

ROLE OF CHATBOTS IN ENHANCING CUSTOMER SUPPORT EXPERIENCE

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Abstract

The proliferation of artificial intelligence-powered chatbots has transformed customer service delivery across industries, yet limited empirical evidence exists regarding the specific attributes that drive customer satisfaction in regional contexts. This study examines the role of chatbots in enhancing customer support experiences within Ernakulam district, Kerala, India's technology and economic hub, characterized by high digital literacy rates. A descriptive research design was employed, collecting primary data through structured online questionnaires from one hundred respondents who had interacted with chatbot-supported customer service systems. The study investigated relationships among general perception, chatbot effectiveness, personalization, and overall customer satisfaction, while also exploring gender-based differences in satisfaction outcomes. Statistical analyses, including Pearson correlation, multiple regression, and chi-square tests, revealed significant findings. Chatbot personalization emerged as the strongest predictor of customer satisfaction, followed by chatbot effectiveness, collectively explaining over half of satisfaction variance. A significant association was observed between gender and satisfaction levels, with female respondents reporting substantially higher satisfaction rates compared to males. These findings indicate that customers prioritize personalized, contextually relevant interactions over general perceptions of chatbot technology. The study offers actionable insights for organizations seeking to optimize chatbot interfaces, emphasizing strategic investments in personalization capabilities, adaptive response generation, and user-specific service customization to deliver superior customer experiences in digitally mature markets.

Keywords: Chatbots, customer satisfaction, personalization, artificial intelligence, customer support, digital services, gender differences

1. INTRODUCTION

The rapid advancement of digital technologies has fundamentally reshaped the landscape of customer-organization interactions across industries. Among these technological innovations, chatbots have emerged as prominent automated customer support tools, powered by Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP). These intelligent systems are engineered to simulate human-like conversations and deliver instantaneous assistance to customers across diverse platforms, including websites, mobile applications, and social media channels. The proliferation of chatbots reflects a broader shift toward automation in service delivery, driven by evolving consumer expectations for speed, accessibility, and personalized engagement.

Customer support constitutes a critical determinant of business success, as it directly influences customer satisfaction, loyalty, and retention outcomes. Traditional support channels such as phone calls and emails are frequently characterized by delays, limited-service availability, and elevated operational costs, all of which can detract from the overall customer experience. Chatbots address these persistent challenges by offering real-time responses and round-the-clock service availability, thereby bridging the gap between customer expectations and organizational capabilities. Modern AI-powered chatbots have evolved considerably beyond simple rule-based systems, now possessing the capacity to

understand user intent, personalize interactions based on contextual data, and deliver accurate, relevant responses. This technological maturity has prompted organizations to invest substantially in chatbot technology as a means of enhancing customer engagement, reducing response times, and improving operational efficiency. However, despite the growing adoption of these systems, limited empirical evidence exists regarding the specific attributes that most significantly contribute to customer satisfaction within regional contexts, particularly in digitally advanced yet geographically specific locales. This study examines the role of chatbots in enhancing customer support experiences within Ernakulam district, Kerala, the IT and economic hub of the state, characterized by high digital literacy rates. Specifically, the investigation seeks to determine how chatbot effectiveness and personalization influence customer satisfaction, while also exploring gender-based differences in satisfaction outcomes. By addressing these research gaps, the study aims to provide actionable insights for organizations seeking to optimize chatbot interfaces and deliver superior customer service in digitally mature markets.

1.2 Statement of the Problem

Although organizations increasingly implement chatbots to improve customer support services, customer responses toward chatbot interactions are mixed. While some users appreciate quick responses and convenience, others perceive chatbots as limited in understanding complex issues. The effectiveness of chatbot systems depends largely on factors such as response speed, accuracy, usability, and personalization. Failure in these areas may result in dissatisfaction and reduced customer trust. Therefore, it becomes essential to assess whether chatbots genuinely enhance customer support experiences and identify the factors that contribute to customer satisfaction.

1.3 Problem Statement

With the rapid expansion of digital customer service platforms in Ernakulam district, Kerala's IT and economic hub, businesses have increasingly deployed chatbots to handle customer inquiries and support functions. Despite the growing adoption of these automated systems, there remains limited empirical evidence on how specific chatbot attributes—namely effectiveness and personalization—influence customer satisfaction within the local context. Furthermore, the extent to which demographic factors such as gender contribute to variations in satisfaction outcomes has not been adequately examined in this region. The absence of such data poses challenges for organizations seeking to optimize chatbot interfaces to meet the expectations of a digitally literate yet diverse consumer base. This study addresses these gaps by investigating the relationships among chatbot effectiveness, personalization, and customer satisfaction, while also exploring gender-based differences in satisfaction levels among users in Ernakulam.

1.4 Scope of the Study

This study was confined to customers who had interacted with chatbot-supported customer service systems within Ernakulam district of Kerala, India. The research focused on three key chatbot attributes—general perception, effectiveness, and personalization—and examined their associations with overall customer satisfaction. The study employed a descriptive research design with a convenience sample of 100 respondents, utilizing structured online questionnaires for data collection. Statistical analyses were limited to Pearson correlation, multiple regression, and chi-square tests to evaluate relationships, predictive influence, and gender-based differences, respectively. The findings are specific to the geographic and demographic context of Ernakulam and may not be generalizable to other regions or populations with different levels of digital literacy or technological exposure. Temporal constraints and the cross-sectional nature of the data further delimit the scope, as the study captures satisfaction perceptions at a single point in time rather than tracking changes over extended periods.

1.5 Objectives of the Study

1. To examine the relationship between chatbot effectiveness and customer satisfaction among users in Ernakulam district.
2. To determine the predictive influence of chatbot personalization on customer satisfaction.

3. To analyze gender-based differences in customer satisfaction levels with chatbot interactions.

1.6 Research Hypotheses

H₁: There is a significant positive relationship between chatbot effectiveness and customer satisfaction.

H₀₁: There is no significant relationship between chatbot effectiveness and customer satisfaction.

H₂: Chatbot personalization has a significant positive relationship with customer satisfaction.

H₀₂: There is no significant relationship between chatbot personalization and customer satisfaction.

H₃: Chatbot personalization significantly predicts customer satisfaction when controlling for other chatbot attributes.

H₀₃: Chatbot personalization does not significantly predict customer satisfaction when controlling for other chatbot attributes.

H₄: There is a significant association between gender and customer satisfaction.

H₀₄: There is no significant association between gender and customer satisfaction.

2. LITERATURE REVIEW

The adoption of Artificial Intelligence (AI)-powered chatbots has accelerated significantly in customer service environments as organizations seek to improve service quality, operational efficiency, and customer engagement. Recent studies suggest that chatbots have evolved from rule-based systems into sophisticated conversational agents capable of understanding customer intent, generating contextual responses, and supporting personalized interactions. The increasing integration of natural language processing (NLP) and generative AI technologies has enabled chatbots to provide real-time support across various industries, including banking, e-commerce, tourism, healthcare, and telecommunications (Buhalis et al., 2023; Verma et al., 2024). These technological advancements have transformed customer support by reducing response times and ensuring continuous service availability.

Customer satisfaction remains one of the most important outcomes associated with chatbot implementation. Daza Vergaray, Peralta Robles, and Salazar Jiménez (2023), in their systematic literature review of chatbot technology, found that chatbots contribute positively to customer support by resolving queries quickly, enhancing service accessibility, and reducing waiting times. Their review highlighted that customer satisfaction is strongly associated with the chatbot's ability to provide accurate information and immediate responses. However, the study also noted that customer acceptance depends on users perceiving chatbots as useful and reliable, particularly during routine service interactions.

Recent research has increasingly emphasized chatbot effectiveness as a key determinant of customer experience. AI-based chatbots are capable of handling large volumes of customer inquiries simultaneously, thereby improving service efficiency and reducing organizational costs. Hsu and Lin (2023) observed that customers generally appreciate chatbots when they provide fast and relevant responses, especially in digital service environments. Similarly, Kekäläinen et al. (2025) reported that chatbot service quality is significantly influenced by the ability of AI systems to understand customer requests accurately and generate contextually appropriate responses. The study further indicated that poor response quality can negatively affect customer trust and satisfaction, highlighting the importance of chatbot effectiveness in customer support settings.

Personalization has emerged as another critical factor influencing customer satisfaction with chatbots. As AI technologies become more sophisticated, organizations increasingly utilize customer data to deliver tailored responses and recommendations. Uzan, Freud, and Elalouf (2025) demonstrated that personalized and empathetic chatbot interactions significantly improve customer satisfaction compared to standard automated responses. Their findings revealed that

customers perceive personalized interactions as more human-like and engaging, thereby strengthening their relationship with the service provider. Furthermore, recent reviews of AI-enabled customer experience management indicate that personalization contributes to emotional value creation, customer loyalty, and long-term engagement when implemented transparently and ethically (Utami & Wang, 2026).

The emergence of generative AI has further enhanced chatbot capabilities in customer service. Large Language Model (LLM)-based chatbots such as ChatGPT, Gemini, and Microsoft Copilot can generate natural and context-aware conversations, providing a more realistic customer interaction experience. Saviano et al. (2025) examined the role of generative AI chatbots in customer service and found that although these systems demonstrate improved conversational abilities, they still struggle to replicate the emotional intelligence and empathy exhibited by human agents. The researchers introduced the concept of "Artificial Emotional Awareness" and suggested that chatbot systems should complement rather than replace human support, particularly when dealing with emotionally sensitive or complex customer issues.

Trust is another important dimension influencing customer acceptance of chatbot technologies. Customers are more likely to adopt and continue using chatbot services when they perceive them as competent, reliable, and transparent. A qualitative study conducted by Zhang et al. (2026) found that users develop trust in AI chatbots when the systems demonstrate both technical competence and human-like conversational cues. The study emphasized that reliability, responsiveness, and consistency play crucial roles in shaping customer perceptions of chatbot trustworthiness. The researchers also highlighted that transparency regarding chatbot identity and capabilities contributes positively to customer confidence and acceptance.

Despite the growing benefits of chatbot technology, several studies have identified limitations related to customer experience. Customers often express concerns regarding a chatbot's inability to handle complex service requests, understand emotional contexts, or provide nuanced problem-solving assistance. Saviano et al. (2025) found that while generative AI chatbots have significantly improved customer interactions, customers still prefer human intervention for situations that require empathy and judgment. Similarly, Daza Vergaray et al. (2023) reported that chatbot technology performs best when handling routine inquiries but may negatively impact customer satisfaction when responses lack personalization or contextual relevance.

3. RESEARCH METHODOLOGY

The study was conducted in Ernakulam district of Kerala, India, a region widely recognized as the IT and economic hub of the state. Given the district's high digital literacy rate and its status as a major center for technology-enabled services, the locale provided an appropriate context for examining chatbot interactions within customer service environments. A descriptive research design was adopted to systematically characterize customer perceptions of chatbot attributes and satisfaction levels. The target population comprised customers who had previously interacted with chatbot-supported customer service systems across digital platforms in this region. A convenience sampling technique was utilized to select 100 respondents based on accessibility and willingness to participate. Primary data were collected through structured online questionnaires distributed via digital channels, capturing demographic information, perceptions of chatbot attributes, and satisfaction levels using Likert-scale items. Secondary data were obtained from research journals, books, websites, and academic publications to provide theoretical grounding.

Data analysis was conducted using descriptive and inferential statistical techniques in SPSS and Microsoft Excel. Descriptive statistics, including frequencies and percentages, were computed to analyze demographic characteristics and respondent opinions. Pearson correlation analysis evaluated bivariate relationships between chatbot attributes and overall satisfaction, while multiple regression analysis determined the predictive influence of chatbot effectiveness and personalization on satisfaction, controlling for general perception. A chi-square test of independence examined gender differences in customer satisfaction levels. SPSS served as the primary tool for inferential analyses, whereas Excel facilitated data organization and preliminary descriptive computations.

4. RESULTS AND DISCUSSION

4.1 Demographic Characteristics

Characteristic	Category	N	%
Age	18–24	64	64
	25–34	22	22
	35–44	10	10
	45+	4	4
Gender	Male	62	62
	Female	38	38
Income	Lower	8	8
	Lower-Middle	28	28
	Middle	48	48
	Upper-Middle	16	16
Education	Secondary/Below	4	4
	Undergraduate	6	6
	Bachelor's	34	34
	Postgraduate	56	56
Usage Frequency	Infrequent	16	16
	Moderate	32	32
	Frequent	52	52

Table 1. Demographic Characteristics

Source: Survey data

The sample was predominantly composed of respondents between the ages of 18 and 24 years, who accounted for nearly two-thirds of the participant pool (64.0%), as detailed in Table 1. This age distribution reflects a strong orientation toward younger consumers, a demographic historically more receptive to digital service interfaces. Males constituted 62.0% of the sample, whereas females represented 38.0%, indicating a gender imbalance that may limit the generalizability of findings to female-dominated service contexts. In terms of socioeconomic standing, the majority of respondents (48.0%) fell within the middle-income bracket, followed by lower-middle (28.0%) and upper-middle (16.0%) groups; only a small fraction (8.0%) reported belonging to high-income households. This income skew suggests that the findings are most applicable to consumers with moderate discretionary spending power.

Educational attainment was concentrated at the postgraduate level, with 56.0% of respondents holding a master's degree or higher, while 34.0% possessed a bachelor's degree and the remaining 10.0% reported undergraduate or secondary education as their highest qualification. The high educational baseline is noteworthy, as more educated users tend to exhibit heightened scrutiny toward automated systems, potentially moderating satisfaction outcomes. Regarding online service engagement, the majority (52.0%) reported frequent usage, defined as daily or multiple times per day, whereas 32.0% indicated moderate use and 16.0% reported infrequent engagement. This usage pattern aligns with the age profile and reinforces the relevance of the sample for evaluating chatbot interfaces in digital environments. Collectively, these characteristics frame a respondent pool that is young, male-dominated, educationally advanced, and actively engaged with online platforms—a configuration that may amplify the observed relationships between personalization features and satisfaction metrics.

4.2 Relationship Between Chatbot Effectiveness And Customer Satisfaction.

Hypothesis

H₀: There is no significant association between gender and overall satisfaction level with chatbot-based customer support.

H₁: There is a significant association between gender and overall satisfaction level with chatbot-based customer support.

Gender	Low	Medium	High	Total
Female	2	6	30	38
Male	10	22	30	62
Total	12	28	60	100

Table 2. Crosstabulation of Gender by Overall Satisfaction Level

Source: Survey data

The crosstabulation indicates differences in overall satisfaction levels between male and female respondents. Among the 38 female respondents, a majority (30 respondents, 78.9%) reported a high level of satisfaction with chatbot-based customer support. Only 2 respondents (5.3%) reported low satisfaction, while 6 respondents (15.8%) indicated a medium level of satisfaction.

Among the 62 male respondents, 30 respondents (48.4%) reported high satisfaction, 22 respondents (35.5%) reported medium satisfaction, and 10 respondents (16.1%) reported low satisfaction. Compared to females, a greater proportion of males reported medium and low levels of satisfaction. The results suggest that female respondents tend to be more satisfied with chatbot-based customer support services than male respondents. While high satisfaction was the dominant response category for both genders, the proportion of highly satisfied users was considerably higher among females.

Test	χ^2	df	p
Pearson Chi-Square	6.429	2	.040

Table 3. Chi-Square Test Results for Gender and Overall Satisfaction Level

Note: $p < .05$.

A Pearson Chi-Square test was conducted to examine whether gender is associated with overall satisfaction levels regarding chatbot-based customer support. The test yielded a chi-square value of $\chi^2 = 6.429$ with 2 degrees of freedom and a p-value of 0.040. Since the obtained p-value (0.040) is less than the significance level of 0.05, the null hypothesis is rejected. Therefore, there is a statistically significant association between gender and overall satisfaction with chatbot-based customer support.

4.3 Pearson Correlation Analysis of Chatbot Attributes and Customer Satisfaction

A Pearson product-moment correlation coefficient was computed to assess the bivariate relationships among general perception of chatbots, chatbot effectiveness, chatbot personalization, and overall customer satisfaction. The correlation

matrix, presented in Table 1, revealed a series of significant positive associations among all variable pairs. A strong positive correlation emerged between general perception and chatbot effectiveness, $r(98) = .678$, $p < .05$, indicating that participants who held more favorable general views toward chatbots also rated their effectiveness more highly. The relationship between general perception and chatbot personalization was moderate in magnitude, $r(98) = .473$, $p < .05$, suggesting that positive global attitudes corresponded with heightened perceptions of personalized interactions. Additionally, chatbot effectiveness and personalization demonstrated a strong positive correlation, $r(98) = .599$, $p < .05$, implying that users who perceived chatbots as effective also tended to experience them as more personalized, reflecting overlapping evaluative dimensions.

Variable Pair	r	p	N
General Perception ↔ Chatbot Effectiveness	.678	< .05	100
General Perception ↔ Chatbot Personalization	.473	< .05	100
Chatbot Effectiveness ↔ Chatbot Personalization	.599	< .05	100
General Perception ↔ Overall Satisfaction	.489	< .05	100
Chatbot Effectiveness ↔ Overall Satisfaction	.608	< .05	100
Chatbot Personalization ↔ Overall Satisfaction	.708	< .05	100

Table 4. Pearson's Correlation Summary

Note: r represents Pearson's correlation, and N is sample size. $p < .05$.

With respect to overall satisfaction, all three predictor variables yielded significant positive correlations. General perception showed a moderate positive association with satisfaction, $r(98) = .489$, $p < .05$, whereas chatbot effectiveness exhibited a stronger correlation, $r(98) = .608$, $p < .001$. The most robust relationship was observed between chatbot personalization and overall satisfaction, $r(98) = .708$, $p < .05$, accounting for approximately 50% of the shared variance between these two constructs. This gradient in correlation magnitudes—progressively increasing from general perception to effectiveness to personalization—suggests that although a positive general orientation toward chatbots contributes to satisfaction, the functional performance attributes, particularly the capacity for individualized responses, carry greater explanatory weight in shaping user satisfaction outcomes. Collectively, these findings warrant rejection of the null hypothesis for all variable pairs, as each correlation attained statistical significance at the .01 level, thereby supporting the alternative hypothesis of positive relationships between chatbot attributes and customer satisfaction.

4.4 Regression Analysis: Predictors of Customer Satisfaction

A multiple regression analysis was conducted to evaluate the collective and individual contributions of three predictor variables—general perception, chatbot effectiveness, and chatbot personalization—on customer satisfaction. The overall model was statistically significant, $F(3, 96) = 40.295$, $p < .001$, and accounted for a substantial portion of the variance in the dependent variable, $R^2 = 0.557$. Thus, the model explained 55.7% of the variability in customer satisfaction scores.

Predictor Variable	Beta (β)	p
General Perception	0.076	0.415
Chatbot Effectiveness	0.241	0.021
Chatbot Personalization	0.528	< .05

Table 5. Multiple Regression Coefficients for Predictors of Customer Satisfaction

Note. Dependent variable: Customer satisfaction. $R^2 = .557$, $F(3, 96) = 40.295$, $p < .05$.

Examination of individual predictor contributions revealed differential patterns of significance. As summarized in Table 1, chatbot personalization emerged as the strongest and most significant predictor ($\beta = 0.528$, $p < .05$). Chatbot effectiveness also demonstrated a significant unique contribution to the model ($\beta = 0.241$, $p = .021$). In contrast, general perception did not reach statistical significance as a predictor ($\beta = 0.076$, $p = .415$), suggesting that, when accounting for the other variables in the model, general perceptions of chatbots do not independently influence satisfaction outcomes.

4.5 Discussion

The demographic composition of the sample reflects a respondent pool predominantly situated within the 18–24 years age bracket, comprising 64% of participants, with more than half reporting frequent engagement with online services. This age distribution corresponds with the elevated digital literacy rates characteristic of Ernakulam district, thereby positioning the sample as broadly representative of the region's technology-oriented consumer base. The gender distribution, with males constituting 62% of respondents, introduces a consideration for interpreting gender-based satisfaction differences, as the disproportionate representation of male participants may have shaped the observed associations. Educational attainment emerged as a salient characteristic, with 56% of respondents holding postgraduate qualifications. This elevated educational baseline carries particular relevance for chatbot interactions, given that more educated users tend to apply heightened scrutiny and elevated expectations toward automated systems. This dynamic may explain why personalization assumed primacy as the most influential predictor of satisfaction—educated consumers likely demand contextually aware, nuanced responses rather than formulaic, generic interactions. The predominance of middle-income respondents (48%) further situates the findings within a specific socioeconomic context, suggesting that the observed satisfaction patterns apply most directly to consumers with moderate discretionary income who regularly engage with digital service platforms.

The chi-square analysis established a significant association between gender and satisfaction levels, with female respondents reporting substantially higher satisfaction (78.9% high satisfaction) compared to their male counterparts (48.4% high satisfaction). This disparity suggests that gender may influence user expectations, tolerance thresholds, or interaction styles during chatbot engagements. The correlation and regression analyses provided deeper insight into the mechanisms underpinning satisfaction. The Pearson correlations demonstrated a progressive strengthening from general perception ($r = .489$) to effectiveness ($r = .608$) to personalization ($r = .708$), indicating that although general attitudes contribute meaningfully, specific functional attributes exert greater influence. The regression model accounted for 55.7% of satisfaction variance, with personalization emerging as the dominant predictor ($\beta = 0.528$, $p < .001$), followed by effectiveness ($\beta = 0.241$, $p = .021$), whereas general perception failed to achieve statistical significance ($\beta = 0.076$, $p = .415$). This pattern indicates that during satisfaction evaluations, users prioritize concrete experiential factors—particularly the system's capacity to deliver personalized, contextually relevant responses—over global predispositions toward chatbots. The practical implication for organizations is clear: strategic investments should concentrate on personalization capabilities, including user history integration, contextual awareness, and adaptive response generation, rather than attempting to improve general system perceptions in isolation. The study contributes empirical evidence from a digitally mature regional context, offering actionable guidance for chatbot deployment strategies in technology-intensive markets.

5.CONCLUSION

This study concludes that chatbots play a significant role in enhancing customer support experiences, particularly when they deliver effective and personalized interactions. The findings reveal that personalization is the strongest predictor of customer satisfaction, followed by chatbot effectiveness, indicating that customers value context-aware and tailored responses more than general perceptions of chatbot technology. The statistical analyses further demonstrate that satisfaction levels differ across genders, with female respondents reporting higher satisfaction than male respondents. These results suggest that organizations should prioritize investments in advanced personalization features, adaptive response generation, and user-specific service customization to improve customer experiences. A major limitation of the study is the reliance on a relatively homogeneous sample dominated by young, highly educated respondents from a single regional context, which may restrict the generalizability of the findings to broader populations. Despite this limitation, the study provides meaningful insights into the factors driving chatbot satisfaction in digitally mature markets. Future research should examine more diverse demographic groups, compare industry-specific chatbot implementations, and explore the impact of emerging generative AI chatbots on long-term customer loyalty and engagement.

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