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Consumer Trust Towards AI Chatbots During Product Recommendation on E-commerce Websites: A Study Among Online Shoppers in Visakhapatnam.

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ABSTRACT :

Artificial Intelligence (AI) chatbots are increasingly used on e-commerce websites to answer product queries and recommend products, but the value of their recommendations depends on how far consumers trust them. This study examines consumer trust towards AI chatbots during product recommendation among online shoppers in Visakhapatnam, and tests how recommendation accuracy, personalization, transparency, and privacy and security relate to consumer trust, and how trust relates to purchase intention. A quantitative, descriptive, analytical and cross-sectional design was used. Primary data were collected through a structured 30-question questionnaire, and 90 usable responses were analysed. Mean scores were 3.74 for recommendation accuracy, 3.92 for personalization, 3.77 for transparency, 3.56 for privacy and security, 3.57 for consumer trust and 3.86 for purchase intention. Pearson correlations with consumer trust were positive and strong: recommendation accuracy ($r = 0.834$), personalization ($r = 0.859$), transparency ($r = 0.876$) and privacy and security ($r = 0.938$); consumer trust and purchase intention were also strongly associated ($r = 0.899$). Privacy and security had the lowest mean yet the strongest link with trust, so it is the most important area for improvement. The study recommends stronger data protection, clear explanation of recommendations, disclosure of AI use, user control over personalization and a human support option.

Keywords: Artificial Intelligence; AI Chatbots; Consumer Trust; Product Recommendations; E-commerce; Personalization; Transparency; Privacy and Security; Purchase Intention; Visakhapatnam.

1. INTRODUCTION

The rapid growth of artificial intelligence (AI) has changed the way businesses interact with consumers online. In e-commerce, AI-powered chatbots are used to provide customer support, answer queries, give product information and recommend products based on consumer preferences and previous interactions (Sun & Zhang, 2018).

Product recommendation is one of the major functions of AI chatbots. By analysing preferences, search behaviour and product interests, a chatbot can suggest products relevant to an individual consumer. However, the effectiveness of these recommendations depends not only on technology but also on consumer trust.

Consumer trust may be influenced by recommendation accuracy, personalization, transparency, and privacy and security. Clear communication about how recommendations are generated and how personal information is used may reduce concerns and improve trust. This study focuses on online shoppers in Visakhapatnam and examines trust towards AI chatbots during product recommendation, including the relationship between trust and purchase intention.

2. REVIEW OF LITERATURE

Trust is widely treated as a central factor in e-commerce adoption (Thaw et al., 2009), and trust in online product recommendations has been linked to consumer decision-making (Lu & Yu, 2010). Nilashi et al. (2016) studied recommendation quality and transparency as routes to trust in recommendation agents, and Zhang and Curley (2018) examined how explanations of recommendations affect consumers' trust in recommender agents.

On personalization, Xiao and Benbasat (2018) showed that biased personalized recommendations can influence consumers' decision-making outcomes, which points to the need for personalization that consumers can rely on. For chatbots specifically, Cheng and Jiang (2022) examined consumer response to text-based chatbots in e-commerce, including the roles of task complexity and chatbot disclosure, while Matsui and Yamada (2019) studied how virtual agents can be designed to be trustworthy when recommending products.

Research Gap

- **Geographical and local market gap:** Little city-level research focuses on online shoppers in Visakhapatnam, and broader findings may not represent this market.
- **Technology gap:** Earlier studies often examined traditional recommendation systems and virtual agents, with less attention to AI chatbots that give product recommendations.
- **Variable gap:** Few studies combine recommendation accuracy, personalization, transparency, privacy and security, consumer trust and purchase intention in one model.
- **Consumer behaviour gap:** There is scope to examine whether trust in chatbot recommendations is associated with purchase intention.

3. OBJECTIVES OF THE STUDY

1. To study the level of consumer trust towards AI chatbots providing product recommendations on e-commerce websites.
2. To analyse the relationship between recommendation accuracy and consumer trust towards AI chatbots.
3. To examine the relationship between personalization and consumer trust towards AI chatbots.
4. To analyse the relationship between transparency and consumer trust towards AI chatbot recommendations.
5. To examine the relationship between privacy and security and consumer trust towards AI chatbots.
6. To identify the relationship between consumer trust and purchase intention.
7. To identify the factor most strongly associated with consumer trust.
8. To suggest measures for building consumer trust in AI chatbot recommendations.

4. HYPOTHESES

Each hypothesis is linked to one objective. For every hypothesis, the null hypothesis (H0) states that there is no significant relationship, and the alternative hypothesis is stated below. Objectives 1 and 7 are descriptive and are answered through mean scores and by comparing the correlation values of H1 to H4, and Objective 8 is answered through the suggestions.

Table 1. Linkage between objectives and hypotheses

Objective	Hypothesis (alternative)	Tested using
1	Descriptive; no hypothesis	Mean score of trust
2	H1: Recommendation accuracy is positively associated with consumer trust towards AI chatbots.	Pearson correlation
3	H2: Personalization is positively associated with consumer trust towards AI chatbots.	Pearson correlation
4	H3: Transparency is positively associated with consumer trust towards AI chatbot recommendations.	Pearson correlation
5	H4: Privacy and security are positively associated with consumer trust towards AI chatbots.	Pearson correlation
6	H5: Consumer trust towards AI chatbots is positively associated with purchase intention.	Pearson correlation
7	Descriptive; compares the r values of H1 to H4	Correlation comparison
8	Not applicable; answered through suggestions	Findings

5. RESEARCH METHODOLOGY

Research Design

The study follows a quantitative, descriptive and analytical design with a cross-sectional approach. The descriptive part describes respondent

characteristics and perceptions; the analytical part examines relationships among recommendation accuracy, personalization, transparency, privacy and security, consumer trust and purchase intention.

Sample Design

The population consists of online shoppers in Visakhapatnam who have used e-commerce websites or applications. Non-probability convenience sampling was used, and the final analysis is based on 90 usable responses. Of these, 74 respondents (82.2%) had interacted with an AI chatbot while shopping online and 16 (17.8%) had not.

Data Collection

Primary data were collected through a structured questionnaire prepared in Google Forms and shared online with eligible respondents. Respondents were informed of the academic purpose, participation was voluntary and responses were kept confidential. The responses were downloaded, and incomplete or unusable responses were removed before analysis.

Questionnaire

The instrument has 30 questions in eight sections (Table 2). The attitude statements use a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Table 2. Structure of the questionnaire

Section	Area	Questions
1	Respondent Profile	Q1–Q6
2	AI Chatbot Experience	Q7–Q10
3	Recommendation Accuracy	Q11–Q14
4	Personalization	Q15–Q17
5	Transparency	Q18–Q20
6	Privacy and Security	Q21–Q23
7	Consumer Trust	Q24–Q27
8	Purchase Intention	Q28–Q30

Variables and Conceptual Model

Recommendation accuracy, personalization, transparency, and privacy and security are the independent variables; consumer trust towards AI chatbots is the dependent variable; and purchase intention is the outcome variable. The conceptual relationship is: Recommendation Accuracy, Personalization, Transparency, Privacy and Security → Consumer Trust → Purchase Intention.

Data Analysis Methods

Percentage analysis described the respondent profile, mean scores described each construct, and Pearson correlation tested H1 to H5. Because the sample is 90, any correlation above about 0.35 is significant at the 0.001 level, and all correlations reported here exceed this.

The Privacy and Security items mix concern-oriented and confidence-oriented wording, so results for this construct should be interpreted with care.

6. DATA ANALYSIS

Respondent Profile

Table 3 shows the most frequent category for each profile variable. Most respondents were young: 57 (63.3%) were aged 18–20, 30 (33.3%) were aged 21–23 and only 3 (3.3%) were 24 or above. Females formed 63.3% (57) and males 36.7% (33) of the sample (Figures 1 and 2).

Table 3. Respondent profile (most frequent category)

Profile	Category	Frequency	Percentage
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Profile	Category	Frequency	Percentage
Age	18–20	57	63.3%
Gender	Female	57	63.3%
Occupation	Self-employed	45	50.0%
Online shopping frequency	3–5 times/month	49	54.4%
E-commerce platform	Amazon	55	61.1%
Online shopping experience	3–4 years	54	60.0%
AI chatbot interaction	Yes	74	82.2%

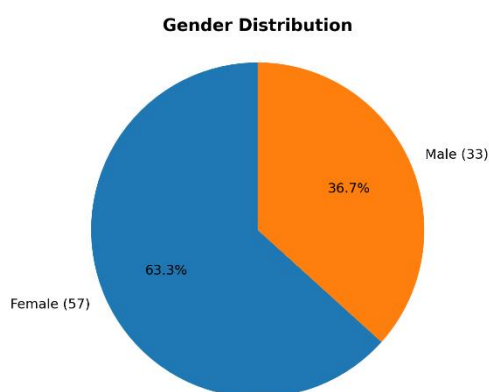


Figure 1. Gender distribution

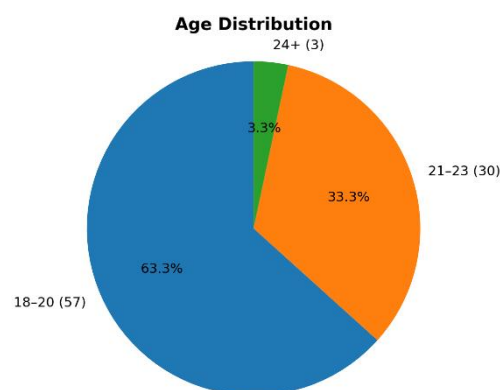


Figure 2. Age distribution

AI Chatbot Experience

A large majority of respondents, 74 (82.2%), had interacted with an AI chatbot while shopping online, against 16 (17.8%) who had not (Figure 4). Amazon was the most used platform (55 respondents, 61.1%), with the remaining 35 using other platforms (Figure 3).

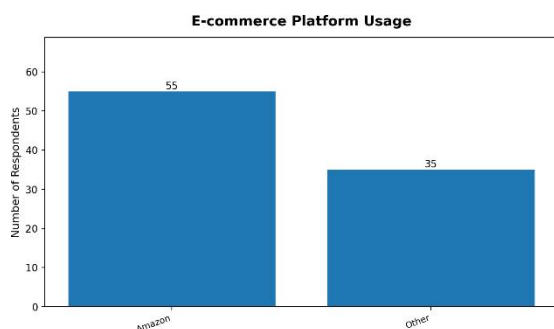


Figure 3. E-commerce platform usage

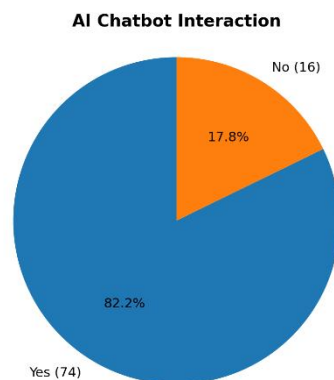


Figure 4. AI chatbot interaction

Construct-Level Analysis

For interpretation, mean scores are read as: 1.00–2.60 low, 2.61–3.40 moderate, 3.41–4.20 moderately high and 4.21–5.00 high. All constructs fall in the moderately high band (Table 4, Figure 5). Personalization recorded the highest mean (3.92), followed by purchase intention (3.86), transparency (3.77), recommendation accuracy (3.74), consumer trust (3.57), and privacy and security (3.56).

Table 4. Construct-level mean scores

Construct	Questions	Mean	Level
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Construct	Questions	Mean	Level
Recommendation Accuracy	Q11–Q14	3.74	Moderately high
Personalization	Q15–Q17	3.92	Moderately high
Transparency	Q18–Q20	3.77	Moderately high
Privacy and Security	Q21–Q23	3.56	Moderately high (lowest)
Consumer Trust	Q24–Q27	3.57	Moderately high
Purchase Intention	Q28–Q30	3.86	Moderately high

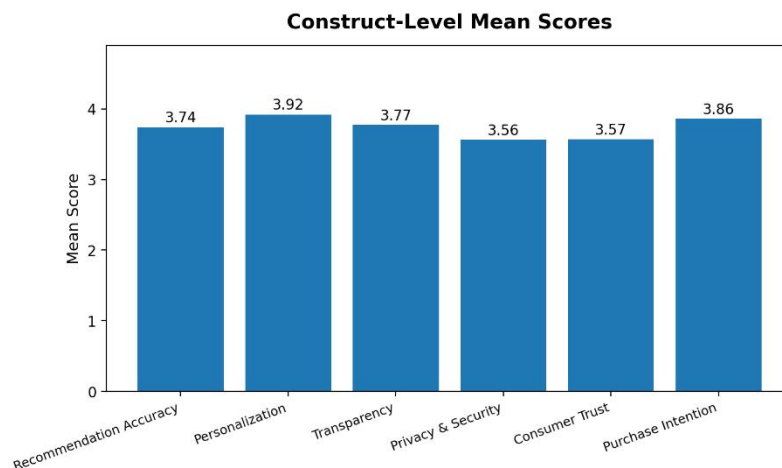


Figure 5. Construct-level mean scores

Correlation Analysis and Hypothesis Testing

Table 5 reports Pearson correlations ($n = 90$). All are positive and significant at $p < 0.001$, so H1 to H5 are supported. Correlation shows association, not causation.

Table 5. Pearson correlations and hypothesis decisions

Relationship	r	p-value	Interpretation	Hypothesis
Recommendation Accuracy ↔ Consumer Trust	0.834	< 0.001	Strong positive	H1 supported
Personalization ↔ Consumer Trust	0.859	< 0.001	Strong positive	H2 supported
Transparency ↔ Consumer Trust	0.876	< 0.001	Strong positive	H3 supported
Privacy and Security ↔ Consumer Trust	0.938	< 0.001	Very strong positive	H4 supported
Consumer Trust ↔ Purchase Intention	0.899	< 0.001	Very strong positive	H5 supported

8. FINDINGS

A total of 90 usable responses were analysed. Most respondents were young (63.3% aged 18–20 and 96.7% below 24) and 63.3% were female. A large majority, 82.2%, had interacted with an AI chatbot while shopping online.

Consumer trust towards AI chatbots had a mean of 3.57, which is moderately high. It was lower than purchase intention (3.86) and lower than every other construct except privacy and security (3.56).

Recommendation accuracy had a mean of 3.74 and a strong positive association with consumer trust ($r = 0.834$), the weakest of the four factors.

Personalization had the highest mean score (3.92) and a strong positive association with consumer trust ($r = 0.859$).

Transparency had a mean of 3.77 and a strong positive association with consumer trust ($r = 0.876$).

Privacy and security had the lowest mean score (3.56) but the strongest association with consumer trust ($r = 0.938$), so it is the factor most strongly linked with trust and the one that needs the most attention.

Consumer trust and purchase intention had a very strong positive correlation ($r = 0.899$), while trust (3.57) lagged behind intention to purchase (3.86).

All five relationships were positive, strong and significant ($p < 0.001$), so hypotheses H1 to H5 are supported.

9. SUGGESTIONS

Because privacy and security was rated lowest yet is most closely tied to consumer trust, e-commerce companies should strengthen data protection and clearly tell customers how their personal information is collected, stored and used.

Since transparency is strongly associated with trust, chatbots should explain why a particular product is recommended and should make it clear that the customer is interacting with an AI chatbot, which is consistent with the research on explanation and disclosure cited earlier.

As recommendation accuracy has a strong link with trust and a below-average rating, businesses should keep improving it so that recommended products match customers' requirements and interests.

Personalization is already rated highest, so businesses should maintain it while avoiding excessive, intrusive or biased personalization.

Customers should be given practical options to manage personalization and to control how their personal information is used, because this addresses both personalization and the concern about privacy.

A human customer-support option should remain available when chatbot answers are unclear, complex or sensitive; this is a general recommendation supported by the literature on task complexity (Cheng & Jiang, 2022) and was not tested directly in this survey.

Because trust is strongly linked with purchase intention but is rated lower than it, businesses should treat trust as a measurable goal and regularly evaluate it, together with accuracy, personalization, transparency, and privacy and security.

10. CONCLUSION

Consumer trust is an important part of AI chatbot-based product recommendation in e-commerce. Among online shoppers in Visakhapatnam, trust is moderately high (3.57) but lower than purchase intention (3.86). Recommendation accuracy, personalization, transparency, and privacy and security were all strongly and significantly associated with trust, and trust was very strongly associated with purchase intention. Privacy and security, the lowest-rated factor, had the strongest link with trust, so strengthening data protection and communicating it clearly should be the first step. Alongside this, e-commerce businesses should provide accurate recommendations, useful but non-intrusive personalization and transparent communication, and keep a human support option. Doing so is likely to raise consumer trust and, with it, purchase intention.

SCOPE FOR FUTURE RESEARCH

The study uses convenience sampling, a small sample of 90 and a single city, and the sample is mostly young, so the results cannot be generalised to all online shoppers. Correlation does not show causation, and the high correlations (0.83 to 0.94) suggest that the constructs may overlap. Reliability coefficients such as Cronbach's alpha were not reported for the constructs. The conceptual model, in which trust links the four factors to purchase intention, was not tested statistically. Future studies should use larger and more varied samples, apply multiple regression to find which factor most affects trust, test whether trust mediates the effect on purchase intention, and compare chatbot users with non-users.

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