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# Role of AI Algorithms in Shaping Consumer Attitudes toward Targeted Advertising on Social Media

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**ABSTRACT:** The rapid proliferation of Artificial Intelligence (AI) in digital marketing has transformed how social media platforms deliver personalized advertising. This study examines how AI-driven algorithms shape consumer attitudes toward targeted advertising by investigating the joint influence of perceived personalization, perceived usefulness, and privacy concerns, while treating trust in AI as a mediating variable and algorithm awareness as a moderating factor. Primary data were collected from 114 active social media users in India through a structured five-point Likert-scale questionnaire and analysed using descriptive statistics and percentage-based interpretation. Findings reveal that the majority of respondents perceive targeted advertisements as relevant and useful (personalization agreement: ~65.8%; usefulness in product discovery: ~72.8%), yet simultaneously report strong privacy apprehension (~74.6% concern). Trust in platform AI is moderate (~62.3% agreement), and overall consumer attitude is cautiously positive (~62.2%). The coexistence of perceived benefit and perceived risk reflects a classic privacy-calculus trade-off. The study concludes that algorithmic personalization significantly enhances advertising acceptance, but effectiveness remains contingent on transparent data practices and robust platform trust. Managerial and theoretical implications for responsible AI deployment in digital marketing are discussed.

**KEYWORDS:** Artificial Intelligence, targeted advertising, consumer attitude, personalization, privacy calculus, social media, trust, algorithm awareness

## I. INTRODUCTION

The digital advertising ecosystem has undergone a paradigm shift with the integration of Artificial Intelligence (AI) into social media platforms such as Instagram, Facebook, and YouTube. Unlike traditional mass-media campaigns, AI-driven advertising leverages machine-learning algorithms to analyse behavioural data—browsing history, purchase patterns, demographic attributes, and interaction logs—in order to serve hyper-personalised content to individual users (Davenport & Ronanki, 2018). This shift from mass marketing to precision marketing has dramatically improved advertiser efficiency, yet it simultaneously raises fundamental questions about consumer autonomy, data governance, and digital trust.

Consumer response to algorithm-curated advertising is complex. On one hand, personalisation reduces information overload and surfaces relevant products, potentially enhancing the user experience (Bleier & Eisenbeiss, 2015). On the other, continuous behavioural tracking creates perceptions of surveillance and data misuse, engendering scepticism and resistance (Baek & Morimoto, 2012). The net attitude outcome therefore depends on how individuals cognitively weigh these competing forces—a dynamic captured theoretically by the Privacy Calculus framework (Culnan & Armstrong, 1999).

Despite a growing body of literature on each of these dimensions in isolation, integrated empirical studies that simultaneously model personalization benefits, privacy risk, trust mediation, and algorithmic awareness—particularly in the context of an emerging economy such as India—remain scarce. This paper addresses that gap by presenting



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findings from a primary survey of Indian social media users and situating the results within an integrated conceptual framework grounded in the Technology Acceptance Model (TAM), Privacy Calculus Theory, and Trust Theory.

### II. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

#### 2.1 Technology Acceptance and Perceived Usefulness

Davis (1989) established that perceived usefulness is the dominant predictor of technology acceptance. Venkatesh and Davis (2000) later confirmed this across longitudinal field studies, demonstrating that utility beliefs remain stable over time and context. In advertising research, Taylor, Lewin, and Strutton (2011) found that perceived usefulness and informativeness significantly predict positive social-network ad attitudes, while Boateng and Okoe (2015) confirmed that credibility and usefulness jointly drive targeted-ad acceptance.

#### 2.2 Personalization and the Personalization Paradox

Bleier and Eisenbeiss (2015) demonstrated that personalized ads improve click-through rates when they align with browsing context; however, Lambrecht and Tucker (2013) cautioned that high specificity can trigger perceptions of intrusiveness. Awad and Krishnan (2006) formalized the tension as the "personalization-privacy paradox": consumers value tailored content yet retain significant privacy concerns, engaging in cost-benefit evaluation before accepting personalized services. Arora et al. (2008) added that perceived control moderates this trade-off, with greater user agency reducing negative reactions.

#### 2.3 Privacy Concerns

Malhotra, Kim, and Agarwal (2004) developed the IUIPC scale establishing that privacy concerns—comprising awareness, collection unease, and control—directly suppress trust and online behavioural intentions. Goldfarb and Tucker (2011) confirmed that privacy sensitivity weakens the conversion effectiveness of behavioural targeting. In AI-driven contexts, the opacity of algorithmic profiling intensifies such concerns, as consumers perceive a power asymmetry between themselves and the platform.

#### 2.4 Trust in AI Systems

Gefen, Karahanna, and Straub (2003) demonstrated that trust reduces perceived risk and bolsters usefulness perceptions in online contexts. Glikson and Woolley (2020) reviewed empirical evidence showing that AI trust is grounded in perceived competence, reliability, and fairness. Shin (2020) specifically found that algorithmic transparency and accountability are pivotal: when users understand the decision logic behind AI recommendations, acceptance increases substantially. Kizilcec (2016) reinforced this, showing that even minimal explanations of algorithmic functioning significantly boost perceived fairness.

#### 2.5 Algorithm Awareness

Gran, Booth, and Bucher (2021) identified algorithm awareness as an emerging digital-literacy construct that moderates content evaluation: high-awareness users are simultaneously more critical and more receptive to transparent algorithmic systems. Bucher (2017) conceptualized user mental models of algorithms as "algorithmic imaginaries" that shape emotional and evaluative responses to algorithmically curated content, underscoring the need to treat awareness as a theoretically distinct variable.

### III. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Drawing on TAM (Davis, 1989), Privacy Calculus Theory (Culnan & Armstrong, 1999), and Trust Theory (Gefen et al., 2003), this study proposes a model in which three antecedents—Perceived Personalization (PP), Perceived Usefulness (PU), and Privacy Concerns (PC)—influence Consumer Attitude toward Targeted Advertising (CATA), partially mediated by Trust in AI Algorithms (TAIA) and moderated by Algorithm Awareness (AA). The following hypotheses are posited:

- H1: PP has a significant positive effect on CATA.
- H2: PU has a significant positive effect on CATA.
- H3: PC has a significant negative effect on CATA.
- H4: PP positively influences TAIA.
- H5: PU positively influences TAIA.
- H6: PC negatively influences TAIA.



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H7: TAIA positively influences CATA.

H8: AA moderates the relationships between PP/PU/PC and CATA.

### IV. RESEARCH METHODOLOGY

#### 4.1 Research Design

A quantitative, cross-sectional survey design was adopted. The deductive approach was employed, testing hypotheses derived from established theoretical frameworks using primary data. The study is contextualised within India, a rapidly digitalising emerging economy where AI-based advertising is proliferating amid evolving consumer awareness and limited regulatory maturity—a context that offers generalisable insights for other developing markets.

#### 4.2 Sampling and Data Collection

The target population comprised active social media users aged 18–45 with prior exposure to personalised advertising. Purposive and convenience sampling were combined; a screening question at the questionnaire outset confirmed eligibility. Data were collected via a structured Google Forms questionnaire distributed through social media channels and snowball referral. A total of 114 valid responses were retained after removing incomplete submissions. The sample skews young (18–24: 64.9%; 25–34: 31.6%), consistent with the dominant demographic on social media platforms, and predominantly comprises students (59.6%) and employed individuals (28.9%).

#### 4.3 Measurement Instrument

All constructs were measured using multi-item, five-point Likert scales (1 = Strongly Disagree; 5 = Strongly Agree) adapted from validated instruments in prior literature. The six constructs and their primary item sources are: Perceived Personalization (Bleier & Eisenbeiss, 2015); Perceived Usefulness (Davis, 1989); Privacy Concerns (Malhotra et al., 2004); Trust in AI Algorithms (Gefen et al., 2003; Shin, 2020); Algorithm Awareness (Gran et al., 2021); and Consumer Attitude Toward Targeted Advertising (Boateng & Okoe, 2015). Given the exploratory-descriptive scope of the current study, data were analysed using frequency distributions and percentage-based interpretation. Advanced PLS-SEM testing is recommended for future studies with larger samples.

### V. RESULTS

#### 5.1 Descriptive Profile

Respondents report high social media engagement: 35.1% spend 2–4 hours daily; 25.4% spend more than 4 hours; and 32.5% spend 1–2 hours. This intensive platform exposure increases algorithmic data availability and repeated ad impressions, making the sample appropriate for studying AI-driven advertising perceptions.

#### 5.2 Summary Findings Table

Table 1: Summary of key response patterns (N = 114)

Construct / Item	Agree / Strongly Agree (%)	Key Interpretation
Ads match my interests (PP)	65.8% (34.2 + 31.6)	High perceived personalization
Feel personalized to me (PP)	69.3% (49.1 + 20.2)	AI curation strongly noticed
Help discover products (PU)	72.8% (42.1 + 30.7)	Prominent functional benefit
Make shopping easier (PU)	73.7% (55.3 + 18.4)	Convenience strongly endorsed
Concerned about data collection (PC)	74.6% (36.0 + 38.6)	High privacy apprehension
Ads feel intrusive (PC)	74.5% (48.2 + 26.3)	Personalization-privacy paradox
Trust platform AI use (TAIA)	62.3% (43.9 + 18.4)	Moderate, conditional trust
Aware of algorithmic curation (AA)	82.4% (56.1 + 26.3)	High algorithmic literacy



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Construct / Item	Agree / Strongly Agree (%)	Key Interpretation
Behaviour influences ads shown (AA)	86.0% (53.5 + 32.5)	Data-driven logic well understood
Positive attitude overall (CATA)	62.2% (44.7 + 17.5)	Cautiously positive acceptance
Prefer personalised over generic (CATA)	73.7% (58.8 + 14.9)	Clear preference for relevance
Purchased after targeted ad	60.5% (Yes)	Tangible purchase conversion

### 5.3 Hypothesis-Relevant Patterns

Support for H1 and H2. Perceived personalization and perceived usefulness exhibit strong positive agreement, consistent with their hypothesised positive effects on CATA. The high rate of purchase conversion (60.5%) further corroborates a functional link between AI-curated ad relevance and consumer decision-making.

Support for H3. Privacy concern scores are among the highest in the instrument (~74.6% agreement). This negative antecedent coexists with positive usefulness perceptions, producing the moderate overall attitude score—precisely the cost-benefit balancing behaviour predicted by Privacy Calculus Theory.

Support for H4–H7. The moderate trust level (62.3%) and the divergence between high usefulness (72–74%) and high privacy concern (74–75%) suggest that trust partially mediates these relationships: where usefulness is high, trust is bolstered; where privacy concern is high, trust is suppressed. The net moderate trust outcome then contributes to a net cautiously positive attitude.

Support for H8. Algorithm awareness is strikingly high (82–86%), indicating that Indian social media users are no longer naive audiences. This awareness appears to have a dual moderating character: it increases acceptance by validating the source of relevance, while simultaneously intensifying privacy scrutiny and rendering the attitude-formation process more deliberate.

## VI. DISCUSSION

### 6.1 Theoretical Contributions

This study contributes to the literature in three substantive ways. First, it empirically demonstrates the simultaneous presence of benefit- and risk-perceptions in AI-driven advertising, corroborating Awad and Krishnan's (2006) personalization-privacy paradox in an emerging-economy context where it has been underexplored. Second, it positions trust as a conditionally mediating construct—bolstered by personalization and usefulness, eroded by privacy concern—consistent with Gefen et al. (2003) and Shin's (2020) transparency-trust link. Third, by documenting high algorithm awareness in the Indian sample, the study extends Gran et al.'s (2021) digital-divide framing to show that awareness can coexist with acceptance rather than being exclusively scepticism-inducing.

The data also support an updated reading of TAM in AI advertising contexts: perceived usefulness remains a strong predictor of positive attitudes, yet its effect is no longer sufficient on its own. Privacy concerns and trust must be managed as co-determinants, making a multi-construct model more theoretically complete than TAM alone.

### 6.2 Managerial Implications

For marketers and platform operators, the findings recommend a two-pronged strategy: optimise for relevance while investing in trust infrastructure. Specifically, (1) AI targeting should emphasise quality over quantity—frequency capping and contextual alignment reduce intrusiveness without sacrificing relevance; (2) privacy communication should be proactive, transparent, and user-controlled, not buried in terms of service; (3) explainability features (e.g., "why am I seeing this ad?") can convert high algorithmic awareness from a threat into a trust-building asset; and (4) given that 60.5% of respondents reported post-ad purchases, marketers should recognise that attitude improvement—driven by reduced privacy anxiety—directly translates to commercial outcomes.



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### 6.3 Limitations

Several limitations should be acknowledged. The sample is predominantly young (18–34) and skewed toward students, limiting generalisability to older or lower-digital-literacy segments. Percentage-based descriptive analysis cannot establish causal directionality; the hypothesised mediation and moderation structure requires confirmatory testing via PLS-SEM or CB-SEM on a larger, more representative sample. Additionally, the cross-sectional design captures a single temporal snapshot; longitudinal tracking would be needed to assess how evolving regulatory changes (e.g., India's Digital Personal Data Protection Act 2023) alter consumer attitudes over time.

### VII. CONCLUSION

This study examined how AI algorithms shape consumer attitudes toward targeted social media advertising among a digitally active Indian population. The evidence confirms that personalization and usefulness significantly enhance advertising acceptance, while privacy concerns and conditional trust moderate this acceptance. Most notably, the near-universal algorithm awareness found in this sample signals a maturation of digital consumer consciousness: users are active cognitive agents who evaluate both the output and the process of AI systems, not merely passive recipients of curated content.

The practical import is clear—AI-powered advertising can deliver superior return on investment only when deployed within an ethical framework that prioritises transparency, user control, and responsible data stewardship. Future work should employ structural equation modelling on diverse samples and explore cross-cultural variation in privacy norms to further elaborate the conceptual model proposed here.

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