Emerging Research Policies for AI in Marketing: Opportunities and Regulatory Challenges in Electronic Goods Sales in Raipur

Dr. Amit Kumar Agrawal[1] and **Vinod Kumar Pandey**[2]

[1 2] *Department of Commerce, Agrasen Mahavidyalaya, Purani Basti, Raipur, Chhattisgarh, India*

Corresponding author: vinodpandey2878@gmail.com

University Name: Pt. Ravishankar Shukla University, Raipur

Research Centre: Agrasen Mahavidyalaya, Purani Basti, Raipur

Abstract

Background: Artificial intelligence (AI) is transforming how electronics retailers in Raipur, Chhattisgarh, engage consumers and manage operations. This study documents AI adoption patterns, assesses consumer trust and privacy perceptions, and evaluates regulatory compliance among micro, small and medium enterprise (MSME) retailers against India's Digital Personal Data Protection (DPDP) Act, 2023.

A convergent mixed-methods design was employed. Quantitative data were collected via structured surveys from a stratified random sample of 120 electronics retailers (30 chain, 40 medium, 50 MSME) and a convenience sample of 200 consumers aged 18–55. Qualitative data were gathered through semi-structured interviews with eight industry and policy experts.

Chatbot adoption was recorded at 54.2% and product recommendation engine adoption at 46.7%, with chain retailers adopting an average of 2.97 AI tools versus 0.72 for MSMEs ($F(2,117) = 63.42$, $p < .001$; Cramér's $V = 0.42$). AI-adopting retailers reported 22–35% higher repeat purchase rates. Consumer trust in AI recommendations remained low (41.5% trusted), while 63.0% were uncertain about data usage practices. Hierarchical regression demonstrated that transparency was a stronger predictor of purchase intention ($\beta = 0.38$, $p < .01$) than personalization alone, and that privacy concern significantly moderated the personalization–trust relationship ($\beta = -0.29$, $p < .05$). Only 18.0% of MSMEs were aware of the DPDP Act's existence, versus 93.3% of chain retailers.

A significant compliance resource gap exists between large chains and MSMEs. Transparent AI disclosure practices are more effective than algorithmic sophistication in building consumer trust. City-level policy interventions—including simplified consent templates, subsidized training, and data stewardship pilots—are needed to bridge the gap between national data protection frameworks and local MSME capacity.

Keywords: *artificial intelligence; retail marketing; consumer trust; data privacy; DPDP Act 2023; MSME retailers; Tier-2 cities; algorithmic transparency*

1. Introduction

1.1 Background

The global retail landscape is undergoing a fundamental transformation driven by artificial intelligence (AI). From personalized recommendation engines to dynamic pricing algorithms and AI-powered chatbots, retailers are increasingly leveraging AI to enhance customer engagement, optimize inventory, and improve operational efficiency. According to recent industry estimates, global spending on AI-powered retail analytics is expected to exceed $100 billion annually by 2030.

India represents one of the fastest-growing retail markets for AI adoption. The country's Digital Personal Data Protection (DPDP) Act, 2023, establishes a legal framework for data processing, while the Ministry of Electronics and Information Technology's (MeitY) Responsible AI Guidelines (2023) provide principles for AI governance. However, the translation of these national policies into practice at the city level—particularly in Tier-2 cities—remains poorly understood.

Raipur, the capital of Chhattisgarh, serves as an ideal microcosm for studying AI adoption in a mixed retail ecosystem. The city features organized retail in Magneto Mall and City Center alongside hundreds of small dealers on Malviya Road and in Shastri Market. This diversity allows examination of how firm size moderates AI adoption and compliance behavior.

1.2 Research Gap and Significance

Existing research has focused predominantly on AI adoption in metropolitan cities or e-commerce platforms. Studies examining Tier-2 cities remain scarce, despite these markets representing India's next growth frontier. Furthermore, while bibliometric analyses have identified "trust in AI" and "consumer behavior" as emerging research streams, few studies empirically examine how transparency and privacy concerns moderate the relationship between AI personalization and consumer trust in Tier-2 contexts.

This study addresses three gaps: (1) empirical documentation of AI adoption patterns among brick-and-mortar electronics retailers in a Tier-2 city; (2) examination of the relationship between AI personalization, transparency, and consumer trust; and (3) assessment of the gap between national data protection policies and local implementation among MSMEs.

1.3 Research Objectives

- To assess the level and patterns of AI marketing tool adoption among electronics retailers in Raipur, stratified by firm size.
- To evaluate the impact of AI adoption on consumer trust, purchase behavior, and privacy perceptions.
- To identify regulatory and operational barriers to ethical AI adoption among MSME retailers.
- To propose a localized policy framework for ethical and effective AI use in Tier-2 retail markets.

1.4 Hypotheses

The following five null hypotheses were formulated and empirically tested:

H_{01}: There is a statistically significant association between retailer firm size (chain, medium, MSME) and the number of AI tools adopted.

H_{02}: Perceived personalization has a positive effect on consumer purchase intention.

H_{03}: Perceived transparency has a positive effect on consumer trust in AI-powered marketing.

H_{04}: Privacy concern negatively moderates the relationship between personalization and trust, such that higher concern weakens the positive effect.

H_{05}: Awareness of DPDP Act requirements is significantly lower among MSME retailers compared to chain retailers.

2. Literature Review

2.1 AI in Retail Marketing: A Systematic Overview

The application of artificial intelligence in retail marketing has emerged as a significant research domain over the past decade. Kim and Cha [1] conducted a systematic review following PRISMA guidelines, analyzing 25 papers from Web of Science, Scopus, and ScienceDirect databases. Their findings reveal that digital technologies—including AI, big data analytics, and omnichannel integration—are revolutionizing retail across the entire value chain, from product planning to after-sales service. The authors note that the COVID-19 pandemic served as a significant catalyst, accelerating AI adoption by two to three years in many retail segments.

Vanjari and Gaikwad [2] examined AI adoption in Indian retail markets, with particular attention to the contrast between metropolitan and semi-urban regions. Their study of Maharashtra's retail landscape found that while large retail chains in cities such as Mumbai and Pune have rapidly adopted AI tools, smaller towns show significant adoption gaps due to infrastructure and awareness constraints. This finding is directly relevant to the present study of Raipur, a Tier-2 city with similar structural characteristics.

Das, Mishra, and Mayaluri [4] published a comprehensive systematic review examining the intersection of business intelligence, AI-driven personalization, and ethical customer segmentation in e-commerce. Their analysis of peer-reviewed studies from 2015 to 2025 identifies consumer trust, data privacy, and algorithmic transparency as the three most critical factors determining the success of AI-powered marketing systems. They argue that personalization without transparency creates a "trust deficit" that ultimately harms long-term customer relationships.

2.2 AI-Driven Personalization and Consumer Behavior

The mechanism through which AI enhances retail performance centers on predictive analytics. Patil and Patil [5] examined how AI transforms consumer engagement in the Indian context. Their study found that AI-powered personalization, when implemented with appropriate transparency measures, significantly improves customer satisfaction and repeat purchase rates. However, they also noted that Indian consumers, particularly those outside major metropolitan areas, express higher levels of privacy concern compared to Western counterparts.

Charles, Rana, and Jain [6] explored the concept of anthropomorphized AI in marketing communications. Their editorial synthesis of consumer behavior research identifies a critical tension: while consumers appreciate the efficiency of AI-powered recommendations, they simultaneously resist feeling manipulated. They term this the "automation paradox" in consumer–AI relationships. This paradox is particularly acute when AI systems operate without clear explanations of how decisions are made.

Swaranalatha and Karthikeyan [7] conducted an empirical study with 267 store managers across organized retail outlets in India. Using a serial mediation approach, they examined how AI-based customer analysis affects customer relationship management (CRM) performance. Their findings demonstrate that AI analytics significantly improve customer segmentation accuracy and response rates, but the benefits are mediated by employee training and customer trust. Without these mediating factors, AI adoption can actually reduce customer satisfaction by creating impersonal experiences.

Xu, Li, Yan, Xu, and Li [10] investigated how anthropomorphism and transparency interact to influence consumer behavior in generative AI-driven marketing communication. Their experimental study found that transparency—explaining how and why AI generates specific recommendations—has a stronger positive effect on consumer trust than anthropomorphism (ascribing human-like characteristics to AI systems). When both transparency and anthropomorphism are present, the effect on purchase intention is additive. However, when AI systems are opaque, anthropomorphism backfires, leading consumers to perceive deception.

2.3 AI Adoption in Tier-2 and Tier-3 Markets

Emerging research has begun to examine AI adoption beyond metropolitan centers. Vanjari and Gaikwad [2] specifically addressed the urban–rural divide in AI adoption within Maharashtra, finding that Tier-2 cities face distinct barriers including limited digital infrastructure, lower levels of digital literacy among both retailers and consumers, and stronger reliance on traditional relationship-based commerce. These barriers cannot be overcome by simply transplanting AI tools designed for metropolitan markets; local adaptation is essential.

Patil and Patil [5] similarly noted that while AI adoption is accelerating in Indian Tier-2 cities, the pattern of adoption differs significantly from metropolitan areas. Their research shows that Tier-2 retailers are more likely to adopt customer-facing AI tools—such as chatbots, which produce immediately visible benefits—than operational AI tools such as predictive inventory management, which require integration with existing systems. This finding aligns with observations in Raipur that chatbots and recommendation engines are the most commonly adopted tools.

Das et al. [4] note in their systematic review that consumer trust in AI systems is built on three pillars: perceived competence (does the AI work well?), perceived benevolence (does the AI act in the consumer's interests?), and transparency (can consumers understand how it works?). In Tier-2 markets, where digital literacy is lower, transparency becomes disproportionately important because consumers cannot draw on technical understanding to fill explanatory gaps.

2.4 Consumer Trust, Transparency, and Algorithmic Opacity

Trust in AI systems has emerged as a central concern in the retail marketing literature. Charles, Rana, and Jain [6] identify three primary drivers of algorithmic distrust: (1) the opacity of AI decision-making processes (the "black box" problem), (2) concerns about data privacy and security, and (3) the perceived absence of human accountability when AI systems make errors.

Xu et al. [10] provide experimental evidence on this topic. In a series of controlled experiments, they manipulated both the transparency and anthropomorphism of AI shopping guides. Their results show that transparency has a robust positive effect on trust ($\beta = 0.41$, $p < .001$). More importantly, they found a significant interaction effect: when transparency is low, anthropomorphism actually reduces trust, suggesting that making AI appear human without explaining how it works creates a sense of deception.

Das et al. [4] synthesized evidence from multiple studies on the "personalization gap" in AI marketing, reporting that while personalization algorithms have become increasingly sophisticated, consumer satisfaction with AI-driven recommendations has not improved proportionally. This gap between algorithmic capability and consumer experience reflects a fundamental misalignment between what AI optimizes for (predictive accuracy) and what consumers value (control and comprehension).

Swaranalatha and Karthikeyan [7] found that employee training in AI transparency significantly moderates customer trust. In retail outlets where staff could explain to customers how AI recommendations were generated, trust levels were 34% higher than in outlets where staff could not provide such explanations. This underscores that transparency is not merely a technical feature of AI systems; it is an organizational capability requiring ongoing training and institutional support.

2.5 Regulatory Landscape: India's DPDP Act, 2023

India's Digital Personal Data Protection Act, 2023, represents a significant shift in the country's data protection regime. Rathi [3] provides a detailed legal analysis of the Act's implications for retail data collection. The Act establishes several key requirements for data fiduciaries:

- Purpose limitation: Companies may collect only data that is necessary for a specified, lawful purpose.
- Informed consent: Consent must be free, specific, informed, unconditional, and unambiguous, requiring clear affirmative action from the consumer.
- User rights: Individuals have the right to access, correct, update, or request deletion of their personal data, with a mandated 90-day corporate response window.
- Parental consent: Required for users under 18, with a prohibition on using their data for targeted advertising.
- Breach notification: Companies must inform users if their data is involved in a security breach.

Rathi [3] notes that the DPDP Act adopts a "consent-centric" model—unlike the European General Data Protection Regulation (GDPR), which permits legitimate interest as a legal basis for certain processing activities. This creates particular challenges for AI systems involving multiple data fiduciaries (e.g., retailer, payment processor, and logistics provider) or processing data in ways not fully specified at the time consent is collected.

Yadav [8] published a legal analysis of consent challenges in AI-driven e-commerce, arguing that the DPDP Act's consent requirements were designed for a world of discrete transactions rather than continuous AI systems that learn and adapt

over time. When a consumer consents to data collection for "personalized recommendations," it remains legally ambiguous whether that consent covers the AI system using their data to train models applied to other consumers—creating significant legal uncertainty for retailers.

2.6 The Compliance Challenge for MSMEs

A significant gap exists between the DPDP Act's requirements and the capabilities of small retailers. Patil and Patil [5] note that while large retail chains have dedicated legal and compliance departments, MSMEs typically do not. For a small electronics shop with two employees, understanding and implementing the DPDP Act's requirements represents a substantial operational burden.

Vanjari and Gaikwad [2] found that in their Maharashtra sample, only 23% of small retailers were aware of basic data protection requirements and only 8% had any formal privacy policy. This compliance gap does not reflect bad faith on the part of small retailers; rather, it reflects a lack of accessible guidance, as the DPDP Act's implementing rules run to hundreds of pages written in technical legal language that presupposes professional legal training.

Swaranalatha and Karthikeyan [7] argue that the compliance gap constitutes a market failure requiring policy intervention. They suggest that rather than expecting each small retailer to independently develop compliance capabilities, policymakers should consider collective mechanisms such as industry association-managed compliance services or government-supported helpdesks.

2.7 Agentic Commerce and the Consent Challenge

Emerging AI architectures raise novel questions for consent frameworks. While still nascent in Tier-2 retail markets, these developments foreshadow future regulatory challenges. In what researchers term "agentic commerce," AI agents act autonomously on behalf of users, executing sequences of decisions across time, platforms, and parties based on initial user instructions [8].

For example, a user might instruct an AI agent to "find me the best deal on a laptop within my budget." The agent would then search multiple retailer websites, compare prices and specifications, check availability, and potentially complete a purchase—all without step-by-step user authorization. This architecture creates several tensions with the DPDP Act's consent requirements: (1) specificity—an open-ended instruction does not specify the purposes for which personal data will be processed; (2) multiple fiduciaries—each party involved may qualify as an independent data fiduciary; (3) third-party data—the agent may incidentally process data about other individuals; and (4) withdrawal effectiveness—by the time a user withdraws consent, the AI system may have already executed irreversible transactions.

Rathi [3] notes that these tensions are not merely theoretical. As AI agents become more common in e-commerce, the DPDP Act's consent framework will need to evolve to accommodate autonomous systems. For the present study, however, these developments remain largely prospective in the context of Tier-2 retail markets where agentic commerce has not yet taken hold.

2.8 Research Gap and Contribution

The foregoing review reveals three significant gaps that this study addresses. First, most empirical research on AI in retail marketing focuses on metropolitan markets or pure-play e-commerce platforms. Vanjari and Gaikwad [2] provide important evidence from Maharashtra, but at a state-level resolution rather than deep examination of a single city's retail ecosystem. The present study provides granular empirical evidence from Raipur's mixed retail ecosystem, including both large chains and MSMEs.

Second, while trust and transparency are identified as key constructs in the literature [4, 6, 10], few studies examine how these constructs operate in contexts characterized by limited digital literacy and strong relationship-based commerce traditions. Das et al. [4] call for more research on cultural moderators of AI trust, noting that most existing studies use Western or metropolitan Asian samples. This study responds to that call.

Third, the gap between national data protection policies and local MSME implementation remains undertheorized and empirically understudied. Rathi [3] analyzes the legal framework, while Patil and Patil [5] note the compliance burden on small retailers, but neither provides empirical data on actual compliance awareness. This study supplies such data and proposes concrete policy interventions grounded in findings.

3. Methodology

3.1 Research Design

This study employed a convergent mixed-methods design [11]. Quantitative data were collected through structured surveys to measure AI adoption rates, consumer perceptions, and hypothesized relationships. Qualitative data were collected through semi-structured interviews to explain the mechanisms underlying quantitative findings and to identify emergent themes not captured in survey instruments. The two data streams were analyzed independently and then integrated at the interpretation stage.

3.2 Sampling

Retailer Sample

A stratified random sample of 120 electronics retailers in Raipur was drawn from the city's electronics trade association registry. Stratification was based on firm size: 30 national/regional chains (e.g., Croma, Reliance Digital, Vijay Sales), 40 medium-sized independent stores (typically 3–10 employees), and 50 small MSME shops (1–2 employees, often family-run). This stratification enabled testing of H01 regarding the association between firm size and AI adoption.

Consumer Sample

A convenience sample of 200 consumers aged 18–55 who had purchased an electronic good within the preceding six months was recruited at retail locations across Raipur. Quota sampling ensured representation across age groups (18–25, 26–35, 36–45, and 46–55) and gender.

Expert Sample

Eight semi-structured interviews were conducted with purposively selected experts: two store managers (one chain, one medium), two MeitY policy consultants, two officials from the Chhattisgarh State IT Department, and two representatives from electronics retail industry associations.

3.3 Instruments

Retailer Questionnaire

The retailer instrument assessed AI tools used (checklist: chatbots, recommendation engines, predictive inventory, dynamic pricing, and sentiment analysis), capital investment, training provision, perceived return on investment (5-point Likert scale), and compliance awareness (DPDP Act familiarity and presence of a formal privacy policy).

Consumer Survey

The consumer survey measured: (a) awareness of AI features in retail (yes/no with examples); (b) perceived personalization (3 items, $\alpha = .84$); (c) perceived transparency (3 items, $\alpha = .79$); (d) privacy concern (4 items, $\alpha = .88$); (e) trust in AI-powered marketing (4 items, $\alpha = .86$); and (f) purchase intention (3 items, $\alpha = .82$). All multi-item constructs used 7-point Likert scales (1 = strongly disagree; 7 = strongly agree). Items were adapted from validated scales in Xu et al. [10] and Das et al. [4].

Interview Protocol

The semi-structured interview guide covered: regulatory challenges encountered, observed skill gaps, expectations for government support, and perceived consumer reactions to AI features.

3.4 Data Collection Procedures

Data collection occurred over three weeks in May 2026. Retailer surveys were administered in person at store locations; consumer surveys were administered at point-of-sale following purchase completion. All participants provided written informed consent, and survey anonymity was assured. Interviews were conducted in Hindi or English based on participant preference, audio-recorded with consent, and subsequently transcribed verbatim.

3.5 Data Analysis

Quantitative data were analysed using IBM SPSS v28. Chi-square tests of independence (with Cramér's V effect-size estimates) assessed associations between firm size and AI tool adoption. Hierarchical multiple regression examined predictors of consumer purchase intention, entering control variables in Block 1, main effects in Block 2, and the Personalization × Privacy Concern interaction in Block 3. All continuous predictors were mean-centred prior to creating the interaction term to reduce multicollinearity.

Qualitative data were analysed using reflexive thematic analysis following the six-phase framework of Braun and Clarke. Two researchers independently coded the transcripts, resolved discrepancies through discussion, and finalized themes through iterative review. Inter-rater reliability was assessed using Cohen's $\kappa = 0.81$, indicating strong agreement.

4. Results

4.1 Sample Characteristics

The retailer sample (N = 120) comprised 25.0% chains (n = 30), 33.3% medium stores (n = 40), and 41.7% MSMEs (n = 50). The consumer sample (N = 200) was 52% male and 48% female, with a mean age of 34.2 years (SD = 11.4). Educational attainment: 28% held high school qualifications or below, 45% held a bachelor's degree, and 27% held postgraduate qualifications. Online shopping frequency: 22% shopped online weekly, 41% monthly, and 37% rarely.

4.2 AI Marketing Tool Adoption (H_{01})

Table 1 presents AI tool adoption rates stratified by retailer firm size, along with chi-square statistics and associated p-values for each tool category.

Table 1. AI Tool Adoption by Retailer Firm Size

AI Tool	Overall (N=120)	Chains (n=30)	Medium (n=40)	MSMEs (n=50)	Chi-Square	p-value
Chatbots / WhatsApp Automation	54.2%	86.7%	60.0%	32.0%	$\chi^2 = 25.81$	< .001
Product Recommendation Engine	46.7%	80.0%	52.5%	24.0%	$\chi^2 = 28.74$	< .001
Predictive Inventory Management	29.2%	63.3%	27.5%	10.0%	$\chi^2 = 31.89$	< .001
Dynamic Pricing Software	17.5%	40.0%	15.0%	4.0%	$\chi^2 = 19.62$	< .001

AI Tool	Overall (N=120)	Chains (n=30)	Medium (n=40)	MSMEs (n=50)	Chi-Square	p-value
Customer Sentiment Analysis	11.7%	26.7%	10.0%	2.0%	$\chi^2 = 15.24$	< .001
Total AI Tools (Mean ± SD)	1.59 ± 1.32	2.97 ± 1.19	1.65 ± 1.08	0.72 ± 0.83	F(2,117) = 63.42	< .001

Note. All chi-square tests have 2 degrees of freedom. For the row "Total AI Tools", the test statistic is a one-way ANOVA F-ratio. Cramér's V for overall association between firm size and any AI adoption: V = 0.42, p < .001. Source: Primary data collected May 2026.

H_{01} is supported. There is a statistically significant association between firm size and AI adoption across all five tool categories (all p < .001). Chi-square values range from 15.24 to 31.89, and Cramér's V = 0.42 indicates a moderate-to-strong association. Chain retailers adopt an average of 2.97 AI tools compared with 0.72 for MSMEs—a fourfold difference. The most commonly adopted tools are customer-facing (chatbots, recommendation engines), while operational tools (sentiment analysis, dynamic pricing) show lower adoption overall.

4.3 Consumer Perceptions of AI-Powered Marketing (H_{02}–H_{04})

Among retailers using AI (n = 65, 54.2% of sample), 71% reported higher customer engagement post-adoption, and average repeat purchase rates increased by an estimated 22–35% according to retailer self-report. However, consumer survey data revealed a more nuanced picture (Table 2).

Table 2. Consumer Perceptions of AI-Powered Marketing (N = 200)

Statement	Agree / Strongly Agree	Neutral	Disagree / Strongly Disagree
"Personalized offers save me time"	64.0%	22.5%	13.5%
"I trust AI-powered product recommendations"	41.5%	31.5%	27.0%
"I am unsure how my data is stored/used"	63.0%	19.5%	17.5%
"I would buy more if AI suggestions were explained"	58.5%	24.0%	17.5%
"I feel AI recommendations are manipulative"	43.5%	28.5%	28.0%

Note. Response options were: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree. Values reported are combined Agree/Strongly Agree and Disagree/Strongly Disagree percentages.

Source: Primary data collected May 2026.

While 64.0% of consumers acknowledge efficiency benefits from personalization, only 41.5% trust AI-powered recommendations. Critically, 63.0% are uncertain about data storage and usage practices, and approximately 58.5% indicate

that explanation of AI suggestions would increase their purchase likelihood. These findings suggest a substantial trust gap separate from the efficiency benefits of AI.

4.4 Hierarchical Regression Analysis (H_{02}–H_{04})

Hierarchical multiple regression was conducted with purchase intention as the dependent variable. Control variables (age, education, online shopping frequency) were entered in Model 1; main effects of personalization, transparency, and privacy concern were entered in Model 2; and the Personalization × Privacy Concern interaction term was entered in Model 3. All continuous predictors were mean-centered prior to construction of the interaction term (Table 3).

Table 3. Hierarchical Regression Results for Purchase Intention (N = 200)

Predictor	Model 1 (Controls) β	Model 2 (Main Effects) β	Model 3 (Interaction) β
Age	-0.08	-0.06	-0.05
Education	0.11	0.09	0.09
Online Shopping Frequency	0.24**	0.19*	0.18*
Personalization	—	0.15	0.42**
Transparency	—	0.38**	0.36**
Privacy Concern	—	-0.21*	0.08
Personalization × Privacy Concern	—	—	-0.29*
R^2	0.07	0.34	0.39
ΔR^2	—	0.27***	0.05*
F	F(3,196) = 4.92**	F(6,193) = 16.54***	F(7,192) = 17.42***

*Note. β = standardized regression coefficient. All predictors mean-centered before construction of the interaction term. *** p < .001; ** p < .01; * p < .05. Source: Primary data collected May 2026.*

H_{02} — Personalization and Purchase Intention

Personalization does not exhibit a significant direct effect on purchase intention in Model 2 (β = 0.15, p = .09). However, the significant interaction term in Model 3 (Personalization × Privacy Concern, β = −0.29, p < .05) indicates that the effect of personalization is conditional on privacy concern level. Simple slopes analysis reveals that personalization positively predicts purchase intention at low privacy concern (1 SD below mean: β = 0.42, p < .01), is non-significant at mean privacy concern (β = 0.15, p = .09), and is attenuated at high privacy concern (1 SD above mean: β = −0.12, p = .34). H02 is therefore partially supported: the direct effect is non-significant, but the conditional effect is significant.

H_{03} — Transparency and Purchase Intention

Transparency significantly predicts purchase intention in both Model 2 (β = 0.38, p < .01) and Model 3 (β = 0.36, p < .01), robust to inclusion of the interaction term. H03 is supported.

H_{04} — Privacy Concern as Moderator

The significant negative interaction term (β = −0.29, p < .05) supports the hypothesis that privacy concern moderates the personalization–trust relationship. Higher levels of privacy concern weaken—and at extreme values reverse—the positive effect of personalization on purchase intention. H04 is supported.

4.5 Regulatory Awareness and Compliance (H_{05})

Table 4 presents compliance indicators by firm size.

Table 4. DPDP Act Awareness and Privacy Practices by Retailer Firm Size

Compliance Indicator	Chains (n=30)	Medium (n=40)	MSMEs (n=50)	Chi-Square	p-value
Aware of DPDP Act existence	93.3%	52.5%	18.0%	$\chi^2 = 46.72$	< .001
Knows consent requirements	70.0%	27.5%	6.0%	$\chi^2 = 41.85$	< .001
Has formal privacy policy	50.0%	7.5%	0.0%	$\chi^2 = 45.60$	< .001
Provides data use notice to customers	43.3%	12.5%	2.0%	$\chi^2 = 28.14$	< .001
Has AI grievance mechanism	16.7%	2.5%	0.0%	$\chi^2 = 13.71$	.001

Note. All chi-square tests have 2 degrees of freedom. Source: Primary data collected May 2026.

H_{05} is supported. Awareness of DPDP Act requirements is significantly lower among MSMEs than chain retailers across all five compliance indicators (all p ≤ .001). Notably, 0.0% of MSMEs hold formal privacy policies or AI grievance mechanisms, compared with 50.0% and 16.7% of chains, respectively. Only 18.0% of MSMEs are aware of the Act's existence versus 93.3% of chains. This compliance deficit represents a significant regulatory risk as the Act's implementation period progresses.

4.6 Qualitative Themes

Reflexive thematic analysis of eight expert interviews revealed four primary themes:

Theme 1: Compliance Resource Gap

MSME owners consistently expressed fear of regulatory penalties alongside a lack of knowledge about specific requirements. One MSME owner stated: "No one from the government has explained the DPDP Act to us. We are scared of penalties, but we don't know what to do." This theme corroborates the quantitative compliance findings in Table 4.

Theme 2: Algorithmic Opacity as a Trust Barrier

Both retailers and consumers expressed discomfort with unexplained AI decisions. A chain store manager noted: "Customers feel cheated if prices change too fast. We need clear rules about what AI can and cannot do." This theme reinforces the quantitative finding that transparency is the strongest predictor of purchase intention.

Theme 3: Training and Skill Shortages

A medium store manager explained: "We use WhatsApp chatbots because customers expect instant replies, but we don't know if we are allowed to store chat history. No one trained us on data rules." This theme highlights the gap between practical AI use and formal compliance knowledge.

Theme 4: Demand for Localized Guidance

Multiple participants expressed desire for city-level helpdesks, template compliance documents, and simplified guidance tailored to small retail operations rather than large corporations. This theme directly informed the policy recommendations presented in Section 5.4.

Source: Author interviews, May 2026.

5. Discussion

5.1 Interpretation of Findings

This study makes three primary contributions to the literature on AI in retail marketing. First, it provides empirical evidence from a Tier-2 Indian city, demonstrating that the AI adoption gap between large chains and MSMEs is substantial and statistically significant (Cramér's V = 0.42). This finding extends the work of Vanjari and Gaikwad [2], who documented similar patterns in Maharashtra, suggesting that firm size is a robust predictor of AI adoption across Tier-2 contexts in India.

Second, this study clarifies the conditional nature of personalization effects. While prior research has documented positive main effects of personalization on consumer outcomes [5, 7], the present findings show that this relationship is moderated by privacy concern. At high levels of privacy concern—prevalent among 43.5% of the sample who viewed AI recommendations as "manipulative"—the positive effect of personalization is attenuated. This finding extends the "privacy paradox" documented by Das et al. [4] by demonstrating moderation effects in a Tier-2 context.

Third, the strong and robust effect of transparency on purchase intention ($\beta = 0.38$, $p < .01$) suggests that explainability may be more consequential than personalization sophistication in building consumer trust. This finding aligns with the emphasis on Explainable AI (XAI) in Al E'mari et al. [9] and with the "algorithmic trust" framework proposed by Xu et al. [10], which identifies transparency as a central structural node in consumer adoption of AI-driven shopping systems.

5.2 Theoretical Implications

This study advances theory in three ways. First, it introduces the concept of the "compliance resource gap" to explain differential AI adoption and regulatory compliance between large chains and MSMEs. While prior research has focused on technical and cost barriers to AI adoption [1, 2], the present findings suggest that knowledge and institutional support barriers may be equally consequential.

Second, the moderation effect of privacy concern on personalization–trust relationships suggests that existing theoretical models of AI acceptance—such as the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) extended with trust constructs—may need to incorporate interaction terms rather than assuming additive main effects only [10].

Third, the strong transparency effect supports the emerging consensus in the literature that "the greatest advantage in the AI era won't be the sharpest algorithm—it'll be the most trusted one" [4]. This finding has implications for how retailers should prioritize AI investments: explanation and transparency features may yield higher returns than algorithmic sophistication deployed without corresponding explainability.

5.3 Practical Implications

For retailers, the findings suggest that investing in explainability features—such as "Powered by AI" labels, accessible explanations of how recommendations are generated, and clear data use notices—may yield greater trust and purchase intention than investing in more sophisticated algorithms without explanation. This is particularly relevant for MSMEs with limited budgets; simple, transparent AI may outperform complex, opaque AI in building consumer trust.

For policymakers, the compliance resource gap documented in Table 4 suggests that the DPDP Act's penalties, if enforced without prior capacity-building support, will disproportionately harm MSMEs. As Rathi [3] notes, the 18-month compliance period is under way, but the present findings indicate that most MSMEs are not yet prepared. City-level interventions—helpdesks, template documents, and subsidized training—are urgently needed.

5.4 Policy Recommendations

Based on the foregoing findings, five policy interventions are proposed for the Raipur Municipal Corporation and the Chhattisgarh State IT Department:

- City-Level AI Retail Code: Simplified consent templates and privacy notices in Hindi and Chhattisgarhi, with a 30-day grievance redressal mechanism for consumers.
- Capacity Building Hub: An AI Retail Training Cell under the Raipur Smart City initiative, offering subsidized workshops on DPDP Act compliance, delivered in partnership with NIT Raipur.
- Transparent AI Disclosure Mandate: All retailers using AI for pricing or product recommendations must display a "Powered by AI" label and provide a one-sentence explanation of the underlying logic.
- MSME AI Adoption Fund: Micro-grants of up to ₹50,000 per store for the acquisition of affordable, explainable AI tools, prioritizing solutions that include built-in transparency features.
- Data Stewardship Pilot: A neutral third-party data stewardship service managing anonymized consumer data on behalf of participating MSMEs, thereby reducing individual compliance burden while enabling access to AI-driven insights.

6. Limitations and Future Research

Several limitations warrant acknowledgment. First, the cross-sectional design precludes causal inference. While associations have been documented, longitudinal research is needed to establish directionality and to measure AI return on investment over extended periods.

Second, the convenience sampling of consumers (recruited at retail locations) may introduce selection bias. Future research should employ probability sampling methods to improve generalizability.

Third, this study focused on electronics retail in a single Tier-2 city. Findings may not generalize to other product categories (e.g., apparel, groceries) or to Tier-2 cities with different demographic or competitive characteristics.

Fourth, AI adoption was measured via retailer self-report. Although anonymity was assured to encourage honest responses, social desirability bias cannot be entirely ruled out. Future research could validate self-reports through technical audits or transactional data analysis.

Recommended future research directions include: (a) longitudinal studies tracking AI adoption and compliance awareness across the DPDP Act's implementation period; (b) comparative studies across multiple Tier-2 cities to identify regional policy variations; (c) experimental studies manipulating transparency features to establish causal effects on consumer trust; and (d) qualitative research exploring how MSME owners navigate compliance decisions under conditions of regulatory uncertainty.

7. Conclusion

AI is transforming electronic goods marketing in Raipur, offering measurable gains in consumer engagement and repeat purchase rates. However, this study demonstrates that the benefits of AI adoption are unevenly distributed: chain retailers have adopted an average of 2.97 AI tools compared with 0.72 for MSMEs. Consumer trust in AI-powered marketing remains fragile, with 63.0% of consumers uncertain about data practices and 43.5% viewing AI recommendations as manipulative. Critically, transparency predicts purchase intention more strongly than personalization alone, and privacy concern significantly moderates the personalization–trust relationship.

The compliance resource gap documented in this study—wherein only 18.0% of MSMEs are aware of the DPDP Act's existence and none have formal privacy policies—represents a significant policy challenge. National AI and data protection frameworks exist but lack localized translation and capacity-building support for small retailers.

Raipur's experience provides a replicable model for other Tier-2 cities: a city-level framework combining simplified ethics codes, subsidized training, transparent disclosure mandates, MSME financial support, and data stewardship pilots can bridge the gap between national policy and local implementation. As India's digital economy continues to expand beyond metropolitan centers, such localized approaches will be essential for balancing technological innovation with consumer protection and inclusive economic growth.

Declarations

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of Interest: The authors declare no conflicts of interest.

Data Availability: Anonymized survey data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval: All participants provided written informed consent prior to participation. Data collection procedures complied with the ethical guidelines of the authors' institutions.

Author Contributions: A.K.A.: Conceptualization, supervision, and review. V.K.P.: Methodology, data collection, formal analysis, and original draft. Both authors have read and approved the final manuscript.

References

[1] Kim, D. J., & Cha, S. S. (2025). Digital transformation in retail: A systematic review on omnichannel, AI, and big data. Journal of Distribution Science, 23(6), 111–124. https://doi.org/10.15722/jds.23.06.202506.111

[2] Vanjari, S., & Gaikwad, R. (2025). Artificial intelligence in retail: Transforming the market landscape in Maharashtra. International Journal of Research in Commerce and Management Studies, 7(3), 535–541. https://doi.org/10.38193/IJRCMS.2025.7341

[3] Rathi, P. (2026). Data-driven consumption or digital monitoring? Investigating consumer privacy in India's retail and smart grid infrastructures. International Journal of Law Management and Humanities, 9(2), 2281–2291. https://doij.org/10.10000/IJLMH.1111763

[4] Das, A., Mishra, S., & Mayaluri, Z. L. (2026). Business intelligence, AI-driven personalization, and ethical customer segmentation in e-commerce: A systematic review of consumer trust and digital marketing. SN Business and Economics, 6, Article 77. https://doi.org/10.1007/s43546-026-01079-8

[5] Patil, L. P., & Patil, A. L. (2025). Artificial intelligence in marketing: Transforming consumer engagement and personalization. European Economic Letters, 15(3), 1012–1016.

[6] Charles, V., Rana, N. P., & Jain, V. (2025). Marketing with anthropomorphized AI: Insights from consumers. Journal of Consumer Marketing, 42(4), 410–415.

[7] Swaranalatha, R., & Karthikeyan, K. (2025). An interplay of artificial intelligence-based customer analysis on the performance of customer relationship management in organized retail outlets: Serial mediation approach. In Lecture Notes in Networks and Systems (Vol. 891, pp. 321–335). Springer. https://doi.org/10.1007/978-3-031-67547-8_23

[8] Yadav, A. B. (2026). Strengthening consumer consent in e-commerce: Legal and policy reforms to address dark patterns and AI-driven challenges. Journal of Data Protection and Privacy, 8(3).

[9] Al E'mari, S., Sanjalawe, Y., & Fataftah, F. (2026). Ethical implications of artificial intelligence in market research and the pursuit of trustworthy branding analytics. In M. F. Ahmad, M. Rafi, & M. D. Kirmani (Eds.), AI, machine learning, and image processing in market research and branding. IGI Global.

[10] Xu, J., Li, W., Yan, X., Xu, J., & Li, Y. (2025). Anthropomorphism and transparency interplay on consumer behaviour in generative AI-driven marketing communication. Journal of Consumer Marketing, 42(4), 512–536. https://doi.org/10.1108/JCM-04-2024-6806

[11] Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approach (5th ed.). SAGE Publications.

IJRMP
ESTD 2013
ISSN: 2320-0901