User Issues and Challenges of Telecom Services in Sivagangai District

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Abstract

Purpose: *This study examines the major issues and challenges faced by telecom service users in Sivagangai District, Tamil Nadu, with particular focus on network reliability, billing transparency, and customer service efficiency.* ***Methodology:*** *The study adopts a descriptive research design using both primary and secondary data. Primary data were collected from 100 telecom users through a structured questionnaire. Statistical tools such as Factor Analysis were employed to identify key dimensions of user challenges. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were applied to assess sampling adequacy and correlation strength.* ***Results:*** *The KMO value of 0.588 and significant Bartlett's test ($\chi^2 = 428.376$, $p < 0.05$) confirmed the suitability of factor analysis. The rotated component matrix revealed three major factors: (1) Network-related issues (coverage, call drops, slow internet), (2) Billing and transparency issues (hidden charges, service disruptions), and (3) Customer-related concerns (data privacy, inflexible plans). Network coverage (.917) and data privacy (.915) emerged as the most significant concerns.* ***Conclusion:*** *The findings indicate that technical reliability, transparent billing practices, and customer-centric service improvements are critical for enhancing user satisfaction in rural telecom markets. Strengthening infrastructure, improving service transparency, and offering flexible plans are essential to bridge the rural telecom service gap.*

Keywords: Telecom Services, Rural Connectivity, Network Reliability, Customer Satisfaction, Factor Analysis, Service Quality.

Introduction

Telecommunication services are a vital part of modern society, bridging gaps in communication, enabling access to information, and fostering economic growth. In India, telecom services have seen rapid growth, particularly with the expansion of mobile networks and internet connectivity. However, this progress has not been uniform across all regions. Rural areas like Sivagangai District in Tamil Nadu continue to face significant challenges in accessing reliable and efficient telecom services. Sivagangai District, largely characterized by rural and semi-urban settings, experiences a range of issues when it comes to telecom connectivity. While urban areas have made strides in adopting 4G and even 5G technologies, rural districts often lag behind, relying on outdated networks with limited bandwidth. These challenges not only affect personal communication but also limit access to essential services like online education, healthcare, and government schemes, which increasingly rely on digital platforms.

The purpose of this study is to explore the various issues and challenges faced by telecom users in Sivagangai District. By understanding the limitations in network coverage, infrastructure, service quality, affordability, and digital literacy, this study aims to shed light on the barriers to efficient telecom services in rural regions. Furthermore, it highlights the socio-economic impact of these challenges and the need for policy interventions and technological advancements to bridge the digital divide between rural and urban areas.

Review of Literature

Telecommunication infrastructure is widely recognized as a key driver of socio-economic development, particularly in developing economies. Studies have consistently highlighted the role of mobile connectivity and broadband access in promoting digital inclusion and economic growth.

Roller and Waverman (2001), in their empirical study published in The American Economic Review, established a significant positive relationship between telecommunications infrastructure and economic growth. Their findings suggest that network expansion directly contributes to productivity improvement, especially in emerging economies.

Gruber and Koutroumpis (2011), in Telecommunications Policy, analyzed mobile telecommunications diffusion across countries and found that broadband penetration significantly enhances economic performance. The study emphasized that rural areas benefit substantially when telecom infrastructure is strengthened.

Aker and Mbiti (2010), in their widely cited paper in The Journal of Economic Perspectives, examined the impact of mobile phones in developing countries and concluded that improved telecom access reduces information asymmetry, enhances market efficiency, and improves welfare outcomes, particularly in rural regions.

Sridhar and Sridhar (2007), in Telecommunications Policy, studied telecom infrastructure and economic growth in developing nations and found that policy reforms and competition significantly influence service quality and affordability. Their research indicates that rural telecom expansion requires regulatory support and targeted investments.

Prieger (2013), in Information Economics and Policy, investigated broadband adoption barriers and identified income constraints, digital literacy, and infrastructure gaps as primary challenges in rural areas. The study suggests that affordability and service quality are key determinants of user satisfaction.

The Telecom Regulatory Authority of India (TRAI, 2023) reports that rural tele-density remains lower compared to urban regions, and network quality complaints are more frequent in semi-urban and rural districts. TRAI performance indicators highlight persistent issues related to call drops, data speed, and service transparency.

Katz and Callorda (2018), in Telecommunications Policy, emphasized that digital divide persists despite infrastructure growth, particularly in rural and low-income communities. They argue that policy interventions must combine infrastructure investment with affordability and digital literacy initiatives.

Similarly, Lee, Marcu, and Lee (2011), in Information Economics and Policy, found that broadband quality significantly influences customer satisfaction, and service reliability plays a critical role in retention.

Overall, existing literature establishes that rural telecom challenges are multidimensional, involving infrastructure gaps, affordability constraints, regulatory issues, service transparency, and digital literacy barriers. However, while several macro-level and cross-country studies exist, limited empirical research focuses specifically on district-level telecom user challenges in rural Tamil Nadu. Therefore, this study attempts to fill this gap by providing micro-level evidence from Sivagangai District.

Statement of the Problem

The telecom industry is undergoing rapid transformation, driven by technological advancements like 5G, AI, and cloud computing. However, telecom operators face significant challenges that threaten their ability to meet growing consumer demands and remain competitive. These challenges include complex system integration, scalability issues, and maintaining customer satisfaction in the face of high operational costs and outdated infrastructure.

Furthermore, telecom operators must address the increasing complexity of IoT and machine-to-machine (M2M) billing procedures, while balancing the need for network expansion with efficient use of resources.The problem, therefore, is the telecom industry's struggle to adapt to these rapid technological changes while maintaining operational efficiency, customer satisfaction, and scalability. Without addressing these issues, telecom companies may fail to fully capitalize on opportunities presented by technologies such as 5G, AI, and the metaverse, while facing rising costs and declining customer trust.

Objective of the Study

- To investigate the primary challenges faced by telecom users in Sivagangai District.
- To assess the satisfaction levels of telecom service users in Sivagangai District.

Hypothesis of the Study

1. H_1: Poor network connectivity and unreliable service are major challenges for telecom users in rural areas of Sivagangai District.
2. H_2: Telecom users in Sivagangai District are dissatisfied due to unclear billing, frequent service issues, and poor digital customer support.

Research Methodology

Research Design:

This study will follow a descriptive research design to assess the issues and challenges faced by telecom users in Sivagangai District. Both qualitative and quantitative methods will be employed to gather data from telecom users and evaluate service-related challenges such as network quality, customer satisfaction, and billing transparency.

Data Collection Methods:

Data will be collected through structured questionnaires distributed to telecom users in Sivagangai District and the Secondary Data Existing literature, government reports, and telecom company records will be reviewed to understand the broader trends and challenges in telecom services. A sample size of 100 respondents will be targeted and collection Data. The collected data will be analyzed using both descriptive and inferential statistical methods to identify key challenges and satisfaction levels.

Tools for Analysis:

Factor Analysis

Analysis based Socio Economic Condition

Variables	Characteristics	Respondents in percentage
Gender	Male	45
	Female	55
	Total	100
AGE	BELOW 25	28
	26-35	21
	36-45	30
	46-55	14
	ABOVE56	7
	Total	100
Educational qualification	S.S.L.C	12
	H.S	14
	U.G	38
	P.G	22
	DIPLAMO	14
	Total	100
Income of the Family	BELOW 20,000	3
	20,001-40,000	32
	40,001-60,000	46
	60,001-80,000	14
	ABOVE 80,001	3
	Total	100
Family Size	BELOW 3	16
	4-6	64
	ABOVE 6	20
	Total	100

Inference :The demographic data of the respondents reveals diverse characteristics across key variables. Regarding gender, the sample comprises 55% females and 45% males, indicating a slightly higher representation of women. Age-wise, the largest group of respondents falls in the 36–45 age bracket (30%), followed by those below 25 years (28%), while the least represented

are individuals above 56 years (7%). In terms of educational qualifications, a substantial proportion has completed undergraduate studies (38%), followed by postgraduate qualifications (22%), whereas only 12% have S.S.L.C. as their highest qualification. Family income shows a concentration in the middle-income groups, with 46% earning ₹40,001–60,000 and 32% earning ₹20,001–40,000, while incomes below ₹20,000 and above ₹80,000 account for just 3% each. Family size predominantly ranges between 4–6 members (64%), with smaller families (below three members) constituting 16%, and larger families (above six members) at 20%. These insights collectively underscore a sample profile marked by a balanced gender distribution, middle-aged predominance, moderate to high educational qualifications, mid-level family income, and medium-sized households.

KMO and Bartlett's Test

Table 1

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.588
Bartlett's Test of Sphericity	Approx. Chi-Square	428.376
	Df	45
	Sig.	.000

The value of KMO should be close to 0.5 for a satisfactory factor analysis to proceed. The value of the test statistic is given in Table 1 as 0.588 which means the factor analysis for the selected variables is found to be appropriate to the data.

Bartlett's test is another indication of the strength of the relationship among variables. This test tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is a matrix in which all of the diagonal elements are close to 0. From the Table, Bartlett's Test of Sphericity test value is 428.376 at Degrees of freedom 45. That significant level is less than 0.05. It is 0.000, i.e. the significance level is small enough to reject the null hypothesis ($p<0.05$). This means that the correlation matrix is not an identity matrix (there exists' correlations between the variables).

Rotated Component Matrix

Table 2

	Component		
	1	2	3
Network Coverage Issues	.917		
Call Drops and Poor Call Quality	.765		
Slow Internet Speeds	.744		
Lack of Value-Added Services.	.703		
High Billing	.673		
Customer Support Inefficiency	.651		
Hidden Charges and Transparency Issues		.904	
Service Disruptions.		.737	
Data Privacy and Security Concerns			.915
Inflexible Plans			.737

Inference

The component analysis reveals three primary groupings of challenges faced by telecom users. Component 1 is dominated by network-related issues, including network coverage (.917), call quality (.765), and internet speed (.744), emphasizing technical service reliability. Component 2 highlights billing and service transparency concerns, with hidden charges (.904) and service disruptions (.737) as key factors. Component 3 focuses on customer-specific concerns, including data privacy (.915) and inflexible plans (.737), pointing to personalization and trust issues. These clusters suggest distinct focus areas for telecom providers to address for improved user satisfaction.

Suggestions and Policy Implications

Based on the findings of the factor analysis and user responses, the following suggestions are proposed:

Strengthening Network Infrastructure

Telecom providers should increase the number of telecom towers in rural and semi-urban areas of Sivagangai District to reduce call drops and improve

internet speed. Investment in 4G/5G network expansion should be prioritized in underserved villages.

Improving Service Quality Monitoring

Regular network performance audits should be conducted to ensure consistent service reliability. Telecom companies must adopt advanced monitoring tools to reduce service disruptions.

Enhancing Billing Transparency

Clear and simplified billing statements should be provided to customers to eliminate hidden charges. Customer awareness campaigns should educate users about tariff plans and data usage.

Strengthening Customer Support Systems

Local service centers and responsive digital customer support platforms should be established in rural areas. Faster grievance redressal mechanisms must be implemented.

Flexible and Affordable Service Plans

Telecom operators should introduce customized low-cost plans tailored for rural users. Flexible prepaid options and data rollover facilities may enhance user satisfaction.

Promoting Digital Literacy

Government and telecom companies should collaborate to conduct digital literacy programs to improve effective usage of telecom and internet services in rural communities.

These measures can significantly enhance telecom service satisfaction and bridge the rural–urban digital divide.

Future Research Directions

Although this study provides insights into telecom user challenges in Sivagangai District, several areas require further investigation:

1. Future studies may expand the sample size to include multiple districts for comparative regional analysis.
2. Longitudinal research can be conducted to examine changes in user satisfaction after infrastructure improvements.
3. Further research may apply advanced statistical tools such as Structural Equation Modeling (SEM) to examine causal relationships between service quality and customer satisfaction.
4. A comparative study between public and private telecom operators can provide deeper insights into performance variations.
5. Future studies may also explore the impact of emerging technologies such as 5G and AI-based customer service systems in rural telecom markets.

These research extensions will contribute to broader policy formulation and sustainable telecom development strategies.

Limitations of the Study

This study has certain limitations that should be acknowledged. The research is based on a relatively small sample size of 100 respondents, which may not fully represent the entire telecom user population of Sivagangai District. Since the study is geographically confined to a single district, the findings cannot be generalized to other regions without caution. The data were collected at a single point in time, making the study cross-sectional in nature and limiting the ability to assess changes in user perceptions over time. Additionally, the analysis relies on self-reported responses, which may be subject to personal bias or response errors. The statistical analysis is limited primarily to descriptive statistics and factor analysis, and more advanced analytical techniques could provide deeper insights. These limitations should be considered when interpreting the results of the study.

Conclusion

The analysis provides valuable insights into the socio-economic conditions and challenges faced by telecom users, forming a comprehensive understanding of their profile and concerns. The demographic data indicate a balanced representation of genders, with a slight predominance of females, a middle-aged majority, moderate to high levels of education, and incomes concentrated in the middle brackets. Most households are medium-sized, comprising 4–6 members. The factor analysis further identifies three distinct areas of user challenges:

network-related issues, including coverage, call quality, and internet speed, which emphasize the need for improved technical reliability; billing and service transparency concerns, such as hidden charges and service disruptions, which call for clearer communication and consistent service; and customer-specific concerns, including data privacy and plan flexibility, pointing to a demand for trust-building measures and personalized solutions. These insights collectively highlight the critical areas telecom providers must address to enhance user satisfaction and meet diverse customer expectations effectively.

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