% rural)
- BSNL had higher rural penetration (42% urban vs. 58% rural)
- Vodafone Idea showed relatively balanced distribution (52% urban vs. 48% rural)

Experience and Customer Category (H03) The chi-square value of 16.296 with $p=0.038$ indicates a significant association between years of service usage and operator choice. Analysis showed:

- Long-term users (>5 years) showed higher loyalty to BSNL (38%)
- Newer users (<3 years) preferred private operators (Airtel 42%, Vodafone 35%)
- Mid-term users (3-5 years) were distributed relatively evenly

4.2.2 Non-Significant Associations

The analysis revealed no significant associations between customer category and:

- Type of telecom service utilized ($p=0.087$)
- Occupation ($p=0.938$)
- Gender ($p=0.531$)
- Marital status ($p=0.378$)
- Monthly income ($p=0.135$)
- Educational status ($p=0.200$)
- Age ($p=0.496$)

These findings suggest that demographic factors such as gender, age, income, and education do not significantly influence the choice of telecom operator, indicating relatively uniform market penetration across demographic segments.

4.3 Service Quality Gap Analysis

The paired sample t-test was conducted to compare customer expectations and perceptions across 22 service quality statements. Table 2 presents the detailed results.

4.3.1 Tangibility Dimension

Table 2: Paired Sample t-Test Results for Service Quality Dimensions

Pair	Statement	Mean Gap	t-value	p-value	Result
1	Up-to-date infrastructure	0.093	1.205	0.229	Non-significant
2	Visually appealing facilities	-0.798	-9.623	0.000	Significant
3	Well-dressed employees	0.900	14.574	0.000	Significant
4	Facilities match service type	-0.609	-6.836	0.000	Significant

The tangibility dimension showed mixed results. While customers' expectations regarding up-to-date infrastructure were largely met (non-significant gap), significant gaps existed in visual appeal of facilities and matching of facilities with service type.

4.3.2 Reliability Dimension

Pair	Statement	Mean Gap	t-value	p-value	Result
5	Keeping promises	0.422	7.016	0.000	Significant
6	Sympathetic to problems	0.280	3.872	0.000	Significant
7	Dependable service	0.358	6.072	0.000	Significant
8	Timely service	0.516	7.144	0.000	Significant
9	Accurate records	0.656	12.095	0.000	Significant

All reliability dimension items showed significant gaps between expectations and perceptions, with accurate record keeping showing the largest gap (0.656), followed by timely service delivery (0.516).

4.3.3 Responsiveness Dimension

Pair	Statement	Mean Gap	t-value	p-value	Result
10	Informing service timing	0.156	2.947	0.003	Significant
11	Prompt service	1.218	15.190	0.000	Significant
12	Willingness to help	0.616	9.942	0.000	Significant
13	Not too busy to respond	1.658	26.457	0.000	Significant

The responsiveness dimension revealed the largest service gaps, particularly in employees being available to respond to requests (gap = 1.658) and providing prompt service (gap = 1.218).

4.3.4 Assurance Dimension

Pair	Statement	Mean Gap	t-value	p-value	Result
14	Trustworthy employees	0.898	14.328	0.000	Significant
15	Safe communication	1.156	18.105	0.000	Significant
16	Polite employees	1.069	16.936	0.000	Significant
17	Management support	1.460	30.474	0.000	Significant

The assurance dimension showed consistently high gaps across all items, with management support to employees showing the highest gap (1.460), indicating systemic issues in employee empowerment.

4.3.5 Empathy Dimension

Pair	Statement	Mean Gap	t-value	p-value	Result
18	Individual attention	1.464	31.456	0.000	Significant
19	Personal attention	0.789	11.242	0.000	Significant
20	Understanding needs	1.136	18.291	0.000	Significant
21	Customer's best interest	1.140	16.301	0.000	Significant
22	Convenient hours	1.138	21.246	0.000	Significant

The empathy dimension showed substantial gaps, with individual attention having the highest gap (1.464), suggesting that telecom operators struggle to provide personalized service.

4.4 Operator-wise Service Quality Performance

Further analysis was conducted to compare service quality performance across the three operators:

4.4.1 Overall Gap Scores by Operator

- Bharti Airtel: Average gap = 0.72
- Vodafone Idea: Average gap = 0.84
- BSNL: Average gap = 1.12

Airtel showed the smallest overall service quality gap, followed by Vodafone Idea, while BSNL had the largest gap between customer expectations and perceptions.

4.4.2 Dimension-wise Performance

Best Performing Dimensions by Operator:

- Airtel: Tangibility (gap = 0.42) and Reliability (gap = 0.51)
- Vodafone Idea: Tangibility (gap = 0.48) and Assurance (gap = 0.76)
- BSNL: Reliability (gap = 0.89) and Tangibility (gap = 0.92)

Worst Performing Dimensions by Operator:

- Airtel: Empathy (gap = 0.98) and Responsiveness (gap = 0.91)
- Vodafone Idea: Empathy (gap = 1.05) and Responsiveness (gap = 0.97)
- BSNL: Empathy (gap = 1.42) and Assurance (gap = 1.38)

4.5 Urban-Rural Service Quality Comparison

Analysis of service quality gaps between urban and rural areas revealed interesting patterns:

4.5.1 Urban Areas

- Average service quality gap: 0.76
- Best performing dimension: Tangibility (gap = 0.51)
- Worst performing dimension: Empathy (gap = 1.02)

4.5.2 Rural Areas

- Average service quality gap: 1.04
- Best performing dimension: Reliability (gap = 0.82)
- Worst performing dimension: Responsiveness (gap = 1.31)

Rural customers experienced larger service quality gaps across all dimensions, with particularly pronounced differences in responsiveness and assurance dimensions.

4.6 Key Findings Summary

1. **Demographic Influences:** Only locality and service experience significantly influence operator choice, while other demographic factors show no significant association.
2. **Service Quality Gaps:** Significant gaps exist between customer expectations and perceptions across 21 out of 22 service quality parameters.

3. **Infrastructure Exception:** The only area meeting customer expectations is up-to-date infrastructure facilities.
4. **Dimension Performance:** Empathy and responsiveness show the largest service quality gaps across all operators.
5. **Operator Comparison:** Private operators (Airtel and Vodafone Idea) outperform the public sector operator (BSNL) in overall service quality.
6. **Urban-Rural Divide:** Rural customers experience significantly larger service quality gaps compared to urban customers.
7. **Consistency of Gaps:** The consistency of gaps across operators suggests industry-wide challenges in meeting customer expectations.

5. Discussion

5.1 Interpretation of Demographic Associations

The finding that locality significantly influences telecom operator choice aligns with the infrastructure realities of the Indian telecommunications market. Private operators like Bharti Airtel have historically focused on urban markets where higher average revenue per user (ARPU) justifies infrastructure investments. The stronger urban preference for Airtel (68%) reflects this strategic focus and the resulting superior service quality in urban areas. Conversely, BSNL's higher rural penetration (58%) can be attributed to its universal service obligation as a public sector undertaking and its extensive legacy infrastructure in rural areas.

The significant association between service experience and operator choice reveals interesting loyalty patterns. Long-term users showing higher loyalty to BSNL (38% of users with >5 years' experience) suggest that despite service quality gaps, switching costs and familiarity create retention. This finding is consistent with Bansal and Taylor's (1999) research on switching barriers in telecommunications. The preference of newer users for private operators indicates that market dynamics have shifted, with new customers prioritizing service quality over traditional factors like coverage alone.

The lack of significant associations with other demographic variables (gender, age, income, education) challenges conventional market segmentation approaches in telecommunications. This finding suggests that telecom services have become universally essential, transcending traditional demographic boundaries. It implies that operators should focus less on demographic-based targeting and more on service quality improvements and geographic expansion strategies.

5.2 Analysis of Service Quality Gaps

The comprehensive service quality gap analysis reveals systemic challenges facing the Indian telecommunications industry. The fact that 21 out of 22 service parameters show significant gaps indicates that customer expectations have evolved faster than service delivery improvements.

5.2.1 Infrastructure Paradox

The only non-significant gap in up-to-date infrastructure ($p=0.229$) presents an interesting paradox. While operators have invested heavily in network infrastructure, particularly with 4G rollouts, they have neglected other service quality dimensions. This finding suggests that the industry has adopted a technology-first approach at the expense of holistic service quality. The significant gaps in other tangibility aspects, such as visual appeal of facilities (-0.798) and facility-service alignment (-0.609), indicate that physical service touchpoints remain neglected.

5.2.2 Reliability Challenges

The significant gaps across all reliability dimensions are particularly concerning given that reliability is often considered the most important service quality dimension (Parasuraman et al., 1988). The largest gap in accurate record keeping (0.656) suggests systemic issues with billing systems and customer data management. This finding is especially problematic in an era of data protection concerns and regulatory scrutiny. The gaps in keeping promises (0.422) and timely service (0.516) indicate operational inefficiencies that erode customer trust.

5.2.3 Responsiveness Crisis

The responsiveness dimension showing the highest individual gap scores (up to 1.658 for "not too busy to respond") reveals a critical service delivery failure. This finding suggests that despite technological

advances enabling automated responses and self-service options, human interaction points remain severely understaffed or poorly managed. The prompt service gap (1.218) indicates that customers face significant delays in issue resolution, contradicting the promise of digital-age efficiency.

5.2.4 Trust and Assurance Deficit

The substantial gaps in the assurance dimension, particularly in management support for employees (1.460), reveal structural issues within telecom organizations. When employees lack adequate support, their ability to inspire customer confidence diminishes. The gap in safe communication (1.156) is particularly concerning given increasing cybersecurity threats and privacy concerns. These findings suggest that operators need to invest not just in technical security but also in building customer perceptions of safety and trust.

5.2.5 Empathy Vacuum

The empathy dimension showing the highest average gaps across operators indicates a fundamental disconnect between standardized service delivery and customer expectations of personalized attention. The individual attention gap (1.464) suggests that mass-market approaches have failed to accommodate customer needs for personalized service. This finding is particularly relevant as global telecommunications trends move toward hyper-personalization through data analytics and AI.

5.3 Operator Performance Comparison

The operator-wise analysis reveals a clear hierarchy in service quality delivery, with implications for market dynamics and competitive positioning.

5.3.1 Bharti Airtel's Relative Success

Airtel's lowest average gap score (0.72) reflects its market leadership position and sustained investments in service quality. The company's relatively better performance in tangibility and reliability dimensions aligns with its premium positioning strategy. However, even Airtel's significant gaps in empathy (0.98) and responsiveness (0.91) indicate that market leadership doesn't translate to service excellence.

5.3.2 Vodafone Idea's Middle Ground

Vodafone Idea's intermediate position (average gap = 0.84) reflects the challenges of merger integration. The company, formed through the merger of Vodafone India and Idea Cellular, appears to be struggling to harmonize service standards while managing financial pressures. The relatively better performance in tangibility suggests focus on visible assets, but gaps in empathy and responsiveness indicate deeper service culture issues.

5.3.3 BSNL's Structural Challenges

BSNL's highest average gap (1.12) confirms the structural challenges facing public sector enterprises in competitive markets. The particularly high gaps in empathy (1.42) and assurance (1.38) suggest bureaucratic cultures incompatible with modern service expectations. A relatively higher performance of BSNL in reliability in rural settings, however, shows its advantages in providing basic services where competition is minimal.

5.4 Service Gap The urban and rural service split

Digital divide problems of gaps in service quality are especially evident as the difference between the two areas of urban (0.76) and rural (1.04) is quite substantial. Several factors cause this discrepancy:

5.4.1 Infrastructure constraints

Urban areas have well-developed network infrastructure, where there are a lot of services offered, but rural areas have limited network infrastructure, where there are more maintenance ups and downs. The larger rural responsiveness gap value (1.31) probably is enhanced by the fact that there are fewer service stations and poor access to technical services.

5.4.2 Economics Feasibility

The vicious cycle of low ARPU in rural markets is characterized by the fact that little revenue can justify little expenditures in service, hence continuing to maintain quality divides. This economic fact raises the question of universal service dreams and demands new models of service delivery.

5.4.3 Variation in Expectation

Interestingly, the rural customers are more tolerant, even though they experience bigger gaps. So is the case with BSNL, which continues to operate in the rural areas even after breaking down in terms of service. Such recommendations imply that availability prevails over quality in underserved markets, but this might change with a rise in digital literacy in the rural region.

5.5 Implications to Theories

The results have several contributions to make on the theory of service quality:

1. **Contextual SERVQUAL Application:** The research confirms the applicability of SERVQUAL to the Indian telecommunications situation and also demonstrates nuances by dimensions. The infrastructure paradox implies that modifications to the model in industry-specific terms are necessitated.
2. **Expectation Evolution:** The global gaps among and between operators imply that the customer expectations are dictated by the international service levels instead of local market factors, which supports the convergence theory of the service expectations.
3. **Public-Private Gap in the Performance:** On every dimension, the standard performance ranking (privately owned operators performing better than public) is consistent, which suggests an institutional theory approach to considering organizational efficiency.

5.6 Practical Implications

The results provide the following few operational points that operators in the telecommunications sector can use to act upon:

5.6.1 Priorities in Service Design

1. **Responsiveness Enhancement:** Having shown the critical gaps, the priority of the operators is to decrease response time by:
 - Increased number of people involved in customer service
 - AI-based preliminary response solutions
 - Definite ways of escalation
2. **Empathy Integration:** To go beyond facilitation of standardized service, it takes:
 - Customer journey mapping
 - Individualization using data analytics
 - Service protocols particular to segments
3. **Employee Empowerment:** The gap in the management support suggests that there is a requirement for:
 - Decision rights of frontline employees
 - Holistic Training Opportunities
 - Service quality-related performance incentives

5.6.2 Strategic Recommendations

For Private Operators:

- Leverage service quality advantages for premium pricing
- Expand rural presence with modified service models
- Invest in empathy and personalization as differentiators

For BSNL:

- Urgent organizational culture transformation
- Partnership models for service delivery
- Focus on reliability strengths while addressing glaring gaps

For Regulators:

- Enforce minimum service quality standards
- Create incentives for rural service quality improvements
- Regular service quality audits and public reporting

6. Conclusions and Recommendations

6.1 Conclusions

This exhaustive research tended towards customer satisfaction and service quality in the telecommunications industry of India, concerning three major operators in Telangana state, which has several critical findings that have great importance to the service providers, regulators, and policymakers.

6.1.1 Demographic factors on the selection of the operator

It is seen that the customer preference of telecommunications providers depends on just two demographic variables, namely, locality (urban/rural roughage) and years of service experience. This observation questions the usual methods of market segmentation, which obsess much on demographic factors such as age, earnest revenue, sex, and schooling. This is confirmed by the close relationship between locality ($t_{22} = 47.942, p < 0.001$), arguing that not much has changed with regard to the urban-rural disparity in telecommunication service delivery and preferences. The urban customers incline toward the services of the private operators (especially Airtel), whereas the rural customers are comparatively more tolerant of BSNL, irrespective of the difference in quality of services.

The strong correlation that was obtained between the service experience and the choice of the operators suggests that customer loyalty patterns change with tenure. Long-term users demonstrate higher tolerance for service gaps, particularly with BSNL, suggesting that familiarity and switching costs create retention despite suboptimal service quality. Conversely, newer market entrants show clear preferences for private operators, indicating evolving market dynamics and rising service expectations.

6.1.2 Pervasive Service Quality Gaps

The most striking finding is the existence of significant gaps between customer expectations and perceptions across 21 out of 22 service quality parameters. This near-universal dissatisfaction indicates systemic issues in the Indian telecommunications industry that transcend individual operators. The sole exception—up-to-date infrastructure—paradoxically highlights the industry's misplaced priorities, focusing on network technology while neglecting holistic service experience.

The magnitude of gaps varies significantly across SERVQUAL dimensions, with responsiveness and empathy showing the most critical failures. The largest individual gap in employee availability (1.658) signals a crisis in customer service delivery that technology alone cannot resolve. These findings suggest that despite India's emergence as a global telecommunications market, service quality remains a significant challenge requiring urgent attention.

6.1.3 Operator Performance Hierarchy

A clear performance hierarchy emerges from the analysis, with private operators consistently outperforming the public sector. Bharti Airtel's relatively superior performance (average gap = 0.72) compared to BSNL (average gap = 1.12) reflects fundamental differences in organizational culture, operational efficiency, and customer focus. However, even the best-performing operator shows significant gaps, indicating that none have achieved service excellence.

Vodafone Idea's intermediate position reveals the challenges of post-merger integration while managing market pressures. BSNL's performance, particularly weak in empathy and assurance dimensions, confirms the structural challenges facing public sector enterprises in competitive markets. In conjunction with these tendencies, it may be assumed that the ownership structure and organizational agility do play a big role in the ability to deliver service quality.

6.1.4 Division of service quality between urban and rural areas

Based on these findings, the study establishes that there is a large service quality gap between the rural and urban environments, and the service gap separating rural customers is large by about 37 percent larger than urban customers. This discrepancy is an aspect of several factors which comprise infrastructure constraints, economic feasibility, and availability of service. The very sharp values of the weakness in responsiveness and assurance dimensions in the rural regions signify that the systems of service support have their fixed focus in the urban locations, notwithstanding the rural market significance.

6.1.5 Company Challenges on the Industrywide Level

The uniformity of the service quality gaps through operators indicates industry problems which cannot be resolved by individual measures of competitive strategy. Such systemic problems are:

1. Customer Service Crisis: Within the industry, general lacks regarding responsiveness characterize the poor customer service infrastructure within the industry
2. Personalization Deficit: Empathy gaps are large in indicating inability to achieve mass-market to individualized service delivery models
3. Trust and Security: Big gaps between assurance and confidence expose issues of security and the safety of transactions by customers
4. Operational Inefficiencies: Service delivery processes have systemic weakness that shows in gaps in reliability

6.2 Suggestions

According to the findings of the research, the recommendations as to various stakeholders are offered as follows:

6.2.1 For Telecom Operators

1. Immediate Actions (0-6 months):

- Increase in Customer Service
- Do the same to customer service personnel by hiring 30- 40 percent more to fill lapses in responsiveness
- Adopt 24/7 multilingual services of rural markets
- Use AI-enhanced chatbots to keep simple queries at bay
- Ensure maximum response time Service Level Agreement (SLA)

2. Training and Empowerment of the Employees

- Introduce extensive soft skill instruction based on empathy and communication
- Give decision-making power on routine matters of front-line employees
- Conduct employee satisfaction program that will motivate the service delivery
- Design client-focused KPIs that are tied to pay

3. Service recovering systems

- Put in vigilant service withdrawal sensors
- Put in place automatic compensation for service failures
- Establish special escalation reporting processes when it comes to serious problems
- Service improvement by customer feedback loop regularly

Medium term Initiatives (6-18 months) :

1. Digital Transformation of Service Excellence

- Create self-service mobile apps on a broad basis
- Use predictive analytics that will help solve issues before they happen
- Develop customer-specific service dashboards
- Use blockchain to invoice and resolve controversy accountably

2. Rural Service Enhancement

- Install the mobile service vans to cover the remote areas
- Become a partner of the local entrepreneurs in the delivery of last-mile services
- Create interfaces to vernacular language and aid
- Develop service packages that are rural-specific with suitable SLAs

3. The Change of the Organizational Culture

- Technology first to customer first mentality shift
- Introduce customer journey maps to each touchpoint
- Establish inter-functional models to enhance service quality
- Determine customer advocacy programs

Long-term Strategies (18+ months):

1. At Scale Personalization

- AI-committed customer classification and customization of service
- Predictive modeling to single customer requirements
- Develop dynamic service packages according to the pattern of usage
- Establish Ecosystem partnerships in value-added services

2. Upgrades of Infrastructure and Facilities

- Upgrade the customer service centres to have better tangibility ratings
- Install augmented reality in remote technical support
- Erect experience centers in big cities
- Come up with green and sustainable service delivery models

6.2.2 For Regulators (TRAI and DoT)

1. Enhanced Quality Standards

- Brocade expanding the QoS parameters out of network statistics into service dimensions

- Order employee satisfaction surveys regularly by standardized methodology
- Tighten penalty procedures in case of violation of service quality on a repeated basis
- Establish geographical differences of service quality benchmarks

2. Consumer Protective Preventions

- Independent ombudsman of telecom service disputes
- Express the requirement to report quality of service openly
- Educate the people on their rights to services through consumer awareness campaigns
- Introduce data protection and privacy laws with heavier penalties

3. Market Development Activities

- Encourage policy mechanisms of improving quality of service in the rural areas
- Develop infrastructure sharing requirements to enhance viability of the rural areas
- Coming up with universal service obligations with quality parameters
- Sponsor digital literacy initiatives to increase service use

6.2.3 Policymakers

1. Improvement of Digital India

- Incorporating the service quality objectives in the Digital India initiatives
- Form rural connectivity alliances between the public and the private
- Set up telecom service innovation centres of excellence
- Tie government subsidies with service quality attainment

2. Institutional Reforms

- Provide professional management support to BSNL transformation
- Establish regulatory treatment of competitive neutrality
- Promote foreign investment on service infrastructure
- Build competent employees on customer service positions

6.2.4 In the case of BSNL in particular

With the large service quality discontinuities experienced by BSNL, it is recommended to target the following:

1. Imperative Transformation Program

- Introduce partnership with the private sector in serving customers
- Focus on outsourcing non-core activities to concentrate on strategy
- Become agile using independent business units
- Introduce voluntary retirement plans to optimize the workforce

2. Competitive Positioning

- Market on strengths in reliability
- Come up with niche government and rural services
- Liaise with the private operators in terms of upgrading the technologies
- Develop service revamping labs

3. Cultural Revolution

- Employ customer care service specialists in the industry
- Use performance promotions
- Develop employee ownership schemes
- Develop a customer-driven organization structure

6.3 Limitations and Future Research

Though this research is quite informative, the following limitations are to be considered:

1. **Geographic Scope:** The area of focus on Telangana will reduce the scope of generalizability to any other state in India that has an alternative in the market.
2. **Cross-sectional Design:** A single point of time data collection does not allow tracing the progress of service quality
3. **Equal Sampling:** Non-Italianate distribution among operators does not **correspond to real market shares**
4. **Perceptual Measures:** Depending upon the perceptions of the customers, without objective measurement of service

Future studies that tend to mitigate such limitations should aim to:

5. **Longitudinal Studies:** monitor the differences in the service quality over a long time, especially during the implementation of 5G
6. Extend study to more states to cross-analyze Pan-India.
7. **Mixed Methods:** Blend the perceptual measures with service measures on an objective basis
8. **Segment-Specific Research:** Do a deep research about individual customer segments (enterprise, youth, women)
9. **Technology Impact:** Evaluate the expectations of the service quality changes imposed by the general development of technology
10. **International Comparisons:** Compare the quality of services in India as compared to the rest of the world

6.4 Final Thoughts

Indian telecommunication industry is at a crossroads. On one hand, technological infrastructure has been enhanced immensely, but on the other, a big challenge faced has been the quality of the service, threatening to displease the customers and kill the industry. The wide gaps at the cross-sectional and multi-dimensional levels refer to the fact that mere changes in operators and marginal improvements cannot suffice; this needs to be a transformational change.

World-class Telecommunication services are very important to the success of the Digital India policy and the economy of the country. This paper demonstrates that the realization of this vision would necessitate the need to look beyond the network coverage and the network speed, but on the broader aspect of service excellence. The journey requires the collaboration of the operators, regulators, and policymakers to establish a customer-driven telecommunications environment.

The knowledge gained during this study becomes more applicable as India is approaching 5G and beyond. Increase in technology without a similar increment in the quality of the corresponding services is just going to increase the gap between expectation and perception. We need action before it is too late, and this needs to be done now and not later, as digital transformation without good services and quality is likely to hurt the future of India.

The telecommunications industry may turn all these challenges into competitive advantages. Providers, which manage to fill the gaps related to the service quality, will not only attract more satisfied customers but also establish sustainable positions in the market. The direction has been drawn; what we just need now is the determination to implement and turn Indian telecommunications into a service quality reference point rather than a technology success story.

References:

1. Bansal, H. S., & Taylor, S. F. (1999). The service provider switching model (SPSM): A model of consumer switching behavior in the services industry. *Journal of Service Research*, 2(2), 200-218.
2. Bharti Airtel. (2024). Annual report 2023-24. <https://www.airtel.in/about-bharti/equity/annual-reports>
3. Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V. A. (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research*, 30(1), 7-27.
4. Brady, M. K., & Cronin, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: A hierarchical approach. *Journal of Marketing*, 65(3), 34-49.
5. Cronin, J. J., & Taylor, S. A. (1992). Measuring service quality: A reexamination and extension. *Journal of Marketing*, 56(3), 55-68.
6. Dabholkar, P. A., Thorpe, D. I., & Rentz, J. O. (1996). A measure of service quality for retail stores: Scale development and validation. *Journal of the Academy of Marketing Science*, 24(1), 3-16.
7. Deloitte India. (2022). Digital communications in India: Trends and outlook. <https://www2.deloitte.com/in/en/pages/technology-media-and-telecommunications/articles/digital-india.html>
8. Department of Telecommunications (DoT). (2023). Telecom sector performance report. <https://dot.gov.in/reports-statistics/telecom-sector-performance-report>
9. Ernst & Young (EY). (2023). The 5G opportunity in India: A consumer and industry perspective. https://www.ey.com/en_in/tmt/5g-in-india
10. Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18(4), 36-44.
11. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.

12. Indian Brand Equity Foundation (IBEF). (2024). Telecom industry report. <https://www.ibef.org/industry/telecommunications-india-presentation>
13. Kotler, P., & Keller, K. L. (2016). Marketing management (15th ed.). Pearson Education.
14. Kumar, M., Kee, F. T., & Manshor, A. T. (2009). Determining the relative importance of critical factors in delivering service quality of banks: An application of dominance analysis in SERVQUAL model. *Managing Service Quality*, 19(2), 211-228.
15. Kundu, S., & Datta, S. K. (2021). Impact of service quality dimensions on customer satisfaction in telecom sector in India. *International Journal of Services and Operations Management*, 38(2), 271-290.
16. Lovelock, C. H., & Wirtz, J. (2011). Services marketing: People, technology, strategy (7th ed.). Pearson Education.
17. Malik, M. E., Ghafoor, M. M., & Hafiz, K. I. (2012). Impact of brand image, service quality, and price on customer satisfaction in Pakistan telecommunication sector. *International Journal of Business and Social Science*, 3(23), 123-129.
18. Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17(4), 460-469.
19. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41-50.
20. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
21. Reliance Jio Infocomm Ltd. (2023). Quarterly financial results and customer trends. <https://www.jio.com/en-in/investors>
22. Rust, R. T., & Oliver, R. L. (1994). Service quality: Insights and managerial implications from the frontier. In R. T. Rust & R. L. Oliver (Eds.), *Service quality: New directions in theory and practice* (pp. 1-19). Sage Publications.
23. Sekaran, U., & Bougie, R. (2016). Research methods for business: A skill-building approach (7th ed.). Wiley.
24. Seth, N., Deshmukh, S. G., & Vrat, P. (2005). Service quality models: A review. *International Journal of Quality & Reliability Management*, 22(9), 913-949.
25. Sharma, A., & Mehta, M. (2020). A study of customer satisfaction in telecom services using SERVQUAL model. *International Journal of Management Studies*, 7(3), 45-55.
26. Singh, J., & Sirdeshmukh, D. (2000). Agency and trust mechanisms in consumer satisfaction and loyalty judgments. *Journal of the Academy of Marketing Science*, 28(1), 150-167.
27. Srivastava, R. K., & Sharma, D. (2013). Understanding customer satisfaction with service quality in the Indian telecom sector. *Journal of Services Research*, 13(1), 123-142.
28. Sureshchandar, G. S., Rajendran, C., & Kamalanabhan, T. J. (2001). Customer perceptions of service quality: A critique. *Total Quality Management*, 12(1), 111-124.
29. Telecom India Reports. (2023). Indian telecom trends and consumer insights. <https://telecomtalk.info/india-telecom-statistics/>
30. Telecom Regulatory Authority of India (TRAI). (2023). Annual report 2022-23. <https://www.trai.gov.in/about-us/annual-reports>
31. Telecom Regulatory Authority of India (TRAI). (2024). Performance indicators report. <https://www.trai.gov.in/release-publication/reports/performance-indicators-reports>
32. TelecomTalk.info. (2024). Telecom market share in India – Latest subscriber data. <https://telecomtalk.info/category/india-telecom-statistics/>
33. TRAI Consumer Outreach Programme. (2023). Consumer satisfaction survey report. <https://traigov.in/consumer-info/telecom/consumer-education>
34. Vodafone Idea. (2024). Annual report 2023-24. <https://www.myvi.in/investors/annual-reports>
35. Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2006). Services marketing: Integrating customer focus across the firm (4th ed.). McGraw-Hill.