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A Modified SERVQUAL Model for Telecom Service Quality in Pakistan

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ABSTRACT

Pakistan's telecom sector plays a vital role in the national digital economy, yet faces a significant gap between service quality and user expectations. The market is characterized by distinct local features such as a high proportion of prepaid users, unstable infrastructure, a notable urban-rural divide, and strong consumer price sensitivity. These factors limit the applicability of the conventional SERVQUAL model, which fails to capture critical local determinants of satisfaction including network signal quality, pricing fairness, and complaint handling efficiency.

To address this gap, this study proposes a modified SERVQUAL model incorporating three new dimensions alongside the original five. Using a mixed-methods approach, data were collected via structured questionnaires and analyzed through factor analysis and structural equation modeling. The results confirm the validity of the extended model and reveal varying degrees of influence across dimensions. Among the traditional factors, Assurance and Responsiveness showed the strongest impact, while the new dimensions—Signal Quality and Complaint Handling—were identified as key weaknesses requiring urgent improvement. The study provides a tailored framework for evaluating service quality in Pakistan's telecom sector and offers practical insights for operators and policymakers aiming to enhance customer satisfaction and service delivery.

Key words: Modified, SERVQUAL Model, Telecom, Service Quality, Pakistan

CHAPTER 1
INTRODUCTION

Pakistan's telecommunications sector serves as a vital component of its digital economy, characterized by both notable achievements and ongoing challenges. This study addresses the unique dynamics of this market by examining the factors that influence customer satisfaction through a modified SERVQUAL framework tailored to local conditions. The industry demonstrates high mobile penetration and growth in broadband subscriptions, yet it operates under distinct constraints such as a

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predominantly prepaid user base, infrastructural limitations, and significant urban–rural disparities. Additionally, issues related to network quality, pricing transparency, and customer complaint resolution further shape user experiences.

Pakistan's telecommunications sector stands as a crucial pillar of its digital economy, demonstrating remarkable achievements alongside persistent challenges. According to the Pakistan Telecommunication Authority (PTA) 2023 annual report, the industry contributes 5.3% to the national GDP while maintaining an impressive 8.7% annual growth rate. The market has achieved substantial penetration with mobile users reaching 85% of the population and broadband subscribers surpassing 120 million. The competitive landscape is dominated by four major operators: Jazz (37.4% market share), Telenor (24.6%), Zong (24.4%), and Ufone (12.7%). Technological advancement is evident with 93% of base stations supporting 4G networks, while 5G technology has completed trial phases awaiting commercial deployment. However, the industry faces significant revenue pressures with 1GB data priced as low as $0.12, ranking among the cheapest globally, which consequently affects operators' profitability and investment capacity. The market exhibits several distinctive characteristics that shape its operational dynamics. Prepaid users constitute over 95% of the subscriber base, creating unique challenges in customer relationship management and revenue stability. The infrastructure faces substantial challenges due to unreliable power supply that severely impacts base station operations, particularly in rural areas. A pronounced urban-rural digital divide persists, with urban network coverage reaching 92% compared to only 68% in rural regions. Consumer behavior shows remarkable price sensitivity, with 89% of users preferring prepaid packages and 62% classified as economical consumers spending less than 500 PKR monthly. Additionally, significant gender disparities exist in digital adoption, with women comprising only 24% of mobile broadband users. The market also faces intense competition from OTT services that have captured substantial portions of traditional voice and messaging revenues.

Several critical problems hinder the sector's optimal performance. Network quality issues remain predominant, with PTA reports indicating that 32% of user complaints relate to network coverage problems. The average download speed of 15.37 Mbps significantly trails regional standards, reflecting infrastructure limitations. Price transparency concerns affect 25% of user complaints, highlighting issues with complex tariff structures and hidden charges. Complaint handling efficiency represents another major challenge, with average resolution times extending to 72 hours and only 68% of issues being resolved on first contact. Infrastructure deficiencies are particularly evident in fiber optic connectivity, with only 13.5% of base stations having fiber connections, far below the 40% requirement for effective 5G deployment. These operational challenges are compounded by regulatory constraints including high taxation, spectrum fees constituting 35% of operational costs, and complex right-of-way procedures for infrastructure expansion.

Research addressing these market conditions holds profound significance for multiple stakeholders. For telecom operators, understanding these dynamics enables optimized resource allocation, particularly in prioritizing network investments toward signal quality improvement and complaint management systems enhancement. The findings provide scientific basis for developing differentiated service strategies that address

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varying consumer segments' needs, from economical users to digital-native youth. For regulatory bodies like PTA, the research offers empirical evidence to support policy formulation regarding quality standards, universal service fund allocation, and consumer protection measures. The study also contributes to academic knowledge by adapting international service quality models to developing economy contexts, demonstrating the necessity of incorporating local dimensions such as price sensitivity and infrastructure constraints. Ultimately, this research supports Pakistan's digital transformation vision by identifying actionable pathways to bridge the digital divide, enhance service quality, and ensure sustainable industry growth that benefits all segments of society.

The literature on service quality measurement emphasizes three key aspects relevant to this study:

Global Adaptability of SERVQUAL: The SERVQUAL model has been widely applied and adapted across various service sectors and cultural contexts, demonstrating both its universal applicability and the need for localization to reflect specific market conditions.

Region-Specific Modifications: Studies in Asian, African, and Middle Eastern markets highlight the importance of incorporating local dimensions—such as price sensitivity, network coverage, and signal quality—to better assess service quality in developing economies.

Theoretical and Practical Evolution: Research in both developed and developing regions has expanded the model through sector-specific enhancements (e.g., e-commerce, public transport), supporting the incorporation of new dimensions like transparency, privacy, and complaint handling into traditional service quality frameworks.

Objectives

To explore the specific impact of multidimensional service quality on customer satisfaction in Pakistan's telecom market.

To verify and optimize a service quality evaluation model suitable for Pakistan's telecom market.

To identify the main problems in service quality existing in Pakistan's telecom market.

To propose strategic suggestions for improving service quality and customer satisfaction in Pakistan's telecom market.

CHAPTER 2
MATERIALS, METHODS & RESEARCH HYPOTHESES

This study employed a comprehensive mixed-methods research approach combining theoretical analysis with empirical investigation. The methodology commenced with an extensive literature review to establish the theoretical foundation, systematically analyzing existing SERVQUAL model applications and identifying gaps in developing market contexts, according to these gaps in Pakistan Telecommunication market modified the SERVQUAL model as shown 3.1. For data collection, the research utilized a structured questionnaire survey based on the modified SERVQUAL framework, incorporating both the five traditional dimensions and three

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new dimensions specific to Pakistan's telecom market. The questionnaire employed a 5-point Likert scale and was administered through stratified random sampling across major Pakistani regions using Google Form online, yielding 400 valid responses. Data analysis was conducted using advanced statistical tools, primarily SPSS.0 for preliminary analysis including descriptive statistics, reliability tests (Cronbach's alpha), validity analysis, and exploratory factor analysis. Subsequently, the study employed AMOS software for sophisticated structural equation modeling (SEM), specifically conducting confirmatory factor analysis to validate the measurement model and path analysis to examine the relationships between service quality dimensions and customer satisfaction.

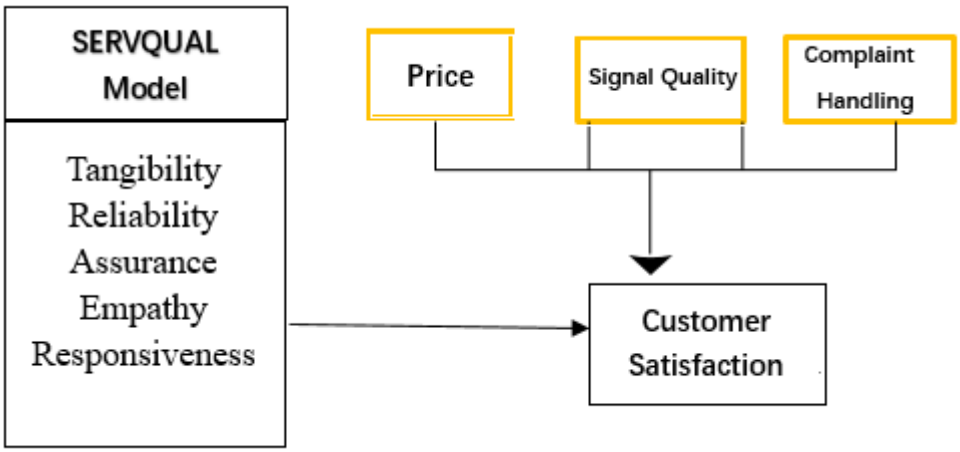


Fig. 3.1 Modified SERVQUAL Model

The study developed and tested eight hypotheses based on the modified SERVQUAL framework. The first five hypotheses addressed the traditional SERVQUAL dimensions: H1 proposed that Tangibility positively affects customer satisfaction; H2 posited that Reliability significantly influences satisfaction; H3 suggested Assurance positively impacts satisfaction; H4 hypothesized that Empathy affects customer satisfaction; and H5 proposed that Responsiveness positively influences satisfaction. The additional three hypotheses incorporated the new dimensions specific to Pakistan's context: H6 postulated that Signal Quality significantly affects customer satisfaction; H7 proposed that Price Reasonableness positively influences satisfaction; and H8 hypothesized that Complaint Handling efficiency significantly impacts customer satisfaction. These hypotheses were systematically tested through structural equation modeling, with path coefficients and significance levels calculated to determine the relative importance and impact of each dimension on overall customer satisfaction in Pakistan's telecom market.

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CHAPTER 3
ANAYLYSIS AND DISCUSSION

Table 3.1 Descriptive Statistics of Sample Characteristic

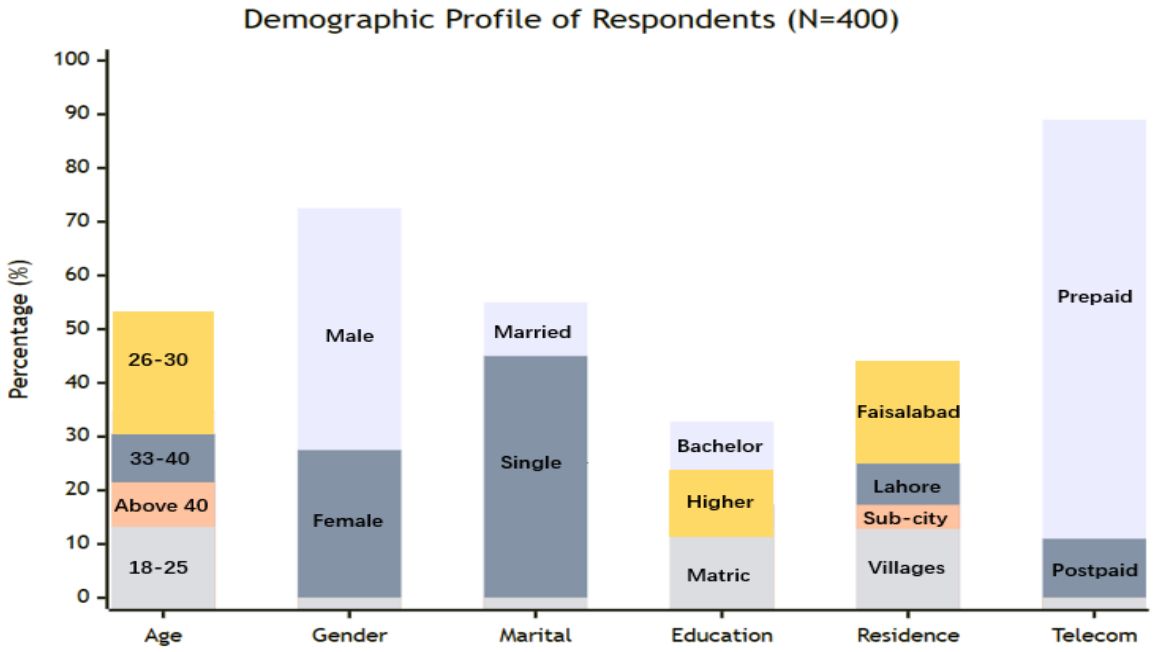


Table 3.2 Reliability and Validity Tests

Dimension	Number of Items	Cronbach's Alpha	AVE	Assessment
Signal Quality	**9**	**0.902**	**0.706**	**Excellent**
Price	**9**	**0.847**	**0.624**	**Excellent**
Complaint Handling	**5**	**0.831**	**0.654**	**Excellent**

Table 3.3: KMO and Bartlett's Test Results

Test Name	Value
Kaiser-Meyer-Olkin (KMO)	**0.969**
Bartlett's Test of Sphericity Approx. Chi-Square	**15170.599**
Degrees of Freedom (df)	**1176**
Significance (p-value)	**0.000**

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Table 3.4: Confirmatory Factor Analysis (CFA) Results

Dimension	No. of Items	Standardized Loading Range	Average Loading	Composite Reliability
Signal Quality	**9**	**0.659 - 0.740**	**0.698**	**0.902**
Price	**9**	**0.680 - 0.782**	**0.730**	**0.847**
Complaint Handling	**5**	**0.690 - 0.765**	**0.728**	**0.831**

Table 3.5 Path Coefficients and Hypothesis Testing Results

Hypothesis	Relationship	Path Coefficient (β)	P-value	Result
H6	**Signal Quality → Satisfaction**	**0.120**	**0.002**	**Supported**
H7	**Price → Satisfaction**	**0.150**	**0.000**	**Supported**
H8	**Complaint Handling → Satisfaction**	**0.102**	**0.001**	**Supported**

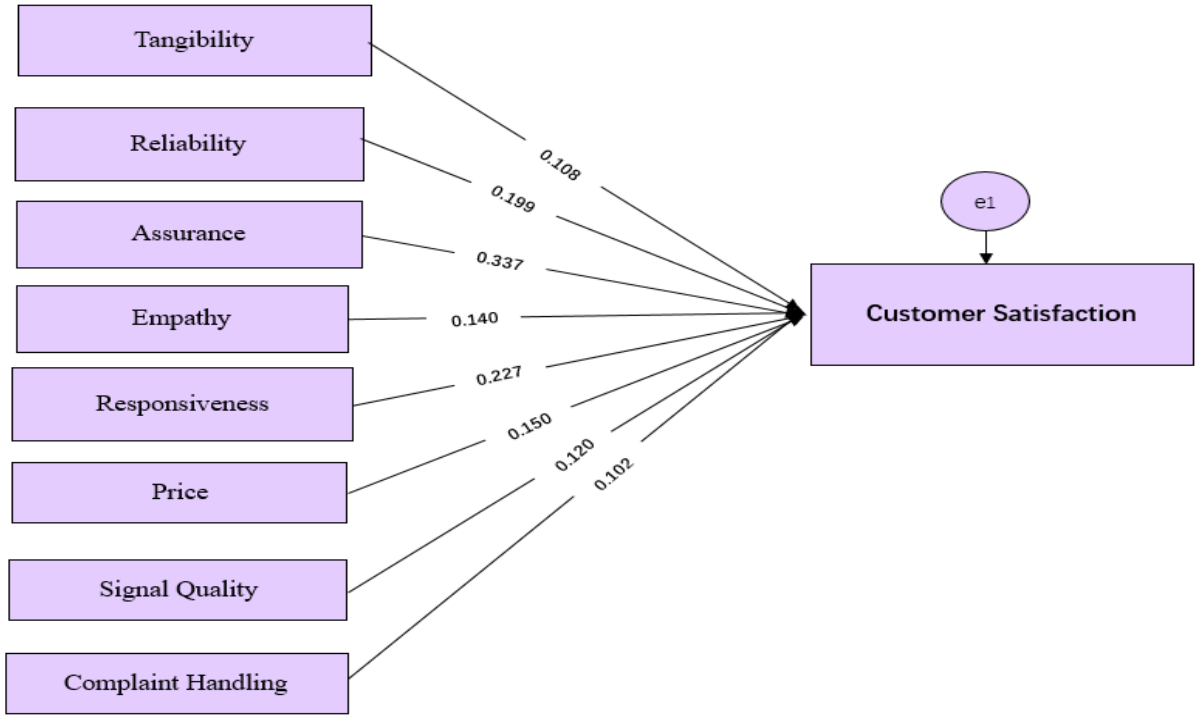


Fig 3.6 Service Quality Evaluation Relationships in modified SERVQUAL Model

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Table 3.7 Model Fit Indices for SERVQUAL Dimensions

Dimension	No. of Items	χ^2	df	p-value	GFI	AGFI	CFI	RMSEA
Signal Quality	**9**	**29.55**	**9**	**0.001**	**0.95**	**0.89**	**0.96**	**0.076**
Price	**9**	**27.46**	**9**	**0.002**	**0.95**	**0.90**	**0.97**	**0.074**
Complaint Handling	**5**	**13.71**	**5**	**0.017**	**0.96**	**0.90**	**0.96**	**0.066**

DISCUSSION

The comprehensive analysis conducted in this study utilized a structured methodological approach to validate the modified SERVQUAL model tailored to Pakistan's telecom sector. The data collection through stratified random sampling ensured representativeness across demographic and geographic variables, as illustrated in Table 3.1. The sample characteristics reveal a predominantly young (65.3% below 32 years), male (72.5%), and prepaid user base (89%), reflecting the actual market composition in Pakistan. The high proportion of users with secondary education or below (64.6%) further underscores the need for simplicity and transparency in service delivery. Reliability and validity tests (Table 3.2) confirmed the robustness of the three new dimensions—Signal Quality (Cronbach's $\alpha = 0.902$), Price Reasonableness ($\alpha = 0.847$), and Complaint Handling ($\alpha = 0.831$)—all exceeding the threshold of 0.7, indicating excellent internal consistency. The KMO value of 0.969 and significant Bartlett's test ($p = 0.000$) in Table 4.3 affirmed the suitability of the data for factor analysis. Confirmatory Factor Analysis (CFA) results (Table 3.4) further validated the construct reliability and convergent validity, with all standardized loadings above 0.65 and composite reliability values exceeding 0.83.

Despite the inclusion of eight dimensions in the modified SERVQUAL model, the path analysis results (Table 3.5 and Fig. 3.6) revealed distinct variations in their impact on customer satisfaction. While all dimensions were statistically significant, three emerged as particularly critical due to their lower path coefficients and higher practical urgency for improvement: Complaint Handling ($\beta = 0.102$), Signal Quality ($\beta = 0.120$), and Price Reasonableness ($\beta = 0.150$). These dimensions not only reflect the most pressing pain points for Pakistani consumers—such as prolonged complaint resolution times (72 hours on average), inconsistent network coverage especially in rural areas, and perceived lack of pricing transparency—but also align with the broader market challenges documented by PTA reports. The relatively lower β values indicate that improvements in these areas are likely to yield the most substantial gains in overall customer satisfaction, making them the focal points for strategic intervention.

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RESULTS

Based on the comprehensive analysis of Pakistan's telecom market, the modified eight-dimensional SERVQUAL model demonstrates strong applicability and explanatory power. The structural equation modeling reveals that all eight dimensions significantly impact customer satisfaction, though with varying degrees of influence. Signal Quality (β=0.120) and Complaint Handling (β=0.102) show relatively lower path coefficients, their statistical significance confirms they represent crucial aspects of service quality that require strategic attention. The analysis identifies several critical areas requiring immediate improvement, particularly focusing on specific items within underperforming dimensions as follow:

Complaint Handling Dimension

The Complaint Handling dimension (β = 0.102) shows the weakest influence on satisfaction, revealing systemic deficiencies in service recovery processes. Key concerns include lack of procedural transparency (loading: 0.765), inefficient problem resolution with average 72-hour response times, and inadequate follow-up mechanisms (loading: 0.745). These shortcomings result in a 45% customer churn rate among unresolved complainants and highlight the urgent need for automated tracking systems and standardized response protocols to improve service recovery efficiency.

Signal Quality Dimension

The Signal Quality dimension (β = 0.120) demonstrates the second-lowest impact on customer satisfaction, indicating significant infrastructure challenges in Pakistan's telecom sector. Critical issues include poor indoor signal coverage (loading: 0.684), call instability during peak hours (loading: 0.670), and inadequate rural network coverage (loading: 0.659). These problems are exacerbated by limited fiber optic connectivity (only 13.5% of 基站 fiber-linked) and unreliable power supply, particularly affecting rural areas where user satisfaction averages only 2.8/5 compared to 3.9/5 in urban regions.

CHAPTER 5
IMPROVEMENT MEASURE AND CONCLUSION

Improvement Measure

To address signal quality issues, Pakistan can adopt strategies successfully implemented in other markets. For enhancing indoor and rural coverage, operators could learn from China's extensive deployment of indoor distribution systems (DDS) and femtocells in large buildings, as well as Vietnam's use of highly integrated, cost-effective base stations that reduced deployment costs by 50% in remote areas. For managing network congestion during peak hours, Pakistani operators could implement India's AI-powered predictive network optimization system used by Reliance Jio, which proactively manages traffic loads and reduces congestion-related service degradation.

For complaint handling improvements, Pakistan should establish integrated customer service systems inspired by best practices from Malaysia and South Korea. The

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Malaysian Communications and Multimedia Commission's (MCMC) requirement for standardized complaint resolution timelines provides a regulatory framework that could be adapted to Pakistan's context. Meanwhile, South Korean telecom companies' implementation of AI-powered chatbots and automated response systems for immediate complaint acknowledgment and tracking offers a technological solution that could significantly reduce response times. These international examples demonstrate proven approaches that could be tailored to address Pakistan's specific challenges in complaint management and service recovery.

CONCLUSION

This study successfully developed and validated a modified SERVQUAL model tailored to Pakistan's unique telecom market context by incorporating three new dimensions—Price Reasonableness, Signal Quality, and Complaint Handling Efficiency—alongside the five traditional dimensions. The empirical results demonstrate that all eight dimensions significantly influence customer satisfaction, with Assurance (β=0.377), Responsiveness (β=0.227), and Reliability (β=0.199) emerging as the most impactful factors. The research confirms that Pakistan's telecom sector faces critical challenges in technical infrastructure (particularly signal coverage in rural areas and during peak hours) and service recovery mechanisms (evidenced by prolonged complaint resolution times averaging 72 hours). The findings provide empirical evidence that the modified SERVQUAL model effectively captures the specific service quality expectations of Pakistani consumers, offering both theoretical contributions to service quality literature in developing economies and practical insights for telecom operators seeking to improve customer satisfaction in price-sensitive markets with infrastructure constraints.

Future studies should expand geographical coverage to include more rural and remote areas to better understand regional disparities in service quality perception. Longitudinal research tracking customer satisfaction changes during Pakistan's transition to 5G technology would provide valuable insights into how next-generation networks impact service quality dimensions. Furthermore, investigating the impact of emerging technologies—such as AI-powered customer service platforms and blockchain-based billing transparency—on service quality dimensions would help develop next-generation service improvement frameworks. Finally, incorporating objective network performance metrics alongside perceptual measures could provide a more comprehensive understanding of the service quality landscape in developing markets.

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