INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD
ISSN(O): 2455-0620 [Impact Factor: 9.47]
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value : 86.87
Volume - 12, Issue - 10, October - 2026

DOIs:10.2015/IJIRMF/202610006 --:-- Research Paper / Article / Review

An empirical assessment of 5G network quality, customer experience and satisfaction

[1]Parthasaradhy. T, [2]K. Kishor , [3]V. Deepa, [4]T. Neeraja
[1]Department of Management studies, Sri Venkateshwaraa College of Engineering and Technology, Puducherry, India.
[2,3,4]Department of Electronics and Communications Engineering, Sri Venkateshwaraa College of Engineering and Technology, Puducherry, India.
[1]drtps16@gmail.com, [2]kishor25@svcet.ac.in, [3]deepaece@svcet.ac.in, [4]neeraja@svcet.ac.in

Abstract - *The rapid adoption of fifth-generation (5G) mobile technology has transformed mobile communication by offering higher data speeds, improved connectivity, lower latency, and enhanced network capabilities. Customer satisfaction has become an important indicator of the successful adoption and continued use of 5G mobile networks. This study examines customer satisfaction with 5G mobile networks by assessing respondents' perceptions of network speed, connectivity, voice-call quality, signal strength, service quality, pricing, value for money, problem resolution, professional usefulness, and willingness to continue and recommend their current service provider. A quantitative research design was adopted for this study and data were collected from 138 respondents using a structured questionnaire. Descriptive statistics, one-way ANOVA, and Pearson Chi-Square tests were used to analyse the data and examine the relationships and variables between consumer demographics and their perceptions of 5G technology. The findings indicate that gender significantly influences perceptions of several aspects of 5G service performance, including network stability, voice-call quality, signal strength, value, and intention to continue and recommend the service provider. Significant associations were also observed between educational qualification and perception of 5G pricing, occupation and perceived signal strength, place of residence and perceptions of innovative 5G features, and primary purpose of 5G usage and perceived improvement in service quality. However, duration of 5G usage was not significantly associated with perceived value for money. Overall, the study highlights that customer satisfaction with 5G networks is influenced by both service-related factors and selected demographic characteristics.*

Keywords : *fifth generation, mobile networks, perception, satisfaction and technology.*

1. INTRODUCTION:

In contemporary society, smart phones have evolved into essential tools, with fast internet connectivity playing a pivotal role (3), the evolution of mobile communication has fundamentally reshaped personal, social, and professional interactions. Moving from early-generation networks to advanced 5G technology has significantly boosted data speeds and network reliability, creating a more efficient global communication ecosystem. The introduction of 5G represents an important milestone in this development, offering higher data speeds, lower latency, improved network capacity, enhanced connectivity, and support for a wide range of emerging digital applications. As 5G networks continue to expand, understanding customers' experiences and satisfaction with these services has become increasingly important for both service providers and researchers. Beyond high-speed connectivity, 5G functions as a comprehensive digital framework designed to empower data-heavy applications, ranging from artificial intelligence and cloud-based services to connected vehicles, IoT networks and other data-intensive applications The ability of 5G networks to accommodate a large number of connected devices while maintaining network performance has created new opportunities for individuals, businesses, educational institutions, healthcare organizations, and other sectors. Consequently, customers increasingly expect mobile network providers to deliver consistent speed, stable connectivity, strong signal coverage, reliable voice communication, and high-quality customer service.

Customer satisfaction represents a vital determinant of success within service-oriented sectors. In the telecommunications sector, satisfaction is influenced by several factors, including service quality, network performance,

price, reliability, customer support, perceived value, and the ability of the service to meet users' expectations. A customer may consider a 5G service satisfactory when it provides the expected speed and connectivity at a reasonable price while also delivering reliable coverage and efficient resolution of service-related problems. Therefore, evaluating customer satisfaction requires consideration of both technical and service-related dimensions rather than focusing solely on network speed. The transition to 5G has significantly elevated customer expectations. Subscribers adopting 5G anticipate measurable improvements over 4G in network speed, connection stability, coverage reliability, and voice-call quality. At the same time, customers are concerned about the affordability of 5G plans and whether the additional cost provides sufficient value. The perceived value of a 5G service is therefore determined by the relationship between the benefits received and the price paid. If customers perceive that the service provides inadequate value, even technically advanced network performance may not result in high levels of satisfaction or continued usage. Customer satisfaction is also closely related to customer loyalty and retention. Satisfied customers are more likely to continue using their existing service provider and recommend the provider to others. In contrast, dissatisfaction with network quality, pricing, coverage, or customer support may encourage customers to switch to competing service providers. For telecommunications companies operating in an increasingly competitive environment, understanding the factors that influence customer satisfaction is therefore essential for developing effective marketing, pricing, network improvement, and customer-retention strategies.

In addition to service characteristics, demographic and usage-related factors may influence how customers perceive 5G services. Variables such as gender, educational qualification, occupation, place of residence, duration of 5G usage, and primary purpose of using 5G may shape customers' expectations and experiences. For example, professional users may place greater importance on network reliability and connectivity, while users with different educational or occupational backgrounds may evaluate pricing and service quality differently. Similarly, customers living in different locations may have different experiences regarding network coverage and signal strength. Examining these differences can provide a more comprehensive understanding of customer satisfaction with 5G mobile networks. Against this background, the present study, titled "Customer Satisfaction with 5G Mobile Networks," focuses on evaluating customers' perceptions of 5G network performance, service quality, pricing, value for money, customer support, professional usefulness, and future expectations. The study also examines whether customer perceptions differ according to selected demographic and usage characteristics. Statistical techniques such as descriptive analysis, one-way ANOVA, and Pearson Chi-Square tests are employed to identify significant differences and associations among the variables. The study offers valuable insights for mobile operators, marketers, policymakers, and researchers seeking to understand user expectations and enhance the 5G experience. This study is highly relevant given the rapid adoption of digital technologies and our growing dependence on high-speed mobile connectivity. As consumers become more digitally integrated, their expectations for network quality and service reliability continue to rise. Analyzing customer satisfaction allows telecommunications providers to pinpoint critical areas for improvement and design user-centric strategies that foster loyalty, retention, and positive word-of-mouth. Ultimately, this research deepens the understanding of how 5G service attributes influence customer satisfaction, offering actionable insights for the ongoing advancement of customer-centric 5G mobile services.

2. REVIEW OF LITERATURE:

Customer satisfaction is widely acknowledged as a critical determinant of organizational success and long-term sustainability in service industries, particularly in telecommunications where offerings are largely intangible and highly competitive [1]. The advent of 5G technology is poised to reshape the telecommunications landscape. Its full impact on consumer preferences, market dynamics, and regulatory frameworks will become clearer in the coming years [2]. Technology is something that has ever-increasing implications in every area of everyday life [3]. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices [4]. The fifth generation of mobile technology (5G) offers faster and more reliable connections for a massive number of connected devices [5]. Customer satisfaction with mobile network providers negatively relates to intention to use 5G, but positively relates to loyalty. Customer satisfaction can thus lead to the intention to use 5G (5). The main motivation 5G has been the need of more bandwidth and lower latency [6]. Mobile verbal exchange is viewed as one of the essential problem in the area of cellular networks [7]. 5G is often described as a transformational technology, 5G is often framed as a transformational technology. Through its improved technical characteristics compared to previous generations of mobile technologies, 5G is able to support the development of innovative (new) services across the whole economy [8].

3. RESEARCH OBJECTIVES:

- To evaluate customer satisfaction with 5G mobile networks across key performance indicators, including network speed, connectivity, voice-call quality, signal strength, service quality, pricing, and overall value for money.
- This study examines how demographic and usage characteristics including gender, educational qualification, occupation, place of residence, duration of 5G usage, and primary purpose of 5G usage on customers' perceptions of 5G services.
- This study evaluates customers' future behavioral intentions regarding 5G services, focusing on their continuance intention and word-of-mouth recommendations for their current provider.

4. RESEARCH METHODOLOGY:

4.1 Research Design

The study adopted a quantitative, descriptive and analytical research design to examine customer satisfaction with 5G mobile networks. The descriptive component was used to understand respondents' perceptions of 5G network performance, service quality, pricing, value for money, customer support, professional usefulness, and future expectations. The analytical component was used to examine differences and associations between selected demographic/usage characteristics and perceptions of 5G services.

The study gathered primary data using a structured questionnaire distributed to 138 respondents, analyzing the results through descriptive statistics, one-way ANOVA, and Pearson's chi-square tests

1) 4.2. Hypothesis of the study

- H01: There is no significant difference in the perceptions of respondents based on gender.
- H02: There is no significant association between respondents' educational qualification and their perception regarding the reasonableness of 5G plan pricing.
- H03: There is no significant association between respondents' occupation and their perception of indoor and outdoor 5G signal strength.
- H04: There is no significant association between the place of residence and the perception that 5G networks offer innovative features compared to previous generations.
- H05: There is no significant association between the duration of 5G service usage and the perception of data package value relative to its price.
- H06: There is no significant association between the primary purpose of using 5G services and the perception of its quality compared to older mobile network generations.

2) 5. Analysis

H01: There is no significant difference in the perceptions of respondents based on gender.

Table: 1 Perceptions of Respondents Based On Gender.

5G perception statement	F-value	p-value	Interpretation
Internet speed is consistently fast	3.952	.049	Significant
Stable connectivity throughout the day	19.625	<.001	Highly significant
Voice-call quality meets expectations	10.955	.001	Highly significant
Good indoor/outdoor signal strength	8.180	.005	Significant
Service quality better than previous generations	4.798	.030	Significant
Price of 5G plan is reasonable	4.912	.028	Significant
Data package offers adequate value for price	4.412	.038	Significant
Service-related problems are resolved efficiently	4.504	.036	Significant
Innovative features compared with previous generations	2.278	.134	Not significant
5G supports professional activities effectively	12.136	.001	Highly significant
5G enhances communication and future wellbeing	3.001	.086	Not significant
Continue and recommend current provider	11.036	.001	Highly significant
Coverage will improve in urban and rural areas	.567	.453	Not significant
5G services will become more affordable	2.377	.126	Not significant

Source: Output from SPSS

A one-way ANOVA was conducted to examine whether gender (male and female) significantly influences respondents' perceptions of 5G network services. The results indicate that significant gender-based differences were observed for internet speed ($F = 3.952$, $p = .049$), network stability ($F = 19.625$, $p < .001$), voice-call quality ($F = 10.955$, $p = .001$), indoor/outdoor signal strength ($F = 8.180$, $p = .005$), service quality compared with previous generations ($F = 4.798$, p

= .030), price reasonableness (F = 4.912, p = .028), value for money (F = 4.412, p = .038), efficiency in resolving service-related problems (F = 4.504, p = .036), professional usefulness of 5G (F = 12.136, p = .001), and willingness to continue and recommend the current service provider (F = 11.036, p = .001). Among these, network stability showed the strongest significant difference between male and female respondents. However, no significant gender differences were found regarding innovative features (p = .134), enhancement of communication and future wellbeing (p = .086), expected improvement in coverage (p = .453), and future affordability of 5G services (p = .126). Thus, the findings suggest that gender significantly influences perceptions of several current 5G service quality, performance, value, and satisfaction dimensions, whereas gender does not significantly influence perceptions of certain future-oriented aspects of 5G technology.

Based on the ANOVA results: Since significant differences were found for several variables at $p < 0.05$, H_0 is rejected and H_1 is accepted for those variables. For variables with $p > 0.05$, H_0 is not rejected.

H02: There is no significant association between respondents' educational qualification and their perception regarding the reasonableness of 5G plan pricing.

Table: 2 Associations between respondents' educational qualification and their perception regarding the reasonableness of 5G plan pricing

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	38.552[a]	12	.000
Likelihood Ratio	35.072	12	.000
Linear-by-Linear Association	.573	1	.449
N of Valid Cases	138		
a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .17.			

Source: Output from SPSS

A Pearson Chi-Square test was conducted to examine the association between educational qualification and respondents' perception that the price of their 5G plan is reasonable. The results indicate a statistically significant association between educational qualification and perception of 5G plan pricing, with $\chi^2(12) = 38.552$, $p < .001$. Therefore, the null hypothesis is rejected, indicating that respondents' perceptions of the reasonableness of 5G plan prices differ significantly according to their educational qualification. However, the result should be interpreted with caution because 13 cells (65%) have expected frequencies below 5, with the minimum expected count being 0.17, which violates the usual Chi-Square assumption. Thus, combining categories or conducting an exact/Monte Carlo test may be appropriate to confirm the finding.

Decision: Since the Pearson Chi-Square test gives $\chi^2 = 38.552$, df = 12, $p < .001$, the null hypothesis **(H_0)** is rejected**,** and the alternative hypothesis **(H_1) is** accepted. Thus, educational qualification has a significant association with respondents' perception of the reasonableness of their 5G plan price.

H03: There is no significant association between respondents' occupation and their perception of indoor and outdoor 5G signal strength.

Table: 3 Associations between respondents' occupation and their perception of indoor and outdoor 5G signal strength.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34.397[a]	12	.001
Likelihood Ratio	32.399	12	.001
Linear-by-Linear Association	2.683	1	.101
N of Valid Cases	138		
a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .35.			

Source: Output from SPSS

A Pearson Chi-Square test was conducted to examine the association between occupation and respondents' perception of good indoor/outdoor 5G signal strength. The results show a statistically significant association between occupation and perception of 5G signal strength, with $\chi^2(12) = 34.397$, $p = .001$**.** Therefore, the null hypothesis is rejected, indicating that respondents' perceptions of indoor and outdoor 5G signal strength differ significantly according to their occupation. However, the finding should be interpreted with caution because 13 cells (65%) have expected frequencies below 5,

with a minimum expected count of 0.35, which does not satisfy the usual Chi-Square assumption. Therefore, combining categories or using an exact/Monte Carlo test is recommended to confirm the robustness of the association.
Decision: Since the Pearson Chi-Square result is $\chi^2(12) = 34.397$, $p = .001 < .05$, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is supported.

H04: There is no significant association between the place of residence and the perception that 5G networks offer innovative features compared to previous generations

Table: 4 Associations between the place of residence and the perception that 5G networks offer innovative features compared to previous generations.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19.961[a]	8	.010
Likelihood Ratio	20.001	8	.010
Linear-by-Linear Association	1.504	1	.220
N of Valid Cases	136		
a. 5 cells (33.3%) have expected count less than 5. The minimum expected count is .50.			

Source: Output from SPSS

A Pearson Chi-Square test was conducted to examine the association between place of residence and respondents' perception that their 5G network offers innovative features compared with previous generations. The results indicate a statistically significant association between place of residence and perception of 5G innovation, with $\chi^2(8) = 19.961$, $p = .010$. Since the *p*-value is less than 0.05, the null hypothesis is rejected, indicating that respondents' perceptions of innovative 5G features differ significantly according to their place of residence. However, the result should be interpreted with some caution because 5 cells (33.3%) have expected frequencies below 5, with the minimum expected count being 0.50. Although this exceeds the commonly used 20% threshold for cells below 5, the low minimum expected count suggests that combining categories or using an exact/Monte Carlo test may be considered for further confirmation.
Decision**:** Since the Pearson Chi-Square result is $\chi^2(8) = 19.961$, $p = .010 < .05$, the null hypothesis **(**H_0**) is** rejected**,** and the alternative hypothesis **(**H_1**)** is supported.

H05: There is no significant association between the duration of 5G service usage and the perception of data package value relative to its price.

Table: 5 Associations between the duration of 5G service usage and the perception of data package value relative to its price.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.344[a]	12	.223
Likelihood Ratio	19.157	12	.085
Linear-by-Linear Association	1.486	1	.223
N of Valid Cases	138		
a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is 1.35.			

Source: Output from SPSS

A Pearson Chi-Square test was conducted to examine the association between duration of using 5G services and respondents' perception that their current data package offers adequate value for the price. The results show that there is no statistically significant association between duration of 5G usage and perceived value for money, with $\chi^2(12) = 15.344$, $p = .223$. Since the *p*-value is greater than 0.05, the null hypothesis is not rejected, indicating that respondents' perceptions of the value offered by their current 5G data package do not differ significantly according to the duration of 5G usage. The result should nevertheless be interpreted with caution because 8 cells (40%) have expected frequencies below 5, with a minimum expected count of 1.35; therefore, combining categories or applying an exact/Monte Carlo test may be considered for further validation.
Decision: Since the Pearson Chi-Square result is $\chi^2(12) = 15.344$, $p = .223 > .05$, the null hypothesis (H_0) is not rejected, while the alternative hypothesis (H_1) is not supported.

H06: There is no significant association between the primary purpose of using 5G services and the perception of its quality compared to older mobile network generations.

Table: 6 There is no significant association between the primary purpose of using 5G services and the perception of its quality compared to older mobile network generations.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	86.400[a]	28	.000
Likelihood Ratio	63.012	28	.000
Linear-by-Linear Association	.482	1	.487
N of Valid Cases	138		
a. 33 cells (82.5%) have expected count less than 5. The minimum expected count is .03.			

Source: Output from SPSS

Pearson Chi-Square test was conducted to examine the association between primary purpose of using 5G and respondents' perception that the service quality is better than previous mobile network generations. The results indicate a statistically significant association, with $\chi^2(28) = 86.400$, $p < .001$. Since the *p*-value is less than 0.05, the null hypothesis is rejected, indicating that respondents' perceptions of improved 5G service quality differ significantly according to their primary purpose for using 5G. However, the result should be interpreted with considerable caution, as 33 cells (82.5%) have expected frequencies below 5, with the minimum expected count being only 0.03. This substantially violates the assumptions of the Pearson Chi-Square test; therefore, categories should ideally be combined and/or an exact or Monte Carlo test should be conducted before drawing a firm conclusion.

Decision: Since the Pearson Chi-Square result is $\chi^2(28) = 86.400$, $p < .001$, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is supported. However, because 82.5% of cells have expected counts below 5, the finding should be interpreted with caution and ideally verified using a Monte Carlo or exact test.

6. CONCLUSION:

Customer satisfaction with 5G networks depends less on baseline technical speeds and more on user demographics, specific usage habits, and connection stability. Gender heavily influences how customers view core service performance, including network stability, voice quality, signal strength, value, and provider loyalty. However, future expectations for 5G availability and affordability remain the same across all demographics.

Furthermore, factors such as educational background, occupation, residential location, and primary usage purpose significantly impact how customers view pricing reasonableness, signal reliability, innovative capabilities, and overall network performance. Interestingly, length of subscription tenure does not influence customer perceptions of value for money, indicating that perceived value must be continuously reinforced by service providers.

Acknowledgements:

We would like to thank respondents for providing the data essential for this study. We gratefully acknowledge the support of the Sri Venkateshwaraa College of Engineering and Technology, Puducherry.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Informed Consent

The informed consent for this study was obtained in verbal form. Participants were informed about the study objectives, procedures, and their voluntary participation and they provided their consent verbally before taking part in the structured online questionnaire. Due to the nature of this industry-based study, written consent was not feasible, and verbal consent was deemed appropriate.

Ethical Approval

We confirm that this study involved human participants. As this was an survey-based study conducted with internal data and participants' voluntary verbal consent, formal ethical approval from an institutional review board was not obtained. All procedures were conducted following standard ethical practices for research.

REFERENCES :

1. Bhale, U. A., Banerjee, S., Joshi, P., Kalshetti, P., & Ray, S. (2026). Customer satisfaction framework for telecom services: Multidimensional constructs and demographic variations. *MSW Management Journal, 36*(1), 492–509. https://doi.org/10.7492/rw23b147
2. Czajkowski, M., Zawadzki, W., Bernatek, G., & Sobolewski, M. (2024). Assessing the substitutability of mobile and fixed internet: The impact of 5G services on consumer valuation and price elasticity. Telecommunications Policy, 48(10), 102869. https://doi.org/10.1016/j.telpol.2024.102869.

3. Fahrillah, A. A., Suroso, A. I., & Yuliati, L. N. (2024). Factors affecting purchase intention 5G smartphone in Indonesia using the extended TPB approach. Jurnal Aplikasi Manajemen, 22(2), 492–508. https://doi.org/10.21776/ub.jam.2024.022.02.14
4. Gandhi, A., & Shah, S. (2024). Customer Perception on the Impact of 5G Technology based Smartphones. Sachetas, 3(3), 43-55.
5. Lu, H., & Huang, S. (2024). Assessing the key factors influencing 4G users' intentions to upgrade to 5G networks. Technology in Society, 81, 102810. https://doi.org/10.1016/j.techsoc.2024.102810
6. Mitra, R. N., & Agrawal, D. P. (2015). 5G mobile technology: A survey. ICT Express, 1(3), 132–137. https://doi.org/10.1016/j.icte.2016.01.003
7. Rehman, A. U., Mahmood, I., Kamran, M., Sanaullah, M., Ijaz, A., Ali, J., & Ali, M. (2022). Enhancement in Quality-of-Services using 5G cellular network using resource reservation protocol. Physical Communication, 55, 101907. https://doi.org/10.1016/j.phycom.2022.101907
8. Whalley, J., & Curwen, P. (2023). Creating value from 5G: The challenge for mobile operators. Telecommunications Policy, 48(2), 102647. https://doi.org/10.1016/j.telpol.2023.102647.