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Customer Perception and Satisfaction with AI Virtual Assistants in E-Commerce Platforms

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ABSTRACT

AI- powered virtual assistants (VAs) has been adopted rapidly and transformed customer interaction within e-commerce platforms, immediate responses, offering personalized support and enhanced service convenience. This paper investigates customer perception and satisfaction towards AI virtual assistants by examining the important factors such as perceived usefulness, ease of use, reliability, personalization, and trust. Structured questionnaire administered to e-commerce users was distributed to 150 respondents to analyze the influence of the above factors on overall customer satisfaction and continued usage intentions. The study employed descriptive statistics, correlation analysis, and multiple regression techniques to assess the relationship between perception variables and overall customer satisfaction. The findings helped us to understand the positive customer perception of VA performance specially in terms of accuracy, responsiveness and problem-solving ability majorly increases the level of satisfaction. But issues related to privacy, miscommunication and lack of human-like understanding still limit customer trust in AI based interactions. This study provides guidelines for e-commerce companies to optimize virtual assistant design, improve customer experience and strengthen engagement strategies. In this paper implications for practice and future research directions are also discussed.

Keywords: Customer Perception, Artificial Intelligence, Virtual Assistants, Customer Satisfaction, E-Commerce, Customer Experience, Personalization, Service Quality, User Trust.

INTRODUCTION

The rapid growth of e-commerce has intensified the need for efficient, responsive, and customer-centric digital service solutions. AI-powered virtual assistants (VAs) have emerged as a transformative tool capable of addressing customer queries, offering personalized recommendations, and improving overall service convenience. These assistants are increasingly integrated into platforms such as Amazon, Flipkart, Myntra, and Meesho to support customer interaction and enhance purchase decision-making. As consumer expectations for speed, accuracy, and personalization increase, virtual assistants play a vital role in shaping customer experience and satisfaction. However, despite their widespread adoption, customer responses toward AI-based interactions vary significantly. Some users appreciate instant responses and convenience, while others express concerns about privacy, misinterpretation, and lack of human-like understanding. Given the rising dependence on AI in digital retail, it becomes essential to understand how customers perceive virtual assistants and how these perceptions influence their satisfaction and continued use. This study, therefore, investigates the key determinants of customer satisfaction with AI-powered virtual assistants in e-commerce platforms by examining factors such as perceived usefulness, ease of use,

reliability, personalization, and trust. Understanding these relationships will help businesses enhance virtual assistant design and improve the overall customer experience.

LITERATURE REVIEW

Artificial Intelligence (AI) has significantly reshaped customer interaction patterns in e-commerce, with virtual assistants (VAs) becoming an integral part of digital service delivery. These AI-driven systems employ natural language processing to simulate human-like conversations, enabling instant responses, improved convenience, and continuous availability. Prior studies emphasise that virtual assistants enhance operational efficiency and streamline customer support, thereby strengthening overall customer experience in online platforms (Gnewuch et al., 2018). As customers increasingly seek quick and accurate information, the perceived usefulness of virtual assistants emerges as a critical factor influencing satisfaction. According to the Technology Acceptance Model (TAM), perceived usefulness strongly affects user acceptance and engagement, particularly when virtual assistants help users make informed decisions and resolve queries effectively (Davis, 1989).

Ease of use is another determinant widely discussed in literature, as intuitive and user-friendly interfaces reduce cognitive effort and improve the overall interaction quality. Research shows that when virtual assistants are easy to navigate and understand, users are more likely to adopt and continue using them (Venkatesh & Davis, 2000). Reliability and accuracy also play a central role in shaping customer trust and perception. Studies indicate that customers evaluate virtual assistants based on their ability to interpret queries correctly, provide accurate information, and function consistently across different tasks (Brandtzaeg & Følstad, 2017). Inaccurate or irrelevant responses often lead to frustration and reduce overall satisfaction, thereby limiting the perceived value of AI-based interactions.

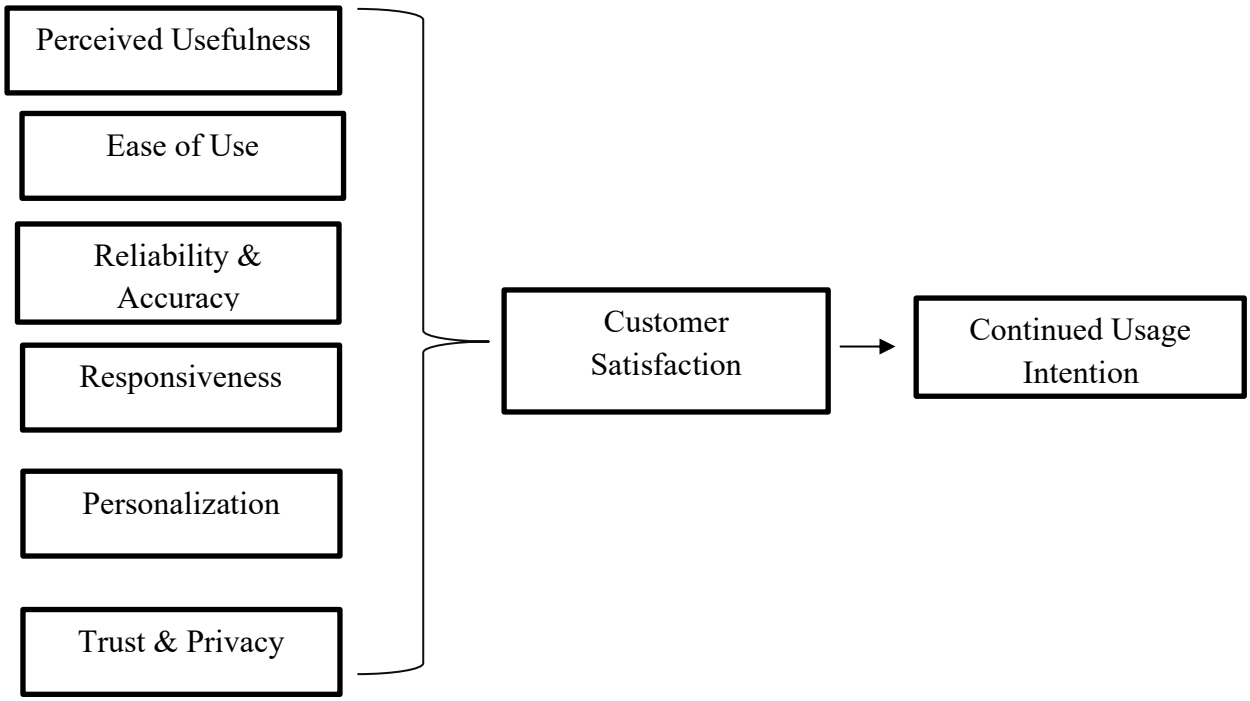
Another important dimension highlighted in previous literature is personalization, which enhances customer engagement by tailoring recommendations and responses to individual preferences. Personalized interactions create a sense of relevance and increase the likelihood of repeat usage, as supported by research on online shopping behaviour (Lin & Bhattacherjee, 2008). However, personalization also raises concerns related to data privacy and trust. Customers often feel uncertain about how their personal information is stored, processed, or utilised by AI systems, which can negatively impact trust and willingness to interact with virtual assistants (Lankton et al., 2015). Trust, therefore, becomes a decisive factor influencing satisfaction and adoption, as users prefer technologies that appear transparent, credible, and secure.

Overall, existing literature suggests that customer satisfaction with AI-powered virtual assistants is shaped by multiple perception factors—usefulness, ease of use, reliability, personalization, and trust. Studies consistently show that when virtual assistants perform accurately, respond promptly, and demonstrate problem-solving ability, customers express higher satisfaction and stronger intentions to continue using them (McLean & Wilson, 2019). However, concerns regarding privacy breaches, miscommunication, and lack of human touch remain significant barriers to building long-term trust in AI systems. This review highlights the need for ongoing improvements in virtual assistant design to enhance customer experience, reduce trust-related concerns, and support effective human–AI interaction within e-commerce environments.

Theoretical Framework:

The theoretical model for this study is primarily based on three widely recognized frameworks in technology and service research:

1. Technology Acceptance Model (TAM) – Davis (1989)
   Explains how perceived usefulness and perceived ease of use influence user acceptance and satisfaction.
2. SERVQUAL Framework – Parasuraman et al. (1988)
   Explains how service quality dimensions such as reliability, responsiveness, and assurance contribute to customer satisfaction.
3. Trust Theory in Technology Adoption – Lankton et al. (2015)
   Explains the role of trust and perceived privacy in shaping customer willingness to interact with AI systems.



The proposed theoretical model combines TAM, SERVQUAL, and Trust Theory to explain customer satisfaction with AI virtual assistants in e-commerce. TAM highlights that perceived usefulness and ease of use shape positive attitudes toward adopting VAs. SERVQUAL adds that reliability, accuracy, and responsiveness determine perceived service quality, while personalization enhances relevance and engagement. Trust Theory emphasizes that trust and perceived privacy are essential for customer acceptance, as users are sensitive to data security in AI interactions. Together, these factors influence overall customer satisfaction, which subsequently drives continued usage intention of AI-powered virtual assistants on e-commerce platforms.

Objectives of the Study

1. To examine customer perception toward AI-powered virtual assistants in e-commerce platforms.
2. To identify the influence of perceived usefulness, ease of use, reliability, personalization, and trust on customer satisfaction.
3. To assess the relationship between virtual assistant performance and continued usage intentions among customers.

4. To provide recommendations for improving virtual assistant design and customer experience in e-commerce.

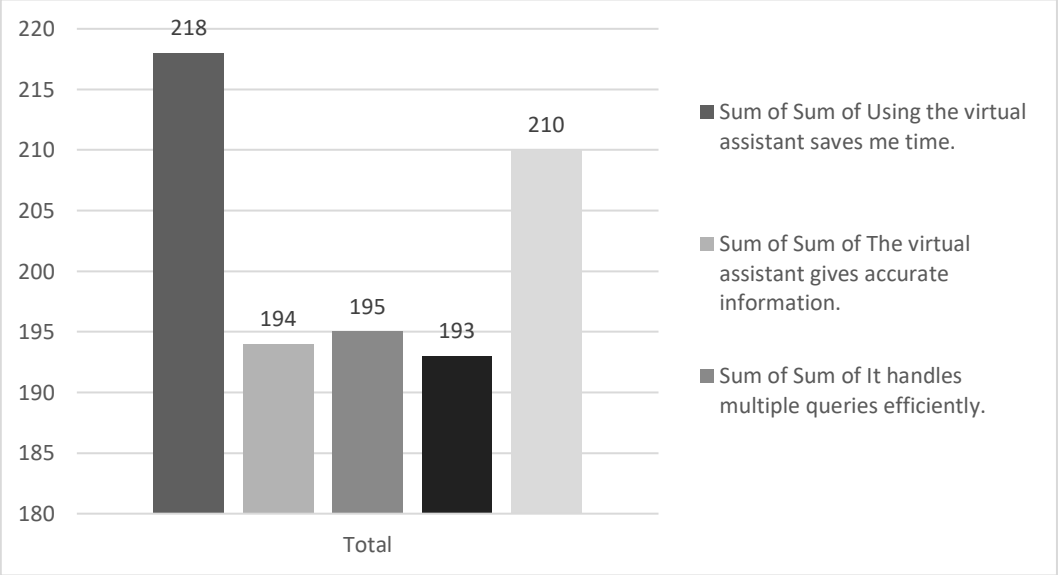
Research Methodology

The study adopts a quantitative research design to analyze customer perceptions and satisfaction related to AI virtual assistants. Primary data was collected using a structured questionnaire developed based on validated scales from previous studies. The questionnaire included sections on customer perception, virtual assistant performance, and satisfaction. A convenience sampling method was used to collect responses from users who had interacted with virtual assistants on e-commerce platforms. A total of 150 respondents participated in the study. Active e-commerce users familiar with AI virtual assistants such as chatbots or automated help systems.

Data Analysis Tools: Descriptive statistics is used to summarize respondent profiles, Correlation analysis helped to examine relationships between variables, Multiple regression analysis is used to determine the influence of perception factors on customer satisfaction

DATA ANALYSIS

Pivot Table- Key Performance Insights of Virtual Assistants in E-Commerce



The results highlight that speed and time efficiency are the strongest strengths of virtual assistants, significantly shaping positive customer experience. However, accuracy and multi-query handling, while satisfactory, may need enhancement to ensure a more reliable and seamless interaction. For e-commerce platforms, this suggests focusing on improving response accuracy and system robustness to further elevate customer satisfaction.

Descriptive Statistics Table

Mean	3.278689
Standard Error	0.142444
Median	3
Mode	4
Standard Deviation	1.112522

Sample Variance	1.237705
Kurtosis	-0.27313
Skewness	-0.58076
Range	4
Minimum	1
Maximum	5

The descriptive analysis reveals that customer satisfaction with virtual assistants in e-commerce platforms is **moderately positive**, with a mean of 3.28 and a mode of 4. While most users express satisfaction, the standard deviation of 1.11 and the full rating range (1 to 5) indicate that experiences vary significantly among respondents. The negative skewness suggests a higher concentration of positive ratings, while the near-normal kurtosis implies a balanced distribution without extreme deviations. Overall, the data shows that although virtual assistants are generally well-received, improvements are still needed to enhance the experience for all users.

Regression Analysis

Regression Statistics	
Multiple R	0.841
R Square	0.708
Adjusted R Square	0.657
Standard Error	0.651

The regression analysis demonstrates that time-saving, personalization, trust, and privacy perceptions strongly influence overall customer satisfaction with virtual assistants in e-commerce platforms. With an R^2 of **70.86%**, the model shows high explanatory power, indicating that most of the variation in satisfaction can be predicted from these factors. The strong correlation (Multiple R = 0.84) reinforces that positive perceptions of performance and security significantly shape user satisfaction. The results highlight that enhancing personalization, maintaining user trust, ensuring privacy, and delivering time-efficient services are critical for improving satisfaction levels and strengthening user engagement with AI virtual assistants.

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	9	52.6201	5.846677	13.77774	6.77E-11
Residual	51	21.6422	0.424357		

The ANOVA results confirm that the regression model is **statistically significant**. The predictors time-saving, personalization, trust, privacy, and other perception variables collectively explain a substantial portion of the variance in overall customer satisfaction with virtual assistants. The large F-value and extremely low p-value indicate that the model fit is strong, and the likelihood of these results occurring by chance is negligible. This validates the importance of perception-based factors in shaping user satisfaction with AI-powered virtual assistants in e-commerce platforms.

Results and Discussion:

The combined findings reveal that speed, time efficiency, and accuracy are the strongest performance attributes influencing user evaluations of virtual assistants. Respondents positively acknowledged that VAs save time and resolve queries quickly, making efficiency a core driver of satisfaction. However, factors such as accuracy of responses, multi-query handling, and personalization received moderate scores, suggesting room for improvement. Trust and privacy concerns though significant predictors still act as barriers for some users due to uncertainties related to data security and human-like understanding.

The results align with the Technology Acceptance Model (TAM), indicating that perceived usefulness and ease of use remain central to customer satisfaction. The SERVQUAL dimensions of reliability and responsiveness emerge strongly in user evaluations, showing that customers expect consistent, accurate, and fast interactions from AI systems. Trust Theory also finds support through the significance of privacy and data security perceptions. The strong regression and ANOVA results demonstrate that virtual assistants significantly influence customer experience within e-commerce platforms. However, the presence of variability and moderate descriptive scores suggests that current AI systems still lack the sophistication and contextual understanding that human agents provide. To enhance adoption, companies must focus on improving the accuracy of responses, contextual personalization, and transparency in data handling.

Conclusion

The study concludes that time saving, personalization, trust, and privacy play a crucial role in shaping overall customer satisfaction with virtual assistants on e-commerce platforms. Among these, time saving and speed emerged as the strongest strengths of virtual assistants, significantly enhancing customer experience. The regression results, showing an R^2 of 0.709, indicate that these four variables collectively explain over 70% of the variance in customer satisfaction highlighting their strong predictive power. Although users find virtual assistants fast and convenient, the results also show that accuracy and the ability to handle multiple queries need improvement. Enhancing these aspects can strengthen the reliability and user acceptance of virtual assistants, thereby elevating the overall digital shopping experience.

Managerial Implications and Future Scope

The findings of the study highlight that e-commerce platforms must focus on enhancing the accuracy, personalization, and robustness of virtual assistant systems to strengthen customer satisfaction. While speed and time efficiency are already strong features, platforms need to invest in improving multi-query handling and contextual understanding. Strengthening privacy and data security is essential to build user trust, and continuous monitoring of customer feedback can guide ongoing improvements. Overall, the results suggest that a strategic focus on technological refinement and user-centered design will significantly elevate the effectiveness of virtual assistants.

Future research can expand on this study by incorporating additional variables such as demographic differences, user experience levels, and emotional factors influencing satisfaction. Comparative studies across different e-commerce platforms and longitudinal studies over time can offer deeper insights into evolving customer expectations. Integrating behavioral data can validate the findings more rigorously, while examining differences between voice and text-based assistants may uncover new dimensions of user interaction. Further exploration of AI ethics and transparency can also contribute to a more holistic understanding of trust in virtual assistants.

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