

## Understanding Consumer Behavior towards Chatbots: An Empirical Study of Indian E-Commerce Users

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### Abstract

The rise of artificial intelligence has made chatbots a core element of customer service in Indian e-commerce. Consumer attitude toward Chatbot usage is essential to improving user experience and adoption. This research examines consumers' perspectives by introducing additional constructs (enjoyment, technicality, and perceived risk) to the Technology Acceptance Model (TAM), hence, providing an answer to current gaps found in the literature. A sequential exploratory mixed method approach was used, where a pilot study was performed with 200 Indian e-commerce users. Using Principal Component Analysis, variables clustered into eight factors: perceived usefulness, perceived ease of use, excitement, technicality, perceived ease, perceived value, attitudes towards chatbots, and intention to use. These research results provide significant original findings regarding consumers' accepted chatbots in research literature and practice. This study is a stepping-stone towards the establishment of a reliable measurement scale and the identification of future directions to make AI adoption models in digital commerce more accurate.

### Keywords:

Chatbot, Consumer Behavior, E-commerce, Artificial Intelligence, User Attitude, Chatbot Adoption

### 1. Introduction

Artificial Intelligence (AI) has evolved at such a rapid pace that it has gone from something of science fiction, as Steven Spielberg might say, to a very real part of daily life. AI has transformed the e-commerce sector through its various applications—within healthcare, fraud detection, and more. AI is much more than its popular perception of being related to robotics — its definition includes a broad range of technologies, such as machine learning, natural language processing (NLP), object detection, and adaptive learning systems (Greenberg, 2017). These solutions are changing the way companies serve customers — particularly through more personalized, fast-paced, and more interactive customer service experiences. In the digital age, simply having a presence online is not enough to attract and retain customers. AI-powered tools are now being used by leading e-commerce platforms like Amazon, Flipkart, and Myntra to establish the connection between in-store experience and online shopping experience. Chatbots, virtual try-ons, avatars, recommendation engines, and other AI-driven features are also being embraced to improve the online shopping experience and make it more personalized and fulfilling. Chatbots are among the most essential applications of AI technology currently, providing automated, real-time communication that may improve customer response times and reduce the need for human customer service representatives (Crittenden et al., 2019). By learning from previous interactions and providing accurate, data-driven responses, Artificial Intelligence (AI) powered chatbots will transform the future of customer engagement in the e-commerce domain.

While AI applications are gaining interest, we know little about how consumers in India understand and interact with chatbots in e-commerce scenarios. Thus, this study attempted to fill this gap in the literature and investigate consumer behavior toward chatbots at e-commerce platforms in India. Based on the Technology Acceptance Model (TAM), this study attempts to enrich the model by covering more constructs (i.e., technicality, excitement, perceived risks, etc.) of chatbot adoption in a developing economy. The primary objective of this study is to find and analyze crucial factors that influence the perceived value and risk of chatbot use from the consumer angle. This study offers initial results from a pilot study utilizing principal component analysis and reliability statistics through the development and empirical testing of a conceptual model. As far as we know, this is one of the early studies to establish a relationship between chatbot adoption and the TAM framework by introducing user-centric variables relevant to the Indian e-commerce environment.

## **2. Literature Review**

The Accelerated Growth of Artificial Intelligence (AI) technologies has drastically changed the customer service experience, especially in the e-commerce industry. Among these innovations, Chatbots emerged as critical tools providing real-time, automated, and interactive communication between a business and consumers (Hill et al., 2015). Indian e-commerce firms are increasingly adopting chatbots to improve service efficiency, cut operational costs, and offer seamless consumer interaction. As the chatbot ecosystem continues to evolve, understanding consumer behaviour and attitudes toward these intelligent agents is critical to inform the design, usability, and adoption of chatbots.

- **TAM and its Extensions**

The Technology Acceptance Model (TAM) is one of the popular theories proposed in 1989 by Davis (1989) to explain users' acceptance of technology based on two significant constructs namely perceived usefulness (PU) and perceived ease of use (PEOU). Over the years, more constructs like trust, enjoyment, subjective norms, and perceived risk were added to the original model in a bid to extend the original model (Venkatesh & Davis, 2000; Venkatesh et al., 2003). Many studies have used TAM in the chatbot context to examine consumer acceptance. For instance, Gnewuch et al. This study identified two critical factors that significantly influenced user satisfaction with conversational agents: Trust and perceived intelligence (M Gnewuch et al.) Recent studies, however, suggest that the traditional TAM constructs might not be good enough to reflect the role of both experiential and emotional factors in not only chatbot interaction but also high-context cultures like India (Patil et al., 2021). Factors like enjoyment, technical complexity, and perceived risk have become important predictors of both initial acceptance and continued usage intention among users (Chung et al., 2020; Xu et al., 2022).

- **Consumer Attitudes and Behavioural Intentions**

In this context, consumer attitude toward chatbots also includes cognitive and affective assessments (both positive and negative) about chatbots that are attributed to the quality of interaction, anthropomorphism, and response accuracy (Liao et al., 2019). These positive attitudes lead to higher intention to use the service, purchase, loyalty, and willingness to recommend. Despite these apparent advantages, however, possible adoption barriers still exist due to concerns related to technical failures, data privacy, and lack of human touch (Zamora, 2017). However, in the Indian context, where digital literacy and exposure to technology diverges significantly, the perception towards chatbots can differ drastically from developed markets. But for younger, tech-savvy consumers, the convenience and novelty of interacting

with chatbots may be appealing; the tone is generally informal and friendly (if a bit robotic), and most charge nothing for their services. Others perceive them as lacking personality or not credible enough. Indeed, a dearth of representative empirical work has specifically explored these nuanced behavioural dimensions in the Indian e-commerce context, indicating a significant gap in the literature.

- **Embracing New Constructs: Enjoy, Technicize and Risk**

This study extends the baseline TAM with enjoyment, technicality, and perceived risk as additional variables, thus striving to mirror the hedonic, cognitive, and emotional intricacies characteristic of chatbot usage. Enjoyment or perceptual quality of intrinsic pleasure derived from using the technology has been positively related to user engagement in previous research (Moon & Kim, 2001). On the other hand, technicality (defined as the perceived challenge to comprehend or to engage with chatbots) can inhibit their use, particularly among users exhibiting lower digital fluency (Luger & Sellen, 2016). As highlighted by Featherman and Pavlou (2003), perceived risk has an inverse effect on both user trust and technology acceptance and therefore must be considered as part of any contemporary model of TAM.

### **3. Literature Gap and Research Contribution**

The increasing acceptance of AI-based chatbots—especially in Indian e-commerce—is not backed by extensive empirical research that incorporates new relevant constructs into well-established technology adoption models. Broadly, studies have focused on the Western context or accepted digital services as per use cases without considering cross-cultural and contextual factors that may entirely alter consumer behavior with Indian consumers. This study is filling this gap in the literature by using a sequential exploratory mixed-method approach with the help of Principal Component Analysis (PCA) to confirm the dimensionality of consumer perception.

The study presents eight independent variables in the context of chatbot adoption: perceived usefulness, perceived convenience, perceived enjoyment, perceived technicality, perceived ease, perceived value, attitude towards chatbots, and intention to adopt chatbots, supporting the scale of context-specific and multidimensional aspects of interrogation. The results provide practical implications for practitioners and the framework sets the stage for future models of AI adoption in developing countries.

- **Hypothesis Development**

#### **H1: Perceived Usefulness**

**H1:** *Perceived usefulness of chatbots positively influences consumers' attitudes towards chatbot usage in Indian e-commerce.*

Rationale: As per TAM, when consumers perceive chatbots to be useful in accomplishing their shopping or service-related tasks efficiently, they are more likely to develop favourable attitudes toward using them (Davis, 1989).

#### **H2: Perceived Ease of Use**

**H2:** *Perceived ease of use of chatbots positively influences consumers' attitudes towards chatbot usage in Indian e-commerce.*

Rationale: An intuitive and user-friendly chatbot interface reduces cognitive effort, leading to greater acceptance (Venkatesh & Davis, 2000).

**H3:** *Perceived ease of use positively influences perceived usefulness of chatbots.*

Rationale: A system that is easy to use is often perceived as more useful, which aligns with the original TAM proposition.

**H4: Excitement**

**H4:** *Excitement experienced during chatbot interaction positively influences consumers' attitudes towards chatbot usage.*

Rationale: The hedonic aspect of chatbot interaction, such as novelty or gamified experience, enhances user engagement and attitude formation (Moon & Kim, 2001).

**H5: Technicality**

**H5:** *Perceived technical complexity of chatbots negatively influences consumers' attitudes towards chatbot usage.*

Rationale: When users perceive the chatbot as overly complex or difficult to interact with, it can act as a barrier to acceptance (Luger & Sellen, 2016).

**H6: Perceived Ease**

**H6:** *Perceived ease of chatbot interaction positively influences perceived usefulness.*

Rationale: This construct goes beyond system usability and encompasses smooth conversational flow, which increases the perceived value of the tool.

**H7: Perceived Value**

**H7:** *Perceived value of chatbot usage positively influences consumers' attitudes towards chatbots.*

Rationale: Consumers assess the benefits they gain (e.g., time saving, cost efficiency, 24/7 support) relative to the effort, leading to overall value perception and favourable attitude (Zeithaml, 1988).

**H8: Attitudes towards Chatbots**

**H8 :** *Positive attitudes towards chatbots positively influence consumers' intention to use chatbots in the future.*

Rationale: According to the Theory of Reasoned Action (TRA), attitude is a key predictor of behavioural intention (Ajzen & Fischbein, 1980).

**H9: Perceived Usefulness → Intention to Use**

**H9:** *Perceived usefulness positively influences consumers' intention to use chatbots.*

Rationale: If users find chatbots beneficial for completing tasks, their intention to use them is likely to increase.

**H10: Perceived Value → Intention to Use**

**H10:** *Perceived value positively influences consumers' intention to use chatbots.*

Rationale: Users tend to continue using digital solutions that they perceive as offering substantial value relative to effort and risk.

### 3. Research Methodology

**3.1 Research Design:** Using a sequential exploratory mixed-method design, the present study examines Indian consumers' behavioral responses toward chatbox usage in e-commerce platforms. This approach follows a qualitative phase to engage with the constructs and then a quantitative phase to assess the theoretical model against empirical data.

**3.2 Sampling and Data Collection:** Respondents who have ever interacted with chatbots on Indian e-commerce portals namely, Amazon, Flipkart, Myntra, etc. were selected through a non-probability purposive sampling technique. In the pilot phase of the study, structured online questionnaires were distributed through social media, email, and e-commerce communities to 200 users.

**Demographics:** **Gender:** 56% Male, 44% Female; **Age:** 18–25 (32%), 26–35 (47%), 36–50 (21%); **Occupation:** Student (22%), Professional (58%), Homemaker (8%), Others (12%)

**3.3 Instrument Development:** By incorporating these new dimensions on excitement, technicality, and perceived risk/value with established TAM constructs, a questionnaire was formed. Items were adapted from previously validated scales:

- Perceived Usefulness (PU) and Perceived Ease of use (PEOU) (Davis, 1989)
- Perceived Value (Zeithaml, 1988)
- Perceived Risk (Featherman & Pavlou, 2003)
- Excitement/Enjoyment (Moon & Kim, 2001)
- Attitudes (Ajzen & Fishbein, 1980)

The 5-point Likert scale was used (1 = Strongly Disagree to 5 = Strongly Agree) for each item.

### 3.4 Data Analysis Techniques

- Principal Component Analysis (PCA): Component detection & dimensionality reduction
- Reliability Testing (Cronbach's Alpha): Measured internal consistency for factors. And Regression Analysis
- Structural Equation Modeling (SEM): anticipated in subsequent stage to confirm causal links (not described in pilot)

## 4. Data Interpretation and Results

### 4.1 Principal Component Analysis (PCA)

The factor structure was evaluated using PCA with Varimax rotation.

- **KMO Measure** = 0.851 (indicating sampling adequacy)
- **Bartlett's Test of Sphericity** = Significant at  $p < 0.001$
- **Eight Factors** emerged with Eigenvalues  $> 1$ , cumulatively explaining **72.4%** of the total variance.

Factor	No. of Items	Cronbach's Alpha	Variance Explained
Perceived Usefulness (PU)	4	0.84	12.3%
Perceived Ease of Use (PEOU)	4	0.81	10.5%
Excitement	3	0.78	9.8%
Technicality	3	0.73	8.6%
Perceived Ease (Flow)	3	0.76	8.2%

Perceived Value	4	0.85	7.9%
Attitude Towards Chatbots	4	0.87	7.1%

#### 4.2 Correlation Analysis

As demonstrated, all constructs were positively and significantly correlated ( $p < 0.05$ ), indicating that the associations identified between constructs were theoretically substantiated in the context of the extended TAM model.

Relationship	Pearson's r	Significance
PU $\leftrightarrow$ Attitude	0.61	$P < 0.001$
PEOU $\leftrightarrow$ PU	0.57	$P < 0.001$
Value $\leftrightarrow$ Intention to Use	0.64	$p < 0.001$
Attitude $\leftrightarrow$ Intention to Use	0.69	$p < 0.001$
Excitement $\leftrightarrow$ Attitude	0.52	$p < 0.001$
Technicality $\leftrightarrow$ Attitude	-0.45	$p < 0.001$

#### 4.3 Hypothesis Testing (Regression Summary – Selected)

Preliminary regression analysis supports the following key hypotheses:

- **H1 (PU  $\rightarrow$  Attitude):**  $\beta = 0.32$ ,  $p < 0.001$
- **H2 (PEOU  $\rightarrow$  Attitude):**  $\beta = 0.28$ ,  $p < 0.01$
- **H3 (PEOU  $\rightarrow$  PU):**  $\beta = 0.39$ ,  $p < 0.001$
- **H5 (Technicality  $\rightarrow$  Attitude):**  $\beta = -0.26$ ,  $p < 0.01$
- **H8 (Attitude  $\rightarrow$  Intention):**  $\beta = 0.41$ ,  $p < 0.001$

#### 5. Discussion and Implications

The results sustain the strength of TAM in anticipating chatbot's adoption but simultaneously emphasizes on the need for context augmentation in such economies as India. New platform constructs such as excitement and technicality captured experiential and usability nuances that are difficult to account for with traditional TAM.

##### Practical Implications:

- Designing a bot that is easy and even fun to use may lead to a more positive attitude.
- Brands Need to Tackle Technical Complexity and Data Privacy Concerns Head-On
- This information can help to tailor chatbot-specific features and training towards different types of user groups.

#### 6. Findings and Suggestions

##### 6.1 Findings

The current study empirically examined consumer behavior on chatbot adoption in the Indian e-commerce context by expanding the Technology Acceptance Model (TAM) along with additional constructs such as excitement, technicality, and perceived value. Using a sequential exploratory mixed-method approach; Principal Component Analysis was performed to derive eight factors, and regression analysis was utilized to assess relationships between them. The results provide a number of critical insights:

- Validate the Core TAM Constructs

As in past studies, perceived usefulness (PU) and perceived ease of use (PEOU) had a strong impact on consumers' attitudes toward chatbots. Additionally, PEOU had a direct and meaningful positive impact on PU, thus confirming the integrity of the structural dimensions of the original TAM model about AI-enabled customer interfaces.

- Hedonic and Experiential Factors Matter

Finally, the construct excitement, which reflects users' emotional engagement and perceived novelty in interacting with chatbots, surfaced as a statistically significant predictor of positive user dispositions. This study addresses the gap by examining hedonic motivation for technology acceptance, especially in highly interactive and service-oriented domains like e-commerce.

- The Perceived Technicality as a Barrier to Use

The technical complexity, which refers to the perceived level of difficulty to learn, understanding, and operating the chatbot systems negatively influenced user attitudes. It implies that too much system complexity might be an auster(it)y, discouraging chatbot adoption, especially in the less tech-savvy users.

- Impressions of Value and Risk Elements

Perceived value, including convenience, time-saving, and usefulness, was also an important positive predictor of attitude toward chatbot usage and intention to use. Although perceived risk did not emerge as a distinct dimension in the PCA, qualitative responses highlighted lingering issues with data privacy, response accuracy, and human empathy that signify users' ambivalence about blindly accepting fully automated customer service.

- Attitude as a Mediating Variable

The results also validated attitude as a strong mediating construct, acting between the independent variables (PU, PEOU work excitement, technicality, perceived value), and behavioral intention. This reinforces the inclusion of TRA in the extended TAM model and illuminates that consumer decisions are grounded in cognitive and affective evaluations.

- Indian E-commerce and the Dynamics of Contextual Sensitivity

The study also yielded context-specific insights: user responses were influenced by India's socio-cultural heterogeneity, varying levels of digital literacy, and regional language preferences. These aspects combined lead to distinct usage behavior, necessitating localization of chatbot design and deployment strategies for successful implementation in India.

## 6.2 Suggestions

The following recommendations are made in light of the empirical findings of the study:

### A. Practical Recommendations for E-commerce Practitioners

- User Interface Design Simplification

The implication for e-commerce platforms would be to develop intuitive and user-friendly chatbot interfaces in order to diminish perceived technical complexity, improving rates of adoption across a broader demographic.

- Inclusion of Hedonic Characteristics

Cosmetics of the system (chatbot systems must have them) — For example, personalization, gamification, conversation flow, etc. can introduce exciting elements into chatbot applications, increase user satisfaction and produce positive attitude responses to products.

- Improving Value Proposition

It is important that the companies should explain to the users the realization of how chatbots will benefit them such as enhancing service by speeding things up, continuing with their work and faster service and 24/7 open hours which will create a second nature of a chatbot for the users so that this realization will reinforce the users' perceptions of value and create a behavioral intention.

- Reducing Risk Perceptions

Next, consumer concerns over data privacy and how reliably AI will respond must be addressed by implementing transparent data practices, AI accountability mechanisms, and the ability to easily escalate conversations with human agents if necessary.

- Consumer on boarding and education

Simple tutorials, multi-language support, and guides on how to interact with a chatbot can potentially bridge some of these gaps in digital literacy and lead to higher levels of chatbot adoption.

## **B. Theoretical Implications and Directions for Future Research**

- Contextual Constructs ~ Extension of TAM

Future research needs to investigate further constructs such as anthropomorphism, empathy, and trustworthiness, to portray the multifaceted nature of chatbot interactions in culturally nuanced markets.

- Longitudinal and Behavioral Research Designs

The current cross-sectional analysis could be extended into longitudinal studies, investigating the changes in consumer perceptions and intention to behave over time once users become more acquainted with the chatbot technologies.

- Comparisons Across Demographics and Sectors

Deeper insights into consumer segmentation and targeted chatbot deployment strategies can be derived from comparative studies across various age groups, regions, and e-commerce sectors (e.g., fashion, electronics, groceries).

- Big Data integration and sentiment analysis

In this regard, future studies can use real-time interaction data and sentiment analysis techniques to extract behavioral patterns to refine predictive models on chatbot usage.

## **7. Conclusion**

The objective of this study was to extend the Technology Acceptance Model (TAM) to gain insights into consumer behavior in adopting chatbots from the consumers of the Indian e-commerce sector. To this end, the present study integrates constructs reflecting excitement, technicality, and perceived value, enabling a richer and culturally sensitive exploration of user acceptance of two AI-driven conversational agents. The results of the pilot study confirm that traditional TAM dimensions—perceived usefulness and perceived ease of use—are still robust but highlight the importance of emotional and experiential ones in constructing consumer attitudes and intentions.

Principal Component Analysis revealed eight factors underlying user attitude: perceived usefulness, perceived ease of use, excitement, technicality, perceived ease, perceived value, attitude towards chatbots, and intention to use, highlighting the multi-dimensional characteristics involved in interaction with chatbots. Notably, perceived technicality had a negative impact on user attitudes, indicating that usability is still a considerable adoption hurdle. On the other way, excitement and perceived value positively impacted user engagement and behavioral intent, which underlined the importance of hedonic and utilitarian motivations in the domain of digital services.

This study advances knowledge both theoretically and practically. In theory, it provides a certain richness to TAM, as we are providing an alternative framework that more effectively explains consumer behavior when touched by the rapid digitization of permaculture such as



India ('@) On a practical level, it gives e-commerce businesses tangible insights into design and implementation strategies for chatbots. By simplifying tech interfaces, focusing on personalized and delightful experiences, and building privacy-first systems, we can help the world trust and adopt these technologies more effectively.

While the model proposed in this study provides significant implications and of course requires validation through large-scale SEM, future work should also focus on longitudinal studies to discover how users' perceptions change over time. Finally, measuring demographic and psychographic moderators would help provide more comprehensive user segmentation and tailored technology designs.

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