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A Study of Customer Satisfaction Towards 4G Services in India

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ABSTRACT

This preliminary research explores customer satisfaction of 4G service provided in Delhi NCR and UP West region of India with reference to different service quality per se network performance, customer service and pricing. The study with the aid of a questionnaire attempts to test the interrelationship between the expectations and perceptions of the customers, based on the applications of the Expectancy Disconfirmation Theory (EDT) and the SERVQUAL model. Results indicate that network performance and customer service have a significant impact on customer satisfaction and the influence differs in urban and rural areas. Key descriptive statistics show overall satisfaction with differences in quality of care. There was a major service issue found in multiple semi urban and rural areas which showcase service expectations and service perceptions of consumers were clearly not met. During the research, negative disconfirmation was also experienced in rural areas in where the network failure was observed. Through the research, a clear picture regarding customer satisfaction towards 4G services in different parts of India was clearly identified. This study can be further extended to involve geographic discount and qualitative research, to explore the effect of 5G service on customer satisfaction.

Keywords: Customer Satisfaction, 4G Services, Telecom Industry, Service Quality, Network Performance, Customer Service, Gap Analysis,

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Expectancy Disconfirmation Theory, SERVQUAL Model, Regional Differences, Delhi NCR, UP West, Telecom Operators, Customer Loyalty, 5G Impact, Pricing Strategies, Pilot Study, Quantitative Research, Telecom Infrastructure, India.

Introduction

The rapid development of mobile communications technology has been changing the landscape of the telecom industry globally and the advent of 4G technology is seen as a major milestone in this progress. India, second largest telecom market in the world, has had its 4G networks reach every nook and cranny in the country, thanks largely to Airtel, Vodafone-Idea and Jio who have placed their networks deep in rural parts, or end of the road towns and villages. Although these services have diffused into the market quite rapidly, customer satisfaction with these services is increasingly becoming an area of concern particularly in a highly competitive Indian telecom-commerce.

The deliberation on the Delhi NCT and the UP West, being the biggest NCR and the most urban/rural combined region, is vital to evaluate satisfaction of customers on 4Gs services. Telecom infrastructure in Delhi NCR is robust and has good seamless connectivity, high speed, while UP West is a mix of large urban towns and considerable rural hinterland, areas 4G penetration and customer preference accordingly varies. 4G services customer experience in these areas will prove a major retention and loyalty factor in a fierce spectrum race between operators. It's time for telecom providers to make sure that their products are fitting with the needs of the customers in the region, varying among demographic sections.

Although there has been a wide range of literature written in an Indian background on customer satisfaction concerning 3G, and a number of local surveys related to a specific telecom operator, but yet there is insufficiency of such kinds of studies covering the customer satisfaction towards the 4G. Majority of the literature until now has been on limited geographical environments/smaller single operator focused which has led to gap in the study in terms of comparative satisfaction: Multiple operators and larger region covering:- Delhi NCR and UP West. Additionally, the relationship between the service quality dimensions (i.e., network performance, customer service and price-based charges) and customer satisfaction has not been well studied in the context of these two regions.

To fill this gap, this pilot project is carried out to examine customer satisfaction with 4G services in the Delhi NCR, and UP West circles. The purpose of this study is to attempt to identify the core factors of the relationship

between the underlying importance of specified nodes of network quality, call quality, customer service, pricing and customer satisfaction, and show how these affect customer loyalty. This launch is set to boost 4G services for our member mobile operators and help them focus on customer retention in these critical areas. This is an effort to offer realistic implications for dynamic research and industry practice seeking to achieve customer satisfaction in the dynamic 4G telecom market.

Literature Review

Customer Satisfaction in Telecom

The companies in the telecom business who really thrive in the future will be the ones who give customers what they've come to expect, and want, from generation of tech-savvy consumers. The literature, on the other hand describes theories of customer satisfaction that tend to emphasize the gap between the expectation and perception of service performance. One of the mostly cited is the expectancy disconfirmation theory EDT that builds on the suggestion that the perception of service performance is determined by the level of satisfaction with regard to what is expected. This model is enforced by the idea that when service performance is equal or exceeds quality expectations, consumers are satisfied but where performance is below, consumers are dissatisfied. This implies that handling the customer from the other end does not increase satisfaction (Afroza et al. 2025). Price, quality, and network quality, thus play an essential role for telecommunication customer satisfaction level.

The SERVQUAL model can be applied in my subject to measure the quality of service on the five dimensions of service quality i.e. tangibility, reliability, responsiveness, assurance, and empathy, one which are all quality that affect how the consumers take the service. In the relatively well developed telecoms industry, quality is primarily of concern where else the remaining parts include the assuring and gratifying factors. The other model which could fit in the telecom arena is the customer satisfaction index model – CSI-acknowledges the quality of the service with added dimensions for the price and customer service and total user experience. In highly competitive telecoms, this is an important factor in getting loyalty and retention (Choudhury, 2021). Telecoms-related satisfaction theories suggest that satisfied customers are loyal, remain in existing network organizations, and generate positive word-of-mouth, all which are applicable for a general band of communicative behavior. These theories insist that service quality and the improvement process is ultimately important for long-term customer satisfaction.

Service Quality Attributes

Network Performance

Network performance is one of the most vital factors at the present moment in the industry mainly because of the introduction of multiple competing organisations as well as drop in tariff rates. The speed of the services provided by the telecommunication companies enables the stream speed of multiple applications as well as videos and impact the satisfaction levels of the consumers. More the data rates, better the user-experience and the users are satisfied with the quality of the information, more especially, when he feels that services are faster and smoother.

The network coverage is also a significant point to be considerate regarding a good network performance as people even use their phone in small towns, not only in big cities. Moreover, the calling services is one of the most important performance factors that enhance consumer satisfaction levels. Dropped Calls, low quality of voice and delay have a substantial adverse impact on users experience and thus voice quality as a network performance parameter could not be ignored (Kohli and Singh, 2021).

The end user experience for telecom services in general really just comes down to these parts anyway, and if network operators want to give the end user a good "experience" then they are going to have to put more down on their core infrastructure. Networks like the one's Comcast provides are no longer monopolistic rat-mazes with small red doors—it must keep consumers satisfied and dedicated, whether they want to be or not. Companies that offer good service on the network can hold onto the consumers that come with a little bit of stickiness that their wireless connection gives them around their personal and professional and internets, which are increasingly the same things.

Customer Service

Telecommunication market is competitive and the quality of service is a critical factor to determine the satisfaction of customers. In a sector that can at times be susceptible to technical problems and system outages - a rapid response is crucial in getting customers back up and running. They want quick responses to their questions, whether they involve network problems, billing questions or account management issues. Telecommunications companies that are about to decrease the time to resolution whether in the call centre or online or on social channels will go on to provide more satisfied customers. Empathy still has a place in customer service as much as outside it. Empathy can make a customer feel that they customer relationship with the firm is trustworthy (Mohanty et al. 2021).

The other big dimension of customer service in the telecoms world is assurance. Customers want to know they can rely on the business to take care of their problems, and that perception of ease and professionalism is satisfying in and of itself." It's a good business, and the businesses whose customer service reps say pleasantries bring everyone good results in the end have higher returning customers. In a market it's "services" which have been the currency of the realm and that's what has enabled telecoms companies to generate service that puts them first in the minds of their customers.

Customer Loyalty and Retention

For telecom, customer satisfaction is the major driver for both loyalty and retention. Happy clients are more likely to stay with their current providers which means they tend to churn less and are more likely to be loyal customers. The relationship between satisfaction and loyalty is particularly significant in the telecom industry, which is much competitive and where it is easier for customers to switch service providers. There is less of a chance value-seeking and customers will leave your brand when they are satisfied with the quality of your service, network performance, customer service and rates, even as new promotions or technology goes to market.

Customer retention is an effect of satisfaction, since contented customers are likely to be brand loyal. And when telecom operators met / exceeded expectations, they were able to retain customers at a higher rate. This is particularly so in heavily contestable markets, where the switching costs between providers are low (Vevere et al. 2024). A customer who has gone through the retention stage is not only more inclined to maintain using the service, but they are also more likely to refer the provider in the future, which can create a powerful word-of-mouth effect and increase brand loyalty.

In addition, loyal customers are more likely to participate in loyalty programs, upgrade to higher-level service, and refer other customers, which advantageously impacts the financial and market reputation of telecom providers (Kumar, 2023). That is why the telecom businesses are struggling to maintain higher customer satisfaction levels by offering good quality services, responding to the service issues and competitively pricing plans, which in turn, determines customer loyalty and retention.

Marketing Implications

Marketing is one of the most vital aspects in the business sector as it allows the companies to focus on the awareness of their services and they are also able to reach the root level customers through the process. With respect to this research, marketing has huge implications as the companies operating in the

telecommunication sector run mainly on customer awareness and sales. Once the new services of the companies are launched, an immediate marketing plan is required so that awareness about the service can be created among the consumers and the sales of the new service can be enhanced. Moreover, with the help of marketing the companies are also able to reduce competitors in the market as the consumers are able to compare multiple facilities that are being provided by different companies and accordingly they are able to choose the products that provides them with better benefits. Moreover, in case of 4G services, marketing is necessary as the people are to be made aware of the technologies and the speed with which they will be able to operate their internet services, which shall be a huge boost for people in India, as the country is developing presently and internet is one of the main sources of growth within the country.

Methodology

Frameworks and Hypothesis

A service quality, and customer satisfaction model will be applied to the telecommunication companies as the theoretical frameworks; SERVQUAL Model and Expectancy Disconfirmation Theory (EDT). Objectives These frameworks will provide insights into how service quality dimensions affect customer satisfaction and in turn, customer loyalty.

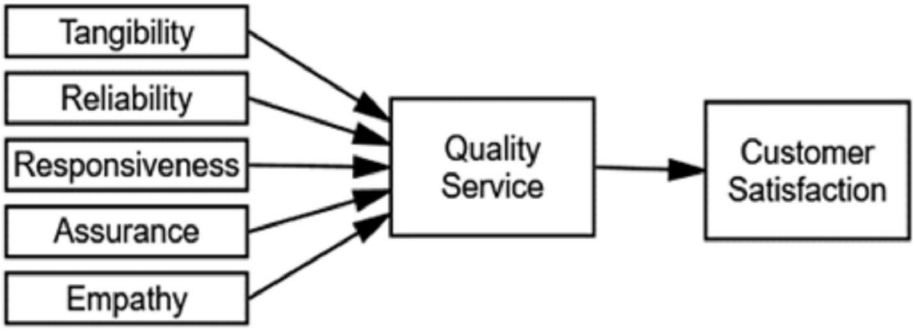

Figure 1: SERVQUAL Model

(Source: influenced by Choudhury, 2021)

The SERVQUAL Model formulated by Parasuraman, Zeithaml, and Berry is a well-known method to measure service quality in service industry including telecom. It measures five vital constructs: reliability, responsiveness, assurance, empathy, and tangibles. In the case of 4G telecom services, the model would assist in determining network uptime, speed and customer response time, service time and customer experience. The SERVQUAL model will only

detect in which types of services the characteristics of quality have an effect on consumer satisfaction and may provide some information concerning the characteristics that are most important to develop in service provision, based on the measuring the variables in the dimensions of the scale.

Figure 2: Expectancy Disconfirmation Theory (EDT)

(Source: influenced from Vevere et al. 2024)

The Expectancy Disconfirmation Theory (EDT), however, it posits that customer satisfaction is based on the perception of the extent of service performance compared to what was expected. Under this theory, consumers have expectations about service based on past experience, advertising, and word of mouth. When the service surpasses these expectations, satisfaction occurs; when it fails to meet them, dissatisfaction exists. For the telecom sector, it will offer the opportunity to analyze how well telecoms are meeting customer needs in the areas of network performance/quality, call quality and customer service (Agarwal et al. 2021).

These model combinations will cover the landscape over all aspects of service quality and satisfaction for the telecommunication sector, and will contribute in recognizing significant parameters to customer loyalty and retention. SERVQUAL and Expectancy Disconfirmation Theory (EDT) are complementary models that together provide a robust framework for understanding customer satisfaction in the telecom sector. SERVQUAL focuses on service quality dimensions, including reliability, responsiveness, assurance, empathy, and tangibles. It allows researchers to evaluate the gap between customer expectations and perceived service performance across these dimensions, which is particularly relevant in telecom services where technical performance, responsiveness, and customer support are critical.

Hypotheses of the Study

Based on the research objectives, the following hypotheses will guide the investigation into customer satisfaction and service quality in the telecom sector, particularly in the Delhi NCR and UP West regions:

H_1: Higher network performance is positively correlated with higher customer satisfaction in the Delhi NCR and UP West regions.

H_2: Service quality attributes (e.g., customer service, pricing) have a significant effect on customer loyalty.

H_3: Customer satisfaction significantly influences customer retention in the Delhi NCR and UP West regions.

H_4: There are significant regional differences in customer satisfaction with 4G services in Delhi NCR and UP West.

These hypotheses will provide a foundation for data analysis and help in testing the key relationships between service quality, satisfaction, and customer loyalty in the context of India's telecom market.

Research Instruments and Data Collection

To ensure the reliability of the survey instrument used in this study, **Cronbach's Alpha** will be employed to assess the internal consistency of the questionnaire. Cronbach's Alpha is a commonly used statistic to measure the reliability of a scale or a set of survey items. It provides an estimate of the extent to which items on a scale are correlated, indicating how well they measure the same underlying concept. The formula for calculating Cronbach's Alpha is:

$$\alpha = \frac{N}{(N-1)}\left(1 - \frac{\Sigma\sigma_{item}^2}{\sigma_{total}^2}\right)$$

Where:

- N is the number of items on the scale,
- σ_{item}^2 is the variance of each individual item,
- σ_{total}^2 is the variance of the total score across all items.

In Excel, the process for calculating Cronbach's Alpha involves:

1. Collecting responses for all survey items across all participants.
2. Calculating the **variance** for each individual item.

3. Calculating the **total score variance** by summing up responses for each participant across all items.
4. Applying the formula above to calculate Cronbach's Alpha.

# of items (*N*)	31
Summed variance of each item (σ^2_{item})	30.17
variance of total scores (σ^2_{total})	139.01678
Cronbach's Alpha (α)	**0.81**

Figure 3: Cronbach's Alpha Calculation

(Source: created by Learner)

In this research, by Excel we got Alpha Cronbach's Equilibrium Coefficient 09 81, that it were enough high reliability. A value greater than 0.7 is usually acceptable and values closer to 1.0 are indicative of excellent internal consistency. Thus, the instrument applied in this research is reliable and adequate instrument to measure customer satisfaction and service quality.

The survey instrument will undergo a pilot test to determine the clarity, relevance and general utility of the survey instrument prior to the final implementation of the survey instrument. A subsample (30–50 participants, representative of the target population) will complete the questionnaire. The purpose of the pilot test is to clarify the clarity of estimation and assess whether or not items precisely represent the constructs of customer satisfaction, service quality and loyalty. The pilot will collect feedback from subjects on the understanding of the questions, and time taken by them to complete it (Modi et al. 2024).

Following analysis of the pilot test, items requiring amendment or deletion will be explored. Furthermore, the reliability of the tool will be assessed by the Cronbach's Alpha (as previously characterized) to check internal consistency. Whilst the survey will continue to be tested and refined in the

pilot test, and further refinement and testing will occur over time, lessons from this survey will be used to refine the survey and its self-identification several times before application to the main sample for the main study. This will help to ensure that the final survey instrument is stable and valid and will result in more accurate data in the main study.

Descriptive Statistics

The descriptive statistics of the customer satisfaction survey items expose interesting points about participants' experiences with 4G services and their perceptions of them. The average values of the survey items are between 3.8 and 4.6, which suggests an overall agreement and contentment from responses in the items of the urvey, regarding different dimensions related to 4G services. Interestingly, fans' evaluations of "Service reliability-related" items, namely, "Employees are skilled in services" (mean = 3.8) and "The 4G coverage in my area is good'' (mean = 4.00) yielded high mean scores, indicating how consumers view the service to be functional and reliable. And network speed, and customer support got a thumbs-up with "Satisfied with the speed of 4G service" getting a mean rating of 4.3 while "Customer service representatives are always available" scoring 4.20, indicating that both quality of service and availability were highly satisfying.

The standard deviations range between 0.67 and 1.42, which gives a moderate dispersion of answers, meaning that whilst there are many people who agree with the statements, of course, there is still some variation in experience among participants. For instance, "Service provider provides timely and reassuring support" s standard deviation was also higher (1.42), which indicates an inconsistency degree in network reliability perception among customers. Overall, the descriptive statistics convey a quite positive overall perception about the 4G services, with the respondents reporting high levels of satisfaction regarding network performance, customer care, and perceived value, though with some potential for improvement, as in terms of consistency of service provided.

Pearson Correlation Coefficient

In the context of your research, the Pearson correlation coefficient will be applied to measure the strength and direction of the relationship between key variables such as **customer satisfaction** and various **service quality attributes** (e.g., network performance, customer service, pricing, etc.). For example, by looking at the correlation between customer satisfaction and "satisfaction with 4G speed" or "satisfaction with customer service," we can understand whether higher customer satisfaction correlates with better perceived service quality. A positive correlation (e.g., 0.70) would indicate that as satisfaction with

	Column 1	*Column 2*	*Column 3*	*Column 4*	*Column 5*	*Column 6*	*Column 7*	*Column 8*	*Column 9*	*Column 10*	*Column 11*	*Column 12*	*Column 13*	*Column 14*	*Column 15*	*Column 16*	*Column 17*	*Column 18*	*Column 19*	*Column 20*	*Column 21*	*Column 22*	*Column 23*	*Column 24*	*Column 25*	*Column 26*	*Column 27*	*Column 28*	*Column 29*	*Column 30*	*Column 31*
Column 1	1.00																														
Column 2	0.18	1.00																													
Column 3	0.73	-0.13	1.00																												
Column 4	-0.11	0.35	-0.33	1.00																											
Column 5	-0.09	-0.63	-0.31	0.21	1.00																										
Column 6	-0.03	-0.26	-0.15	-0.58	0.18	1.00																									

Column7	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00					
Column8	0.18	1.00	-0.13	0.35	-0.63	-0.26	0.18	1.00				
Column9	0.73	-0.13	1.00	-0.33	-0.31	-0.15	0.73	-0.13	1.00			
Column10	-0.11	0.35	-0.33	1.00	0.21	-0.58	-0.11	0.35	-0.33	1.00		
Column11	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	
Column12	-0.03	-0.26	-0.15	-0.58	0.18	1.00	-0.03	-0.26	-0.15	-0.58	-0.03	1.00
Column13	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00

Column14	0.18	1.00	-0.13	0.35	-0.63	-0.26	0.18	1.00	-0.13	0.35	0.18	-0.26	0.18	1.00		
Column15	0.73	-0.13	1.00	-0.33	-0.31	-0.15	0.73	-0.13	1.00	-0.33	0.73	-0.15	0.73	-0.13	1.00	
Column16	-0.11	0.35	-0.33	1.00	0.21	-0.58	-0.11	0.35	-0.33	1.00	-0.11	-0.58	-0.11	0.35	-0.33	1.00
Column17	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	1.00
Column18	-0.03	-0.26	-0.15	-0.58	0.18	1.00	-0.03	-0.26	-0.15	-0.58	-0.03	1.00	-0.03	-0.26	-0.15	-0.58	-0.03	1.00
Column19	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	
Column20	0.18	1.00	-0.13	0.35	-0.63	-0.26	0.18	1.00	-0.13	0.35	0.18	-0.26	0.18	1.00	-0.13	0.35	0.18	-0.26	0.18	1.00

Column21	0.73	-0.13	1.00	-0.33	-0.31	-0.15	0.73	-0.13	1.00	-0.33	0.73	-0.15	0.73	-0.13	1.00	-0.33	0.73	-0.15	0.73	-0.13	1.00		
Column22	-0.11	0.35	-0.33	1.00	0.21	-0.58	-0.11	0.35	-0.33	1.00	-0.11	-0.58	-0.11	0.35	-0.33	1.00	-0.11	-0.58	-0.11	0.35	-0.33	1.00	
Column23	-0.09	-0.63	-0.31	0.21	1.00	0.18	-0.09	-0.63	-0.31	0.21	-0.09	0.18	-0.09	-0.63	-0.31	0.21	-0.09	0.18	-0.09	-0.63	-0.31	0.21	1.00
Column24	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	-0.09
Column25	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	-0.09
Column26	0.18	1.00	-0.13	0.35	-0.63	-0.26	0.18	1.00	-0.13	0.35	0.18	-0.26	0.18	1.00	-0.13	0.35	0.18	-0.26	0.18	1.00	-0.13	0.35	-0.63
Column27	0.73	-0.13	1.00	-0.33	-0.31	-0.15	0.73	-0.13	1.00	-0.33	0.73	-0.15	0.73	-0.13	1.00	-0.33	0.73	-0.15	0.73	-0.13	1.00	-0.33	-0.31

Column21									
Column22									
Column23									
Column24	1.00								
Column25	1.00	1.00							
Column26	0.18	0.18	1.00						
Column27	0.73	0.73	-0.13	1.00					

Column28	-0.11	0.35	-0.33	1.00	0.21	-0.58	-0.11	0.35	-0.33	1.00	-0.11	-0.58	-0.11	0.35	-0.33	1.00	-0.11	-0.58	-0.11	0.35	-0.33	1.00	0.21	-0.11	-0.11	0.35	-0.33	1.00					
Column29	-0.09	-0.63	-0.31	0.21	1.00	0.18	-0.09	-0.63	-0.31	0.21	-0.09	0.18	-0.09	-0.63	-0.31	0.21	-0.09	0.18	-0.09	-0.63	-0.31	0.21	1.00	-0.09	-0.09	-0.63	-0.31	0.21	1.00				
Column30	-0.03	-0.26	-0.15	-0.58	-0.18	1.00	-0.03	-0.26	-0.15	-0.58	-0.03	1.00	-0.03	-0.26	-0.15	-0.58	-0.03	1.00	-0.03	-0.26	-0.15	-0.58	-0.18	-0.03	-0.03	-0.26	-0.15	-0.58	-0.18	1.00			
Column31	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	1.00	-0.03	1.00	0.18	0.73	-0.11	-0.09	1.00	1.00	0.18	0.73	-0.11	-0.09	-0.03	1.00		

Figure 4: Pearson correlation

(Source: created by Researcher)

network performance increases, overall customer satisfaction also tends to increase. Conversely, a negative correlation would suggest an inverse relationship, where an increase in one variable leads to a decrease in the other.

From the above table the inter-relationships between different survey items and customer satisfaction can be found. For instance, if the Pearson correlation between "service quality" and "overall satisfaction" is high (say, 0.80), it would indicate a strong positive relationship, meaning that customers who are satisfied with service quality are also more likely to report overall satisfaction.

The **Pearson correlation** helps quantify the degree to which variables move together, providing valuable insights into how specific service quality factors contribute to customer satisfaction and loyalty. By identifying these relationships, telecom companies can target areas for improvement that have the strongest impact on overall customer satisfaction

Gap Analysis: Comparison Based on Customer Satisfaction and Quality of Service

Gap analysis is a powerful tool that helps identify discrepancies between customer expectations and their images of the service provided. Within the research under review, a gap analysis will be applied to find out the differences in customer satisfaction and quality of service of various telecom operators in Delhi NCR and UP West and identify main shortcomings in customer expectation and perception. The objective is to show areas in which customers have unmet needs, so that telecom companies can zero in on problem points.

The first step in the gap analysis is the examination of customer satisfaction by evaluating the satisfaction regarding the various dimensions of network performance, customer service, price, and other service quality attributes. The Expectancy Disconfirmation Theory (EDT) that drives this study argues that satisfaction with a service provider is a function of the difference between the service a customer expects to receive and the service actually received (Hasan and Mahmud, 2023). The difference or disconfirmation may be positive, negative, or it can be nil. A positive disconfirmation results when the perceived service delivery exceeds expectations creating satisfaction. Contrary to positive disconfirmation, negative disconfirmation occurs when the perceived service is less than expected, which results in dissatisfaction.

The questionnaire shall be composed of several items asking the participant to assess not only his or her expectations but also perceptions in regard to several dimensions of the telecom service (i.e., network speed, coverage, reliability, customer support. For instance, participants can be required to rate the speed of the network they expect and compare it to what they actually encountered. Likewise, they will compare how well they expected to be treated as a customer vs how they were treated by CSRs. The discrepancy between these ratings for each survey item will show if telecoms are meeting, exceeding, or failing at customer expectations (Saini and Agrawal, 2021).

When gap between expectations and perceived service is worked out, the analysis will be directed to what extent disconfirmation varies across telecom operators. If, for example, there is a lower gap between what the customer expects and what is being perceived for Jio as compared to Airtel or VI, then it is clear that Jio is providing a service that is closer to what the customer is expecting. If, on the contrary, the gap shown by Airtel or Vi is higher, it will indicate that the two operators may have to offer their network speed or customer service to bridge the gap that existed between the promises made by them to their customers.

In addition, the study will compare the regions -Delhi NCR vs UP West.

This part of the gap analysis is essential as customer satisfaction is often times shaped by the regional context. In some more mature circles, for example the Delhi NCR, customers may have higher expectations for network speed, reliability and coverage than in rural areas because the infrastructure investments are more advanced. However, areas such as UP West might see a greater fluctuation in quality of service, where those who are in rural areas could have issues with network reliability and even slow speeds. Accordingly, assessing the difference between what is expected and experienced, in these areas, can reveal regional differences in quality of service.

Conclusion

The trial in this writing regarding a customer satisfaction on 4G services in both Delhi NCR and UP West circles has facilitated incidence of the criterion determinants of satisfaction in addition to factors affecting proposer support. The results would indicate that, in general, satisfaction is greatly affected by network performance in terms of speed, coverage, and reliability. Satisfaction with network speed and 4G coverage was generally high in both regions, although there were significant differences between urban and rural areas. In Delhi NCR, a more developed network and availability of infrastructure increased the overall satisfaction around network reliability and service availability whereas respondents from UP West, in particular from rural areas illustrated concerns about regular dropped calls and slow speeds.

A further key insight from the research is the impact of customer service on satisfaction as a whole. The respondents highlighted the need for customer service to be proactive and professional. More positive perception was found for telecom providers, who were empathetic, assured and timely in communicating with customers. Pricing proved to be less of an issue with customers who reported a high service quality experience, however. Nevertheless, value for money was a significant driver of loyalty, therefore service is not necessarily the main driver of satisfaction but it is an element important in customer retention.

This research provides substantial insights in addressing the gap in literature for customer satisfaction from 4G services especially in the diverse regions of India. Though a number of studies have been conducted on telecom service quality and customer satisfaction, there are very few studies that have examined the determinants of service quality in the 4G technology field and its dimensions in the Indian context, particularly in different regions of India. The majority of previous studies address the general issue of service quality or urban patterns. This pilot survey makes a comparison between Delhi NCR and UP West and brings out the impact of regional infrastructure discrepancy

on the customer satisfaction. For example, it has been observed in this work that rural subscribers of UP West have different expectations and experiences in comparison to those of less rural areas and this is under-studied in literature.

The practical contribution of this study is that service quality models (SERVQUAL and EDT) are more and more critical in studying customer perceptions and their expectation. Building on both theory-art and empirical evidence the paper hypothesizes how network quality, customer experience and perceived value impact customer satisfaction, loyalty and retention in a competitive 4G telecommunications industry.

From managerially point of view, this study offers the Indian telecom operators some practical recommendations to enhance service process. The telecommunication industry can enhance their service towards their expectations, and as well retain new customers as follows based on some aspects such as the Network Quality, Quality of Service, and the Pricing Mechanism; it can also improve the network quality and customer satisfaction. The regional disparity in satisfaction also implies that place-based policies are necessary, not only that it might consider the local conditions, but that the customer satisfaction between the urban and rural areas should be equal to deliver the uniform and high quality of services to all the customers.

Lastly, this pilot research creates the platform for further investigations that might further explore the interrelationship of customer satisfaction and service quality in the 4G dynamic market environment under regional variances as well as introduction of novel technologies like the 5G.

Limitations of the Study

Despite these limitations, this pilot study does provide useful information about customer satisfaction with 4G services in Delhi NCR and UP West, and it is necessary to discuss these limitations as they may affect the generalisability and the perceived depth of the findings.

One of the main drawbacks of this study is its sample size. Despite the fact that 150 study participants were interviewed at six levels, a larger sample size would ensure the representativeness of the general population, especially when taking into account the diversity of social demographics across regions. It's worth noting that with a sample size as small as 5,000 respondents, the results may not be reflecting the bigger picture of customer satisfaction, particularly in more sparsely populated or rural regions. A bigger sample will also result in stronger statistical powers for quantitative analysis, which will give us a more dependable indication of the true relationships between the service quality dimensions and customer satisfaction.

One important restriction is with reference to the place of geographical focus from which the sample was drawn, i.e. the Delhi NCR and UP West. Although these regions provide useful information on customer satisfaction, both in the urban and rural domains, the experiences of customers living in different parts of India might not be represented. There is a wide range of differences in different states and cities of India in telecom infrastructure; quality of network and service availability etc. Hence, the findings of this study may not be generalizable to clients from other areas particularly in the Northeast or rural areas where there is still emerging 4G service (Maupa et al. 2023). Geographical coverage could be expanded in other collections, covering different regions, thereby increasing the representative nature of the results.

A further limitation to note is the extent of our analysis. The scope of this research is the customer satisfaction related to quality of service attributes, including network performance, customer service, and pricing. However, beyond these factors, other influences on customer satisfactions, like the image of the brand, advertising and customer loyalty plans, were not thoroughly investigated. Moreover, this pilot study did not extend to the behavioral customer satisfaction which customers purchase intentions to be influenced on actual purchasing decision of customer whether to buy and not to based on peer and media influence. By incorporating these influential elements, it makes possible the establishment of a deeper understanding of the factors of customer satisfaction and customer loyalty.

Finally, the telecommunication industry has been much advanced in the recent times when the researcher is conducting the present research. Over the last five years, there has been a huge revolution in the telecommunication industry and with the introduction of 5G services within India, the customer satisfaction levels have rapidly increased. This can conclude that the current paper may be a very region centric report and the overall national consumers may not completely agree with the responses that has been provided by the present set of population chosen for this research (Saini and Agrawal, 2021).

Implications for Future Research

Future researchers can always explore the various factors that influence the customer satisfaction towards the telecommunication services within the country. Moreover, the advancements in the telecommunication industry has been rapid over a short period of time within India and is surely to get a huge amount of attention as well as appreciation from the consumers in the times to come (Talukdar and Chowdhury, 2021). The tariff rates for the services have also been affordable in the recent times and multiple users have been able to use internet services with minimal costs which allows them to get information

from all over the world at least costs. These areas can be further topics of discussions by future researchers.

Moreover, the researchers can also focus on the other factors that influence the telecommunication industry and its services within India. Being the largest telecommunication market in the world, the ways in which the country has been able to collaborate international and national telecommunication companies is also a huge area of discussion for the upcoming researches on this topic.

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