



International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.206

Volume 9, Issue 3, March 2026



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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The Influence of Artificial Intelligence Chatbots on Customer Satisfaction and Service Experience in E-Commerce

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ABSTRACT: Artificial Intelligence (AI) chatbots are transforming customer service in e-commerce platforms through automated, real-time, and personalized interactions. While they improve operational efficiency and accessibility, their influence on customer satisfaction and service experience requires empirical examination. This study analyzes how chatbot attributes—accuracy, responsiveness, personalization, availability, and ease of interaction—affect customer satisfaction. Using a descriptive research design and primary data from 102 respondents, statistical tools including Chi-Square Test and Weighted Mean Rank Analysis were applied. Findings reveal that chatbot accuracy is the most influential determinant of customer satisfaction, followed by responsiveness and personalization. Although chatbots enhance efficiency, limitations in emotional intelligence persist. The study recommends hybrid AI-human systems to achieve sustainable service excellence.

KEYWORDS: Artificial Intelligence, Chatbots, Customer Satisfaction, Service Experience, E-Commerce

I. INTRODUCTION

The rapid expansion of digital commerce has increased the demand for efficient and responsive customer service systems. E-commerce platforms now integrate Artificial Intelligence (AI) chatbots to automate customer interactions related to order tracking, refunds, payments, and product queries. These chatbots utilize Natural Language Processing (NLP) and machine learning algorithms to simulate human-like conversations and provide instant assistance.

Despite operational advantages such as cost efficiency and 24/7 availability, chatbots often lack contextual awareness and emotional intelligence. Customers sometimes experience repetitive or irrelevant responses, particularly in complex service situations. Therefore, assessing how chatbot features influence customer satisfaction and service experience is essential for long-term sustainability in digital commerce. This study statistically examines the relationship between chatbot attributes and customer comfort levels.

II. REVIEW OF LITERATURE

Previous research highlights that AI chatbots significantly enhance service speed and efficiency in e-commerce environments. Studies by **Austerlind and Lian (2023)**, **Zahara et al. (2024)**, and **Batool (2025)** indicate that responsiveness, ease of use, and availability positively influence customer satisfaction. **Rasheed et al. (2025)** and **Srilangameenakshi and Verma (2025)** further confirm that chatbot adoption improves customer engagement and conversion rates. Technology Acceptance Model (TAM) and UTAUT-based studies show that perceived usefulness and ease of use significantly impact continued usage intention.

However, literature also identifies limitations. **Misichia et al. (2022)** and **Gupta (2025)** argue that chatbots underperform in emotionally sensitive situations compared to human agents. **Shahbandi (2025)** and **Brun et al. (2025)** emphasize the need for emotion-aware AI systems. Technical advancements such as retrieval-augmented NLP models



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(Patel, 2025) improve response accuracy, yet researchers suggest hybrid AI-human systems for complex interactions. Overall, while functional efficiency is well studied, experiential dimensions such as trust and emotional comfort require deeper empirical exploration creating a research gap addressed by this study.

III. RESEARCH METHODOLOGY

Research Design: Descriptive research design.

Data sources

Primary data collected via structured questionnaire (Google Forms); secondary data from journals and research articles.

Sample Size: 102 respondents.

Sampling Technique: Convenience sampling.

Tools Used:

- Percentage Analysis
- Chi-Square Test
- Rank Analysis (Weighted Mean Method)

Software: Microsoft Excel and SPSS.

IV. RESULTS AND DISCUSSION

4.1 Percentage analysis

Percentage analysis is one of the simplest and most widely used statistical techniques in research. It converts numerical data into percentage values, which makes comparison and interpretation easier. This method is especially useful in survey-based studies where responses need to be summarized clearly. In this study, percentage analysis was applied to interpret respondents' demographic details and their opinions related to greenwashing, influencer marketing, subscription models, and consumer trust.

Table 4.1.1 The impact of chatbot responsiveness and accuracy

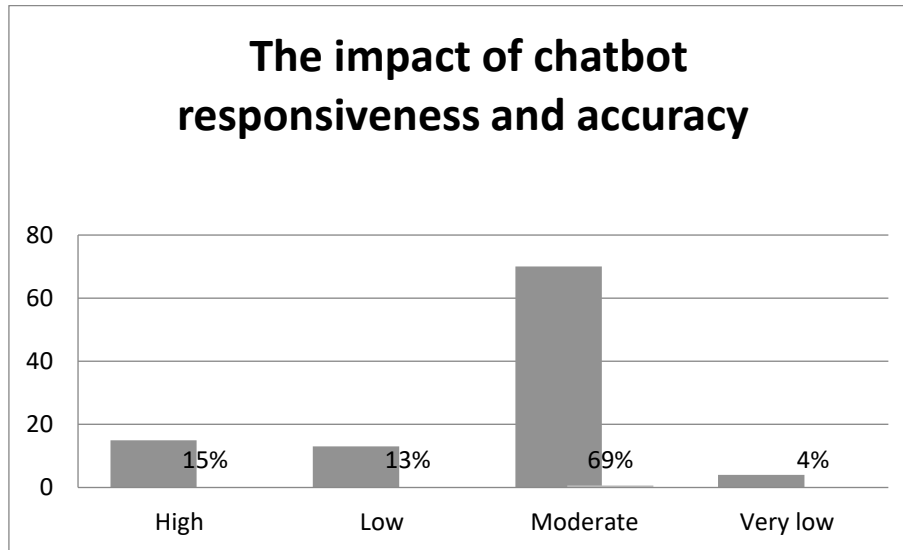
Row Labels	FREQUENCY	PERCENTAGE
High	15	15%
Low	13	13%
Moderate	70	69%
Very low	4	4%
Grand Total	102	100%



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Chart 4.1.1 The impact of chatbot responsiveness and accuracy



INTERPRETATION: A majority (69%) rated the impact as moderate, while 15% rated it high and 13% low. This indicates that chatbot performance influences customer experience but not strongly for most users.

The impact assessment shows that 69% rate it as moderate, compared to smaller percentages rating high or low.

4.2 Chi-Square Analysis

The significance level was fixed at 5% ($\alpha = 0.05$).

Age Group and Interaction

$$\chi^2 = 110.631, p < 0.001$$

A significant association exists. Younger respondents interact more frequently with AI chatbots, indicating higher digital adaptability.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	110.631 ^a	10	<.001
Likelihood Ratio	19.707	10	.032
N of Valid Cases	102		

a. 13 cells (72.2%) have expected count less than 5. The minimum expected count is .01.

Shopping Frequency and Perception of Reduced Human Contact

$$\chi^2 = 19.660, p = 0.479$$

No significant association. Shopping frequency does not influence perception regarding chatbot replacement of human agents.

Personalization and Comfort Level

$$\chi^2 = 118.782, p < 0.001$$

Significant association. Personalized responses increase customer comfort and emotional engagement.

Monthly Income and Shopping Frequency

$$\chi^2 = 127.403, p < 0.001$$

Significant relationship. Higher income groups shop more frequently.

Accuracy and Comfort Level

$$\chi^2 = 156.973, p < 0.001$$

Strongest relationship observed. Perceived accuracy significantly enhances comfort and trust.



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4.3 Rank Analysis (Weighted Mean Method)

Feature	Mean Score	Rank
Accuracy	3.784	1
Responsiveness	3.725	2
Personalization	3.588	3
Availability	3.549	4
Ease of Interaction	3.411	5

Interpretation: Accuracy is the most critical determinant of satisfaction, followed by responsiveness. Functional reliability outweighs interface simplicity. Customers prioritize correct and trustworthy information over mere speed or design convenience.

V. LIMITATIONS OF THE STUDY

- Limited sample size (102 respondents):** The study's sample size is relatively small, which may not be representative of the larger population, potentially leading to biased or non-generalizable results.
- Use of convenience sampling:** Convenience sampling can introduce selection bias, as participants are chosen based on ease of access rather than random selection, which may not accurately represent the target population.
- Dominance of younger age group responses:** The study's respondents were predominantly from a younger age group, which may skew the results towards their preferences and experiences, potentially overlooking the perspectives of other age groups.
- Subjective perception-based data:** The study relies on respondents' subjective perceptions, which can be influenced by personal biases, experiences, and emotions, potentially affecting the accuracy and reliability of the data.
- Limited to text-based chatbots in e-commerce sector:** The study focuses solely on text-based chatbots in the e-commerce sector, limiting the generalizability of the findings to other types of chatbots (e.g., voice-based) or industries, which may have different characteristics and user expectations.

VI. CONCLUSION AND FUTURE WORK

The study concludes that Artificial Intelligence (AI) chatbots play a significant role in enhancing customer service efficiency within e-commerce platforms. The statistical analysis reveals that accuracy and responsiveness are the most influential factors affecting customer satisfaction, with accuracy emerging as the strongest determinant of comfort and trust. While personalization and 24/7 availability contribute positively to the service experience, customers primarily prioritize reliable and correct information over speed or interface simplicity. The Chi-Square results confirm that demographic factors such as age influence chatbot interaction, and that personalization and perceived accuracy significantly impact user comfort levels. However, the findings also indicate that customer satisfaction remains moderate rather than exceptionally high, highlighting limitations in emotional intelligence and complex issue handling. Overall, AI chatbots improve convenience and operational efficiency, but their effectiveness can be strengthened



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through enhanced accuracy, better personalization, and integration with human support systems to achieve a balanced and sustainable customer service model.

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