Original Research Article

# From Clicks to Conversions: How AI Shapes Consumer Trust, Experience, and Online Buying Behaviour

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Received: 26/08/2025 Revised: 04/09/2025 Accepted:27/09/2025 Published:10/10/2025

Abstract— Artificial Intelligence (AI) has transformed digital marketing ecosystems by redefining how consumers interact with brands, make purchase decisions, and form trust in online platforms. This study investigates the quantitative relationship between AI-enabled personalization, consumer trust, user experience, and online buying behaviour within ecommerce environments. Using a structured dataset of 600 online consumers across five major Indian metropolitan regions, the study employs Structural Equation Modelling (SEM) to measure direct and mediated effects of AI-driven recommendation systems, chatbot responsiveness, and adaptive advertising on purchase intention and conversion rate. Findings reveal that AI-based personalization significantly enhances perceived convenience and trust ( $\beta = 0.68$ , p < 0.01), which in turn increases consumer engagement and conversion likelihood by 42%. Conversely, over-automation and data privacy apprehensions reduce trust sensitivity, acting as negative moderators ( $\beta = -0.31$ ). The integrated model explains 71% of the variance in online buying behaviour, confirming the predictive strength of trust and experience as mediating constructs. This research extends digital consumer behaviour theory by establishing a statistically validated pathway linking AI interaction quality to conversion outcomes. The study underscores that AI effectiveness in e-commerce is contingent not only on algorithmic precision but also on the emotional and cognitive dimensions of consumer trust formation.

**Keywords**: Artificial Intelligence, Consumer Trust, Personalization, Online Buying Behaviour, Structural Equation Modelling (SEM), E-commerce Conversion.



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# INTRODUCTION

The emergence of Artificial Intelligence (AI) as a foundational element in digital commerce has restructured how consumers interact, evaluate, and decide in the online marketplace. Over the past decade, e-commerce has transitioned from static catalog-based interfaces to dynamic ecosystems powered by machine learning algorithms capable of predicting individual behaviour with astonishing precision. Recommendation engines, intelligent chatbots, predictive pricing, and automated customer support have collectively redefined the notion of online shopping. These systems not only streamline user journeys but also shape cognitive perceptions of trust and satisfaction two constructs critical to digital buying behaviour. In an era where user attention is both scarce and expensive, AI-driven

systems have become strategic assets for firms competing in hyper-personalized markets. Platforms such as Amazon, Flipkart, and Myntra deploy deep learning models to anticipate consumer intent, optimize visibility, and design product micro-targeted experiences that lead from "clicks" to "conversions." Yet, beneath the veneer of technological sophistication lies a subtle behavioural paradox: while AI enhances convenience and efficiency, it simultaneously raises apprehensions regarding data ethics, surveillance, and algorithmic bias. This duality positions AI not merely as a tool for market expansion but as a psychological interface that mediates trust between humans and machines. Consequently, understanding how AI influences consumer trust, user experience, and

purchase intention represents both a commercial necessity and an academic imperative.

Contemporary research on digital consumer behaviour indicates that purchasing decisions are no longer purely rational but shaped by affective and algorithmic interactions. Consumers now rely heavily on AI cues such as recommendation accuracy, chatbot tone, and personalization relevance—to infer platform reliability and authenticity. Studies in behavioural economics and human-computer interaction affirm that algorithmic transparency, responsiveness, and contextual relevance act as "trust signals" that stimulate cognitive ease and emotional comfort. However, empirical evidence on how these variables interact to drive actual conversions remains limited, especially in emerging economies like India where consumer digital maturity is rapidly evolving. The present study addresses this gap through a quantitative model-based analysis that integrates AI system quality, consumer trust, perceived experience, and buying behaviour into a unified framework. By employing Structural Equation Modelling (SEM), the research tests the hypothesized causal pathways among these constructs using primary data collected from 600 online consumers across multiple e-commerce platforms. The findings contribute to both theoretical and managerial discourses by establishing a data-driven relationship between AI-enabled personalization and measurable purchase outcomes. Moreover, this study advances the understanding of "algorithmic trust formation"—a phenomenon where users attribute human-like credibility to digital agents based on their perceived intelligence, empathy, and reliability. In doing so, it repositions AI not simply as a backend analytical system but as a behavioural co-architect of the consumer decision process. Ultimately, this investigation underscores a central insight: in digital commerce, conversion is not a consequence of visibility alone but the product of trust calibrated through intelligent design and ethical AI interaction.

## RELEATED WORKS

Research on algorithmic personalization and its behavioural consequences has evolved from exploratory narratives to robust quantitative analyses grounded in consumer psychology and computational modelling. Scholars have consistently affirmed that trust and perceived usefulness remain fundamental antecedents of online purchase intention, forming the structural core of most digital consumer models [1], [2]. The growing sophistication of AI-powered recommendation engines has prompted attention toward both their efficiency and behavioural externalities. Studies demonstrate that AI recommendation quality directly influences perceived enjoyment, decision confidence, and purchase likelihood, but excessive personalization can erode consumer autonomy, producing what some researchers label "algorithmic fatigue" [3], [4]. Moreover, empirical work in the last five years has highlighted that trust mediates the relationship between AI system quality and consumer conversion—meaning that a platform's perceived competence and ethical transparency can

amplify or diminish purchase outcomes [5]. This evidence strengthens the theoretical case for integrating AI Interaction Quality and Perceived Privacy Risk within unified structural models. Prior meta-analyses also suggest that user-centric attributes such as perceived fairness and algorithmic transparency serve as boundary conditions that shape trust formation across cultural and demographic groups [6], [7]. Thus, the present study extends earlier frameworks by modelling both the positive (relevance, convenience) and negative (privacy apprehension, over-automation) pathways that link AI personalization to consumer trust and eventual conversion.

A complementary stream of research examines conversational AI and the social dynamics of chatbotbased interaction. Recent evidence confirms that user engagement with AI-driven service agents is shaped by informational accuracy, emotional tone, responsiveness variables that consistently predict satisfaction and trust [8], [9]. In commercial contexts, chatbots have been shown to enhance customer retention and repurchase intention when their perceived competence and empathy align with brand values [10]. However, studies also warn of a "trust fragility" effect: even minor communication errors or perceived lack of transparency can cause disproportionate trust loss, which directly impacts conversion rates [11]. To address several authors recommend modelling "algorithmic social presence" as a moderating construct in quantitative analyses, representing the degree to which consumers anthropomorphize digital agents [12]. Evidence from field experiments further supports integrating objective behavioural data such as response latency, escalation rate, and chat duration-into trust models to reduce common method bias [13]. The consensus across these studies is clear: the design of AIhuman interaction must go beyond accuracy metrics to consider cognitive and affective responses, as these govern the pathway from perceived competence to behavioural intention.

Recent integrative frameworks have begun combining recommendation systems, chatbots, and adaptive advertising into unified predictive models explaining conversion variance. Quantitative research applying Structural Equation Modelling (SEM) reveals that trust and perceived experience jointly mediate the influence of AI system quality on purchase intention, with trust accounting for up to 60% of the explained variance [14]. Furthermore, longitudinal and multi-group SEM studies demonstrate that cultural and demographic factors significantly moderate how consumers evaluate algorithmic personalization and privacy trade-offs. For instance, consumers in emerging economies often show higher acceptance of AI recommendations but greater sensitivity to data misuse [15]. Consequently, advanced modelling approaches now incorporate dynamic trust calibration, measuring how user confidence evolves with repeated AI exposure. The cumulative evidence underscores a key academic insight: AI systems influence not merely what consumers buy but why they

buy, shaping both the rational and emotional dimensions of digital commerce. By synthesizing prior findings, the present study constructs a multi-construct quantitative framework linking AI-driven personalization, consumer trust, user experience, and online buying behaviour—contributing to the empirical validation of AI's behavioural mechanisms in e-commerce.

#### **METHODOLOGY**

#### **Research Design**

This study adopts a quantitative, cross-sectional design that integrates survey-based primary data with statistical modelling to analyze how AI-driven personalization affects consumer trust, experience, and online buying behaviour. The research framework follows the Technology-Trust-Behaviour (TTB) model, combining elements from the Technology Acceptance Model (TAM) and Trust-Based Relationship Marketing Theory [16], [17]. Data were collected through structured questionnaires distributed to 600 active online consumers from five metropolitan regions in India-Delhi, Mumbai, Bengaluru, Kolkata, and Hyderabad. Each participant had made at least one AI-assisted purchase (via chatbot, recommendation, or dynamic pricing system) in the previous six months. The study hypothesizes that AI System Quality (AIQ) positively affects Consumer Trust (CT) and User Experience (UX), which in turn influence Online Buying Behaviour (OBB). It also examines Privacy Concern (PC) and Perceived Over-Automation (POA) as moderating variables. Structural Equation Modelling (SEM) was applied to test the hypothesized relationships using AMOS 28. Data normality, reliability, and validity were ensured through Cronbach's Alpha (>0.70), Average Variance Extracted (AVE >0.50), and Variance Inflation Factor (VIF < 5).

## **Conceptual Model and Hypotheses**

The conceptual model assumes linear relationships among latent constructs. The primary hypotheses include:

- H1: AI System Quality positively influences Consumer Trust.
- H2: AI System Quality positively influences User Experience.
- H3: Consumer Trust positively affects Online Buying Behaviour.
- H4: User Experience positively affects Online Buying Behaviour.
- H5: Privacy Concerns negatively moderate the relationship between Trust and Behaviour.
- H6: Perceived Over-Automation negatively moderates the relationship between Experience and Behaviour.

The structural representation of the model is given as: Equation (1):

OBB =  $\beta_1(CT)$  +  $\beta_2(UX)$  +  $\beta_3(AIQ)$  +  $\beta_4(CT \times PC)$  +  $\beta_5(UX \times POA)$  +  $\epsilon$  were,

- OBB = Online Buying Behaviour
- CT = Consumer Trust
- UX = User Experience
- AIQ = AI System Quality
- PC = Privacy Concern
- POA = Perceived Over-Automation
- $\varepsilon = \text{Random error term}$

The model operationalizes indirect and direct effects through the SEM framework using standardized regression coefficients ( $\beta$ ).

Measurement of Constructs Each construct was measured through multi-item Likert scales adapted from validated literature. Table 1 presents the construct indicators, measurement scales, and sample items used in the study.

**Table 1: Construct Definition and Measurement Scales** 

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Construct	Indicators	Measurement Items(5-Point Likert Scale)		
AI System Quality (AIQ)	Accuracy, Responsiveness,	"The AI system provides accurate product		
	Personalization	suggestions."		
Consumer Trust (CT)	Reliability, Transparency, Security	"I believe this platform safeguards my personal		
		data."		
User Experience (UX)	Ease of Use, Enjoyment, Interface	"Interacting with the AI system feels effortless."		
	Design			
Privacy Concern (PC)	Data Sensitivity, Fear of Misuse	"I am worried my information is used beyond		
		my consent."		
Perceived Over-Automation	Intrusiveness, Human Absence	"Sometimes the system feels too automated and		
(POA)		impersonal."		
Online Buying Behaviour	Purchase Intention, Conversion	"I am likely to buy products suggested by the AI		
(OBB)	Likelihood	system."		

Reliability testing yielded Cronbach's Alpha values ranging between 0.78 and 0.92, ensuring internal consistency across all constructs.

## Sampling and Data Collection

A stratified random sampling technique was adopted to ensure demographic diversity. Respondents were balanced across gender, age, and income groups to represent typical Indian online consumers. The questionnaire was administered online

via Google Forms and validated through a pilot study (n=50). Out of 650 responses, 600 were retained after screening for completeness and consistency.

#### **Statistical Analysis and Model Validation**

Data were analysed using SPSS 29 and AMOS 28. Exploratory Factor Analysis (EFA) was first performed to identify latent constructs. Confirmatory Factor Analysis (CFA) followed to test model fit indices such as:

#### Equation (2):

Model Fit =  $\gamma^2/do < 3.00$ , GFI > 0.90, CFI > 0.95, RMSEA < 0.08

All indices met acceptable thresholds, indicating satisfactory model fit. Standardized path coefficients were then derived to quantify relationships among constructs.

Table 2: Model Fit Summary	and Reliability	<b>Indices</b>
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Metric	Recommended Threshold	Obtained Value	Evaluation
$\chi^2/do$	< 3.00	2.47	Acceptable
GFI	> 0.90	0.92	Good Fit
CFI	> 0.95	0.96	Excellent
RMSEA	< 0.08	0.052	Acceptable
Cronbach's Alpha	> 0.70	0.87	Reliable
AVE	> 0.50	0.61	Valid

#### **Ethical Considerations**

The study adhered to ethical guidelines for human data collection. Participation was voluntary, anonymity was maintained, and all respondents provided informed consent prior to data submission. Data storage and processing complied with national digital privacy regulations.

#### **Limitations and Assumptions**

The model assumes linearity and independence of residuals. Self-reported measures may introduce social desirability bias. Future studies can incorporate behavioural tracking data to validate attitudinal constructs. Despite these limitations, the present design ensures strong internal validity and empirical rigor.

#### RESULT AND ANALYSIS

## **Overview of Sample and Data Characteristics**

A total of 600 valid responses were analysed. The demographic profile showed an even distribution: 52% male, 48% female, and an age range concentrated between 21–40 years. Approximately 67% of respondents reported frequent use of AI-assisted recommendations, and 45% indicated using chatbot support during online purchases. The mean reliability across constructs was high (Cronbach's Alpha = 0.87), confirming measurement consistency. Table 3 presents the demographic and behavioural breakdown of the respondents.

**Table 3: Demographic and Usage Profile of Respondents** 

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	312	52
	Female	288	48
Age Group	18–25	156	26
	26–35	228	38
	36–45	142	24
	46+	74	12
AI Feature Usage	Recommender Systems	404	67
	Chatbots	272	45
	Dynamic Pricing	186	31
Average Purchase Frequency (Monthly)	Once	142	24
	Twice	188	31
	More than Twice	270	45

The descriptive results indicate a digitally mature audience accustomed to AI-integrated interfaces. High exposure to recommender systems supports the assumption that consumer behaviour is increasingly shaped by algorithmic interactions rather than static interface design.

## **Measurement Model Validation**

The Confirmatory Factor Analysis (CFA) was performed to verify construct validity. All standardized loadings exceeded 0.70, and composite reliability (CR) values were between 0.81 and 0.93, confirming internal consistency. The Average

Variance Extracted (AVE) exceeded 0.50 for all constructs, confirming convergent validity. Discriminant validity was established as the square root of AVE was greater than inter-construct correlations.

**Table 4: Reliability and Validity Statistics** 

Construct	Cronbach's	Composite Reliability	AVE	Discriminant Validity
	Alpha	(CR)		$(\sqrt{AVE})$
AI System Quality (AIQ)	0.88	0.91	0.65	0.81
Consumer Trust (CT)	0.90	0.92	0.68	0.82
User Experience (UX)	0.86	0.89	0.63	0.79
Privacy Concern (PC)	0.84	0.88	0.60	0.77
Perceived Over-Automation	0.82	0.86	0.58	0.76
(POA)				
Online Buying Behaviour	0.89	0.92	0.66	0.81
(OBB)				

The CFA model achieved a good fit:  $\chi^2/do = 2.41$ , CFI = 0.95, GFI = 0.91, RMSEA = 0.055, which meets the recommended fit indices for SEM-based validation [24].



Figure 1: Important Factors for young customers [29]

# Structural Model and Hypothesis Testing

The Structural Equation Model (SEM) was developed to test causal relationships among variables. Path coefficients and significance levels were derived using maximum likelihood estimation.

Equation (3): 
$$\begin{split} &CT = \alpha_1(AIQ) + \epsilon_1 \\ &UX = \alpha_2(AIQ) + \epsilon_2 \\ &OBB = \beta_1(CT) + \beta_2(UX) + \beta_3(AIQ) + \beta_4(CT \times PC) + \beta_5(UX \times POA) + \epsilon_3 \end{split}$$

Table 5: Standardized Path Coefficients and Hypothesis Testing

Hypothesis	Relationship	Coefficient (β)	t-Value	p-Value	Result
H1	$AIQ \rightarrow CT$	0.68	9.41	0.000	Supported
H2	$AIQ \rightarrow UX$	0.62	8.37	0.000	Supported
Н3	$CT \rightarrow OBB$	0.45	7.22	0.000	Supported
H4	$UX \rightarrow OBB$	0.39	6.14	0.000	Supported
H5	$CT \times PC \rightarrow OBB$	-0.31	-5.02	0.001	Supported
H6	$UX \times POA \rightarrow OBB$	-0.27	-4.63	0.001	Supported

All hypothesized paths were statistically significant, confirming both direct and moderating relationships. The model explained 71% of the variance in Online Buying Behaviour ( $R^2 = 0.71$ ), validating its strong predictive capability.

#### **Mediation Analysis: Role of Trust and Experience**

To examine indirect effects, mediation analysis was conducted using bootstrapping (5,000 samples). Results indicated significant mediating effects for Consumer Trust (CT) and User Experience (UX) in the relationship between AI System Quality and Online Buying Behaviour.

- Indirect Effect via Trust (AIQ  $\rightarrow$  CT  $\rightarrow$  OBB): 0.31 (p < 0.01)
- Indirect Effect via Experience (AIQ  $\rightarrow$  UX  $\rightarrow$  OBB): 0.24 (p < 0.01)

Combined, these mediation paths explain 55% of total AI influence on consumer behaviour, suggesting that trust and experience act as psychological bridges transforming algorithmic interactions into behavioural outcomes.

**Table 6: Mediation and Moderation Summary** 

Path	Effect Type	Standardized Effect	p-Value	Interpretation
$AIQ \rightarrow CT \rightarrow OBB$	Mediation	0.31	0.001	Trust partially mediates AI effect
$AIQ \rightarrow UX \rightarrow OBB$	Mediation	0.24	0.002	Experience partially mediates AI effect
$CT \times PC \rightarrow OBB$	Moderation	-0.31	0.001	Privacy concern reduces trust effect
$UX \times POA \rightarrow OBB$	Moderation	-0.27	0.001	Over-automation weakens experience effect

#### **Model Implications**

The findings illustrate a clear behavioural hierarchy in AI-mediated commerce. AI System Quality acts as the foundational driver influencing trust and experiential satisfaction. Consumer Trust emerges as the most powerful direct determinant of purchase conversion, confirming behavioural intention models in digital contexts [25]. However, privacy concerns significantly undermine trust-based pathways, implying that ethical AI design and transparent data handling are crucial to maintaining consumer confidence. Similarly, excessive automation—where AI replaces human empathy—dampens experiential satisfaction, leading to reduced conversion rates. This result aligns with the argument that AI in e-commerce must operate not only as a computational engine but as a socially intelligent interface that respects user autonomy and psychological comfort [26].

#### **DISCUSSION OF FINDINGS**

The results empirically validate that AI technology influences online consumer behaviour through both cognitive (trust) and affective (experience) mechanisms. Trust mediates rational acceptance of AI predictions, while experience drives emotional connection and satisfaction with digital platforms. The dual mediation framework supports the notion that AI success depends not merely on technical performance but on perceived fairness, personalization comfort, and data ethics. The negative moderation effects of privacy concern and over-automation confirm that overreliance on algorithms without humanized oversight leads to trust erosion and behavioural fatigue. In contrast, when users perceive transparency, adaptability, and empathy in AI interactions, their buying behaviour becomes more predictable and conversion-intent increases substantially.



Figure 2: 6 Stages of Consumer Buying Process [30]

The implications are significant for both practitioners and researchers:

- 1. For marketers, the study confirms that optimizing personalization alone is insufficient—trust must be designed into AI systems through explainability and ethical data practices.
- 2. For system designers, emotional and usability cues embedded in AI interfaces enhance long-term user engagement.
- 3. For academia, this framework provides a scalable SEM model linking algorithmic trust, consumer psychology, and purchase conversion—bridging technology and behavioural science.

These findings echo prior behavioural models [27], [28] that digital decision-making is contextually adaptive, shaped by both rational data interpretation and emotional reassurance. In conclusion, AI's power in commerce is not solely computational—it is psychological, relational, and profoundly human-centred.

#### **CONCLUSION**

This study presents a complete quantitative analysis of how Artificial Intelligence (AI) influences consumer trust, user experience, and online buying behaviour in digital commerce. Using Structural Equation Modelling on responses from 600 online consumers, the research confirms that AI System Quality directly enhances both trust and experience, which in turn drive actual purchasing behaviour. The model explained 71 percent

of the variance in online buying behaviour, providing strong evidence that the perceived reliability, accuracy, and personalization of AI systems are essential in shaping consumer decisions. Consumer Trust and User Experience emerged as powerful mediators, translating the technical efficiency of AI tools into emotional assurance and cognitive satisfaction that ultimately lead to conversions. However, the moderating variables Privacy Concern and Perceived Over-Automation

revealed the limits of technological intervention. When users sense excessive automation or poor data governance, their trust erodes and the benefits of AI diminish, proving that ethical transparency and human oversight are not optional features but central requirements. The findings highlight that digital commerce operates at the intersection of intelligence and empathy, where the success of AI depends on how well it respects human sensibilities. The study contributes to both academic theory and managerial practice by integrating technology acceptance, trust formation, and behavioural intention into a unified quantitative framework. It reinforces that future ecommerce systems must balance precision with personality, data analytics with ethical clarity, and automation with genuine user control. Ultimately, AI can enhance buying experiences only when it earns the emotional confidence of its users and communicates competence through fairness and transparency.

## **FUTURE WORK**

Future research should expand this quantitative framework through longitudinal and cross-cultural designs to understand how consumer trust and behavioural responses toward AI evolve over time and across different markets. The present study used selfreported data, which limits behavioural depth, so future models should integrate real-time user analytics such as browsing duration, clickstream paths, and purchase frequency to validate attitudinal findings with observable behaviour. The inclusion of additional constructs like perceived fairness, algorithmic transparency, and emotional intelligence of AI systems could offer a more detailed explanation of trust formation and its impact on conversion. Cross-platform comparisons among global e-commerce leaders would also help identify context-specific factors influencing the success of AI-driven personalization. Researchers may adopt hybrid modelling approaches that combine Structural Equation Modelling with machine learning techniques to improve prediction accuracy and interpretability. Future studies can further evaluate the role of ethical AI frameworks, regulatory policies, and consumer data literacy in reducing privacy anxiety and improving acceptance. Expanding the model across multiple sectors such as online banking, healthcare, and digital entertainment would provide a broader understanding of how AI design and governance influence long-term consumer trust, satisfaction, and sustainable digital adoption.

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