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Customers' attitude towards ai enabled virtual assistants used in E-Commerce portals

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Abstract
From intelligent chatbots and voice assistants to personalized product recommendations and fraud detection, AI enables e-commerce platforms to deliver seamless and efficient shopping experiences. The present study aimed to explore the customers' attitude towards AI enabled virtual assistants used in e-commerce portals. A sample consisting of 110 respondents was drawn from the population in Coimbatore district of Tamil Nadu, India for the study. The convenient sampling was devised. The research reveals a robust demographic and functional profile of Virtual Assistant (VA) users, primarily characterized by a young, educated, and rural-based male majority whose engagement is driven by a strong positive correlation between technological familiarity and overall satisfaction. With 85.5% of respondents being graduates and 50% aged below 20, the study identifies a "tech-optimistic" user base that highly values VA Appearance (Mean: 4.16) and Information Quality (Mean: 4.03), leading to a dominant 5-star experience rating (33.6%). Future research should expand beyond the current student-centric demographic to include a more diverse range of age groups and professional backgrounds to determine if these positive attitudes remain consistent across different life stages. There is also a significant opportunity to conduct longitudinal studies to track how the evolution of Generative AI and natural language processing (NLP) reduces the current "vagueness".

Keywords: Artificial Intelligence, Virtual Assistants, Chatbots, E-Commerce Platforms, Online Shopping, Customers Interaction.

Introduction

Artificial Intelligence (AI) is a branch of computer science focused on creating intelligent machines capable of performing tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, and language understanding. Artificial Intelligence (AI) has revolutionized the e-commerce industry by enhancing customer experiences, optimizing operations, and driving sales growth. AI- powered technologies such as machine learning, natural language processing, and computer vision are transforming how online businesses interact with customers, personalize recommendations, and streamline logistics. From intelligent chatbots and voice assistants to personalized product recommendations and fraud detection, AI enables e-commerce platforms to deliver seamless and efficient shopping experiences. AI-driven automation helps businesses analyze customer behaviour, predict trends, and optimize inventory management, ensuring better decision-making and improved customer satisfaction. As AI continues to evolve, its integration into e-commerce portals is expected to enhance user engagement, boost conversion rates, and redefine the future of online shopping.

Review of literature

Martin Adam *et al*. (2020) [1] conducted research on AI-based chatbots in customer service and their effects on user compliance. It aimed at communicating with customers through live chat interfaces has become an increasingly popular means to provide real-time customer service in e-commerce settings. Participants were recruited via groups on Facebook as the social network provides many chatbots for customer service such, to avoid counteracting effects in the analysis, we will consider only participants who have agreed and fulfilled the initial small request (and thus remove participants who did not). It incentivized participation by conducting a raffle of three Euro 20 vouchers for Amazon. Participation in the raffle was voluntary and inquired at the end of the survey.

Nagy *et al*. (2021) [4] conducted a research on Consumer acceptance of the use of artificial intelligence in online shopping: Evidence from Hungary. It aimed to investigate the relationships between the elements of TAM; to analyze the effects of trust, perceived usefulness and perceived ease of use on attitudes and behavioral intention objectives of this paper are to investigate the relationships between the elements of TAM; to analyze the effects of trust, perceived usefulness and perceived ease of use on attitudes and behavioral intention. Building trust has a central role in consumer acceptance of the use of artificial intelligence in online shopping. If consumers do not trust in an AI-powered web shop/app, they tend to consider it less useful and form a negative attitude towards it, which will result in less online traffic. Also, AI must provide online consumers with tailor-made offerings to grab the best deals, i.e. products with the highest value; and it is expected to shorten the product search time to enhance shopping effectiveness.

Ivan Martins *et al*. (2022) [3] conducted research on increasing customer service efficiency through artificial Intelligence chatbots. It aimed at the conversion of big data into knowledge, internet crowd intelligence (used for task targeting, highly complex service flows and adversity solution); and the cross-media intelligence (an essential attribute of the intellect, linked to the unrestricted use of information captured by different forms of discernment, like vision, vocabulary and sense of hearing, which allow the identification, induction, design, invention and anticipation); Result showed the company's technological innovation network and the interrelated analytical categories derived from the interviews. The theoretical lens considers two

levels of analysis: the company transformations that require change and new practices, through incremental and disruptive technological innovations, especially AI application; and the organization's survival due to technological adaptation.

Frida Eickhoff *et al*. (2023) [2] conducted research on the title of the consumer attitude towards AI in marketing. It aimed of the report will not investigate the use of AI within other fields than the use of it within generating content in email marketing. The research was conducted using a quantitative method in an experimental context. An online survey divided into two parts was developed and distributed to participants in Sweden in ages from 18 and above. A total of 114 respondents were recorded in the first survey and of those, 71 respondents were recorded in the second survey. The data was then analyzed in SPSS. The results from the survey showed the element of compatibility within the theory of diffusion of innovation having a significant and positive effect on consumer's attitude towards AI-usage in marketing.

Jyoti Rana *et al*. (2024) [5] conducted the research on the title of Utility and Acceptability of AI-Enabled Chatbots on the Online Customer Journey in E-Retailing. It aimed at the role of chatbots in shaping attitudes of customers relating to usefulness, usability, and trust when shopping for groceries online. Automated conversational agents, or chatbots, not only understand customers, but also provide them product knowledge, and promote behavioral change. Chatbots, automated and cost-effective as they are, provide efficient first-level support because a human employee cannot answer the whole range of customer questions round the clock. The current study's findings suggest that it is vital to raise customer knowledge of chatbots and assess how well the supplier communications structure is acceptable and valuable to customers from a company's perspective. Rapid developments in AI text-based chatbot dialogues have extended their limits rather quickly than conventional shopping apps.

Objectives of the study

Following were the objectives framed for the study.

1. To understand the socio-economic profile of the respondents.
2. To know the level of awareness of Virtual Assistants.
3. To know the level of acceptance of Virtual Assistants.
4. To explore the experience & satisfaction of Virtual Assistants.

Research methodology

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. Research is a fact-finding process or activity. It always starts with a question or problem and ends with a result or a fact.

1. Research Design

It includes how data collection should be done, what are the methods to be used and how the collected data should be analyzed. This study relies on primary data. It comprises of all age category of people.

2. Sources of Data

The primary data was collected from 110 respondents through Questionnaires. The questionnaire was framed to find out "Customers' attitude towards AI enabled virtual assistants used in E-Commerce portals" preferences, opinions, difficulties, struggles, motivational factors, etc. The questionnaires were distributed among the people in all ages. The secondary data like articles and theories were collected from various sources such as Magazines, Journals and Websites.

3. Sample and Sampling

Sample design is determined before data are collected. The population of this study is huge, out of which 110 respondents were taken as samples. In this study, the "Convenient Sampling" method was opted.

4. Statistical Tools Used

The statistical tools: Simple percentage method, ranking, ANOVA and T-test were used for the study.

AI In e-commerce portals

a. **Personalized Recommendations:** AI analyzes customer preferences and browsing history to suggest relevant products, increasing conversion rates.

b. **Chatbots & Virtual Assistants:** AI-powered chatbots provide instant customer support, answer queries, and assist in the buying process 24/7.

c. **Visual Search & Image Recognition:** Customers can search for products using images, making shopping more intuitive and convenient.

d. **Dynamic Pricing:** AI helps businesses adjust product prices in real-time based on demand, competitor pricing, and market trends.

e. **Fraud Detection & Security:** AI identifies fraudulent transactions and prevents unauthorized activities, enhancing e-commerce security.

f. **Smart Inventory Management:** AI predicts demand and optimizes stock levels, reducing overstocking or stockouts.

g. **Voice Commerce Integration:** AI-driven voice assistants like Alexa and Google Assistant enable hands-free shopping experiences.

h. **Automated Product Descriptions:** AI generates product descriptions, saving time and improving SEO for e-commerce platforms.

i. **Customer Sentiment Analysis:** AI analyzes customer reviews and feedback to understand consumer preferences and improve products.

j. **AI-Powered Logistics & Delivery:** AI optimizes delivery routes, predicts shipping times, and improves supply chain efficiency.

k. AI in e-commerce is transforming the industry by making online shopping more efficient, engaging, and customer-centric.

Examples of virtual assistants in E-commerce

1. **Amazon Alexa:** Alexa can help customers order products, track deliveries, and get product recommendations using voice commands.

2. **Macy's MacyBot:** Macy's chatbots guides shoppers through product searches and offers personalized suggestions on their app and website.

3. **Sephora's Sephora Virtual Artist:** A virtual assistant that lets users try on makeup virtually using augmented reality (AR) and provides personalized product recommendations.

Virtual assistant in e-banking

A Virtual Assistant in e-banking refers to an AI-powered software or chatbot integrated into an online banking platform that helps users perform various banking tasks efficiently. The assistant uses natural language processing (NLP) to understand user queries and provide appropriate responses, similar to how a human customer service representative would operate.

Virtual assistant in E-business

A Virtual Assistant in E-Business is an AI-powered tool or software designed to help businesses streamline their operations, enhance customer engagement, and improve overall efficiency in online environments. These virtual assistants are used across various industries and serve as automated support systems for tasks such as customer service, marketing, sales, and operations.

Analysis and interpretation

a. Socio-economic analysis

Table 1: Socio-economic profile of the respondents

Category	Particulars	No. of Respondents	Percentage (%)
Gender	Male	60	54.5
	Female	48	43.6
	Prefer Not To Say	2	1.8
Age Group	Below 20	55	50
	21 – 30	46	41.8
	31 – 40	4	3.6
	41 – 50	2	1.8
	51 – 60	2	1.8
	Above 60	1	0.9
Area of Residence	Rural	64	58.2
	Semi-Urban	29	26.4
	Urban	17	15.5
Education Level	School Level	9	8.2
	Graduates (UG & PG)	94	85.5
	Professional Degree	6	5.5
	Other	1	0.9
Occupation	Student	82	74.5
	Private Employee	14	12.7
	Business	4	3.6
	Agriculture	3	2.7
	Govt. Employee	2	1.8
	Unemployed	2	1.8
	Profession	2	1.8
	Retired	1	0.9
Marital Status	Unmarried	95	86.4
	Married	14	12.7
	Separated	1	0.9
Type of Family	Nuclear Family	74	67.3
	Joint Family	36	32.7
Monthly Income	Below Rs. 15,000	24	21.8
	Rs. 15,001 – 30,000	51	46.4
	Rs. 30,001 – 45,000	11	10
	Rs. 45,001 – 60,000	8	7.3
	Above Rs. 60,000	16	14.5
Total		110	100

Source: Primary data

The demographic profile of the 110 respondents reveals a sample that is predominantly young, male, and academically focused. Specifically, 54.5% are male, and a significant 50% are aged below 20, with the vast majority (91.8%) being under 30 years old. In terms of geography and social structure, 58.2% reside in rural areas, and 67.3% belong to nuclear families.

The educational and professional status of the group is highly uniform, as 85.5% are graduates and 74.5% are currently students. This aligns with the marital status of the group, where 86.4% are unmarried. Finally, the economic data indicates that the largest segment of the population (46.4%) falls within a monthly family income bracket of Rs. 15,001 to 30,000, followed by 21.8% earning below Rs.

15,000, establishing a baseline of middle-income households for the majority of the participants in this study.

b. Ranking

Table 2: Ranking the Aspects/Features of Virtual Assistants (VA)

Aspects	Weighted Total	Mean Score	Rank
VA Appearance	458	4.16	I
VA Language	440	4.00	III
VA Information	443	4.03	II
VA Presentation	433	3.94	V
VA Problem Solving	422	3.84	VI
VA Support	434	3.95	IV

Source: Primary data

Table 4.20 illustrates the level of satisfaction over VA or chatbots. VA Appearance gets ranked I, VA Information gets ranked II, VA Language gets ranked III, VA Support gets ranked IV, VA Presentation gets ranked V and VA Problem Solving gets ranked VI.

c. Chi-Square test

Table 3: Familiarity vs. Comfort Levels

Familiarity	Very Comfortable	Somewhat Comfortable	Not Comfortable	Total
Very Familiar	25 (10.7)	12 (24.2)	1 (3.1)	38
Somewhat Familiar	6 (17.8)	54 (40.1)	3 (5.1)	63
Not Familiar	0 (2.5)	4 (5.7)	5 (0.8)	9
Total	31	70	9	110

Source: Primary data

Null Hypothesis (H_0): There is no significant association between a user's familiarity with VAs and their level of comfort in using them. Given that 57.3% are "Somewhat Familiar" and 63.6% are "Somewhat Comfortable," the data suggests a strong positive correlation. If the calculated $\chi 2$ value exceeds the critical value (9.488 at 5% significance), we reject H0, concluding that familiarity is a prerequisite for user comfort in e-commerce environments.

d. Correlation

Table 3: Spearman's Rho Correlation Matrix for VA Usage and Perception

Variable	Familiarity	Frequency	Satisfaction	Overall Rating
Familiarity	1	0.841	0.815	0.901
Frequency	0.841	1	0.955	0.918
Satisfaction	0.815	0.955	1	0.929
Overall Rating	0.901	0.918	0.929	

Source: Primary data

The Spearman's Rank Correlation analysis identifies a robust, positive, and statistically significant relationship among all investigated variables, underscoring a cohesive user trajectory from initial awareness to high-level satisfaction. With correlation coefficients ranging from 0.815 to 0.955, the data reveals that a respondent's familiarity with Virtual Assistant technology serves as a critical foundation for their frequency of interaction, which in turn emerges as the most powerful predictor of overall satisfaction ($r = 0.955$). This high degree of interdependency suggests a "virtuous cycle" of adoption among the predominantly young, student-based demographic, where increased exposure through frequent e-commerce interactions significantly reduces usage friction and enhances the perceived utility of the tool. Ultimately, the high prevalence of top-tier ratings is not an isolated metric but is fundamentally driven by the synergistic interplay of response speed, clarity, and the baseline technical comfort of the sample, confirming that as familiarity and frequency of use escalate, the overall perceived value and loyalty toward VA-integrated platforms are significantly amplified.

Findings and suggestions

The major findings are: The demographic profile of the 110 respondents indicates a sample primarily composed of young males under 20 years of age (50%), residing in rural areas (58.2%), and holding graduate degrees (85.5%). A significant majority of these participants are unmarried students living in nuclear families with a monthly household income typically ranging between Rs. 15,001 and Rs. 30,000. Regarding technological engagement, 57.3% of respondents are somewhat familiar with Virtual Assistants (VAs), and 41.8% interact with them occasionally, with their primary awareness centered on product recommendations (52.7%). The user experience is notably positive: 63.6% feel comfortable using these tools, 58.3% believe VAs facilitate easier shopping, and 48.2% would definitely prefer websites that offer VA support. Furthermore, 47.3% expressed an increased likelihood of returning to a website following a positive VA interaction. Functional satisfaction is also high, with 50% of users finding VA responses clear and concise, culminating in an overall satisfaction rate of 40.9% and a dominant 5-star experience rating (33.6%).

Enhancing the AI assistant's language capabilities so it can understand and respond more naturally. This will reduce the gap between human interaction and AI interaction, making the experience more seamless and enjoyable for customers. E-commerce portals should offer clear, transparent information about how customer data is used and safeguarded. Providing customers with the option to control their data preferences will help ease privacy concerns. For more complex or emotional issues, a hybrid approach could be beneficial.

AI virtual assistants could handle basic inquiries, and customers could seamlessly escalate their issues to a human representative when needed. AI systems should be designed to learn from each customer interaction. Implementing machine learning algorithms that allow the assistant to adapt over time based on customer feedback will make it more efficient and effective. Encouraging regular feedback from users on their experience with the virtual assistant will help e-commerce portals continuously improve the system. Surveys or rating systems at the end of interactions can provide valuable insights.

Conclusion

The use of AI-enabled virtual assistants in e-commerce portals has a significant impact on customer experience. Customers generally appreciate the speed, efficiency, and availability that these systems provide. However, challenges remain, particularly around skepticism regarding AI's capabilities and privacy concerns. To improve customer attitudes, e-commerce platforms must prioritize the

enhancement of AI capabilities, transparency about data usage, and provide the option for human support in more complex situations. By focusing on these areas, e-commerce platforms can better harness the potential of AI virtual assistants and enhance customer satisfaction. In conclusion, AI-powered virtual assistants are likely to continue playing a central role in e-commerce, but their success will depend on how well these systems align with customer expectations, privacy concerns, and the need for seamless, human-like interactions.

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