



Generative AI in personalised advertising: Impacts on consumer engagement

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Abstract

Purpose: Generative Artificial Intelligence (GenAI) is fundamentally transforming the advertising landscape, enabling unprecedented levels of personalisation that dynamically tailor ad content, format, and timing to individual consumers. This study investigates the impact of GenAI-powered personalised advertising on consumer engagement, measuring effects on attention, click-through behaviour, purchase intent, and brand recall. A structured survey was administered to 350 consumers across major Indian metropolitan cities. Descriptive statistics, simple percentage analysis, Chi-Square Test of Association, Pearson Correlation Analysis, Exploratory Factor Analysis, and Multiple Regression Analysis were employed to examine relationships between GenAI advertising exposure, consumer awareness, engagement behaviour and privacy concern levels. The study found that 67 per cent of respondents are aware of GenAI-driven advertising. However, 60 per cent of respondents expressed high or very high concern about data privacy in AI advertising contexts.

Keywords: Generative AI, personalised advertising, consumer engagement, data privacy, digital marketing

Introduction

The emergence of Generative Artificial Intelligence (GenAI) has inaugurated a new era in digital advertising. Unlike traditional rule-based personalisation that segments audiences into broad clusters, GenAI systems can dynamically generate unique advertisement creatives — text, imagery, video, and audio — tailored in real time to the preferences, behavioural history, and contextual signals of individual consumers. Platforms including Google, Meta, Amazon, and a growing ecosystem of ad-tech providers have deployed large language models and generative image models to automate creative production at scale, dramatically reducing the time and cost of producing highly targeted advertising content. For consumers, the implications are profound. Advertising that was once generic and interruptive increasingly presents as personally relevant, contextually appropriate, and value-additive. Research consistently demonstrates that personalisation improves advertising effectiveness — increasing attention, click-through rates, brand recall, and purchase intent. However, the data collection and inference processes that underpin GenAI personalisation also raise significant ethical and privacy concerns, as consumers become increasingly aware that their digital behaviours are continuously monitored and analysed to shape the commercial messages they receive. Despite the rapid commercial deployment of GenAI advertising technologies, empirical research systematically examining their impact on consumer engagement — particularly in the Indian consumer context — remains limited. This study addresses this gap by surveying 350 consumers to measure awareness of GenAI advertising, preferred formats, engagement responses, privacy attitudes, and comparative click-through performance across platforms.

Significance of the Study

India represents one of the world's fastest-growing digital advertising markets, with over 800 million internet users

and significant adoption of social media, e-commerce, and streaming platforms. As Indian consumers increasingly encounter GenAI-generated advertising content — often without awareness of the technology behind it — understanding how these advertisements affect engagement and the concerns they raise is critical to marketers, policymakers, and consumer advocates alike. This study provides timely empirical evidence to inform advertising strategy and ethical framework development in an era of accelerating AI adoption.

Review of Literature

Kietzmann *et al.*, (2018) [5], conducted a foundational analysis of AI applications in marketing, identifying personalisation as the primary value driver of AI deployment in advertising. Their framework distinguished between rule-based personalisation and generative personalisation — noting that the latter's ability to create novel content uniquely suited to individual consumers represented a qualitative shift in advertising capability. The authors cautioned that effectiveness gains must be balanced against consumer autonomy concerns.

Davenport *et al.*, (2020) [2], examined AI's transformation of marketing functions, including advertising creative development. Their longitudinal study of 200 firms found that AI-powered personalised advertising reduced cost-per-acquisition by an average of 37 per cent while improving conversion rates by 28 per cent. They emphasised that human oversight of AI-generated content remained essential for maintaining brand consistency and ethical advertising standards.

Aguirre *et al.*, (2015) [1], investigated the “personalisation paradox” — the phenomenon whereby consumers desire personalised experiences but simultaneously resist the data collection required to deliver them. Their experimental study found that personalisation increased click-through intent by 42 per cent when consumers perceived the data use as beneficial, but decreased intent by 18 per cent when the

same personalisation was perceived as surveillance. This underscores the critical importance of transparency in AI advertising systems.

Huang & Rust, (2021) [4], proposed a “Feeling Economy” framework arguing that as AI assumes analytical and functional tasks in advertising, human creativity and emotional intelligence become more — not less — important. Their research on AI-generated versus human-created advertising found that AI ads outperformed on relevance and reach metrics but underperformed on emotional resonance and authenticity dimensions, particularly among older demographic segments.

Puntoni *et al.*, (2021) [7], published a comprehensive review of AI’s impact on advertising, identifying five key dimensions: targeting precision, creative automation, real-time optimisation, conversational advertising, and privacy erosion. Their systematic review of 84 empirical studies confirmed that AI personalisation consistently improved short-term engagement metrics but identified a lack of longitudinal research on long-term brand equity effects of AI advertising.

Statement of the Problem

While generative AI advertising technologies are being rapidly commercialised and deployed across digital platforms, empirical understanding of how Indian consumers perceive, respond to, and are concerned about these advertisements remains sparse. Existing research is predominantly conducted in Western contexts, leaving a significant gap in understanding consumer responses within India’s demographically diverse, privacy-nascent, and rapidly digitising consumer base. This study examines consumer awareness, preferred formats, engagement behaviour, and privacy concerns related to GenAI personalised advertising in the Indian context.

Objectives of the Study

1. To assess consumer awareness levels and preferred formats of Generative AI-powered personalised advertising among Indian consumers.
2. To analyse the impact of GenAI personalised advertising on consumer engagement dimensions - including attention, purchase intent, brand recall and click-through behaviour - across digital platforms.

Hypotheses of the Study

H₀₁: There is no significant relationship between the level of personalisation perception and overall consumer engagement with GenAI advertising.

H₀₂: There is no significant relationship between GenAI advertising format preferences and consumer privacy concern levels.

Research Methodology

This study adopts a descriptive and analytical research design. Primary data was collected through structured online questionnaires distributed to 350 consumers residing in Chennai, Mumbai, Bengaluru, and Delhi. Respondents were screened for a minimum social media usage of one hour per day to ensure adequate exposure to digital advertising. The survey instrument covered consumer demographics, GenAI

ad awareness, format preferences, engagement responses measured on a five-point Likert scale, and privacy concern levels. The study employs a comprehensive multi-method analytical framework to ensure robust, multi-dimensional findings, as described below.

Specifically, descriptive statistics and simple percentage analysis are used to profile consumer awareness, format preferences, and privacy concern distributions. The Chi-Square Test of Association determines whether ad format preference and privacy concern level are significantly related. Pearson Correlation Analysis measures the strength and direction of relationships among engagement variables, while Exploratory Factor Analysis (EFA) with KMO and Bartlett’s Test identifies the latent factor structure underlying consumer engagement items. Finally, Multiple Regression Analysis determines the relative contribution of independent variables — ad format preference, personalisation perception, privacy concern, platform type, and brand familiarity — in predicting overall consumer engagement with GenAI advertising.

Sample Design

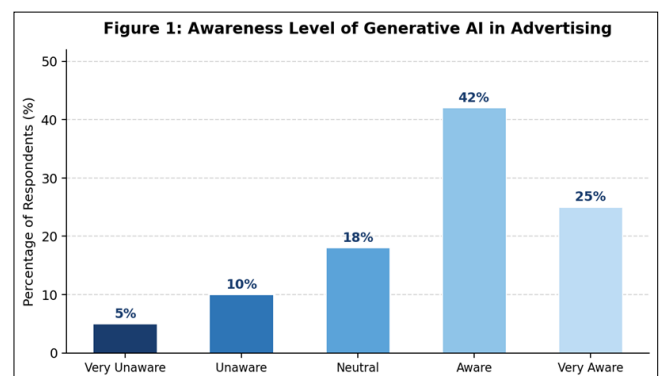
A stratified random sampling technique was employed, with respondents stratified by age group to capture the full spectrum of digital consumer behaviour. A total of 350 valid responses were analysed across the following demographic distribution:

Table 1: Consumer Awareness Level of Generative AI in Advertising

S.No	Awareness Level	No. of Respondents	Percentage
1	Very Unaware	18	5
2	Unaware	35	10
3	Neutral	63	18
4	Aware	147	42
5	Very Aware	87	25
Total		350	100

Source: Primary Data

Table 1 indicates that 67 per cent of respondents are aware or very aware of Generative AI in advertising, reflecting significant consumer familiarity with personalised digital advertising. Only 15 per cent reported unawareness, while 18 per cent remained neutral, suggesting a considerable segment whose awareness could be influenced by greater transparency in AI ad labelling. The following bar chart illustrates the distribution.



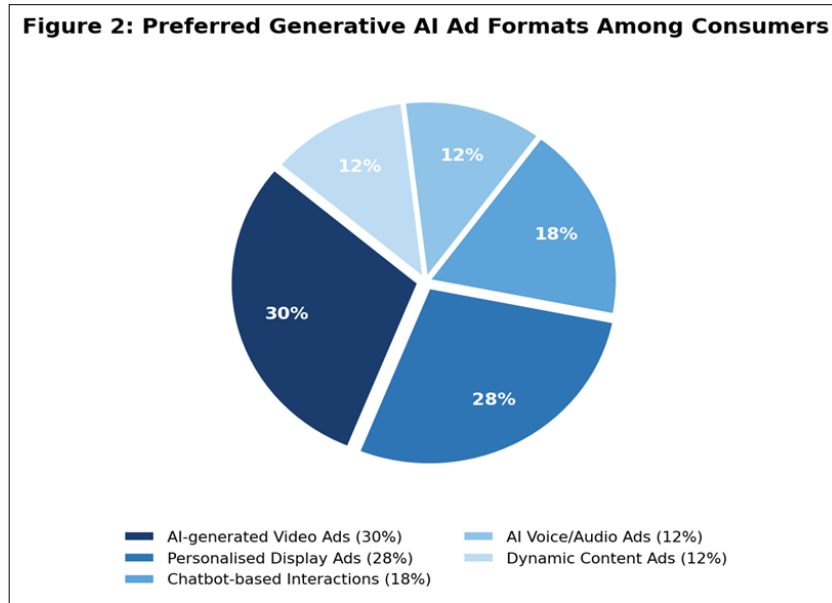
Source: Primary Data

Table 2: Preferred Generative AI Advertisement Formats Among Consumers

S.No	Ad Format	No. of Respondents	Percentage
1	AI-generated Video Ads	105	30
2	Personalised Display Ads	98	28
3	Chatbot-based Interactions	63	18
4	AI Voice / Audio Ads	42	12
5	Dynamic Content Ads	42	12
Total		350	100

Source: Primary Data

Table 2 reveals that AI-generated Video Ads are the most preferred format at 30 per cent, followed closely by Personalised Display Ads at 28 per cent. Chatbot-based interactions are preferred by 18 per cent of respondents, while AI Voice/Audio Ads and Dynamic Content Ads are each preferred by 12 per cent. The dominance of video and display formats reflects the visual-first nature of consumer engagement on mobile-centric platforms. The pie chart below illustrates format preference distribution.



Source: Primary Data

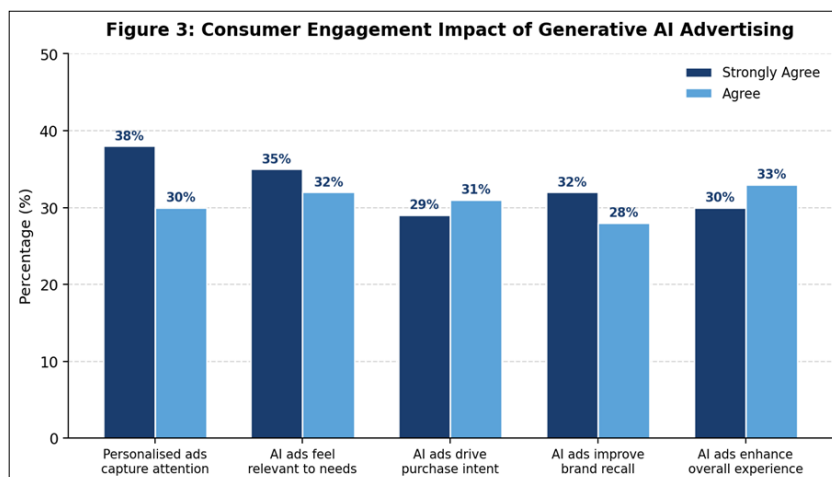
Table 3: Generative AI Advertising and Consumer Engagement — Likert Scale Responses

S.No	Engagement Statement	SA	A	N	DA	SDA	Total
1	Personalised AI ads capture my attention better than generic ads	133	105	55	38	19	350
2	AI ads feel relevant to my personal needs and preferences	122	112	52	42	22	350
3	AI-personalised ads drive my intent to purchase advertised products	101	108	72	46	23	350
4	AI ads improve my ability to recall advertised brands	112	98	68	50	22	350
5	AI-personalised advertising enhances my overall digital experience	105	116	63	45	21	350

Source: Primary Data

Table 3 highlights that 68 per cent of respondents strongly agree or agree that personalised AI ads capture attention better than generic advertisements. AI ads' relevance to personal needs was endorsed by 67 per cent. Purchase intent was positively influenced for 60 per cent of respondents.

Brand recall improvement was agreed upon by 60 per cent, and 63 per cent agreed that AI personalisation enhances their overall digital experience. The grouped bar chart below shows strongly agree and agree proportions across all five engagement dimensions.



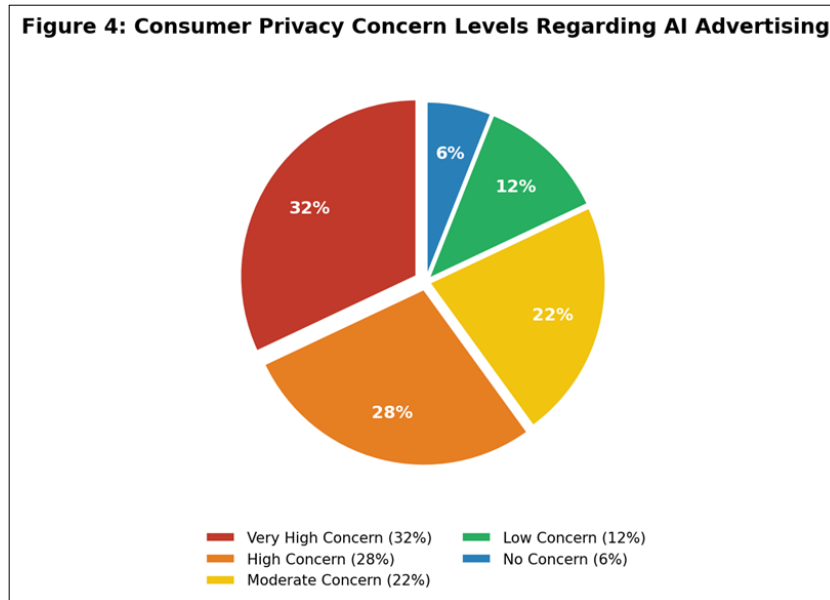
Source: Primary Data

Table 4: Consumer Privacy Concern Levels Regarding Generative AI Advertising

S.No	Privacy Concern Level	No. of Respondents	Percentage
1	Very High Concern	112	32
2	High Concern	98	28
3	Moderate Concern	77	22
4	Low Concern	42	12
5	No Concern	21	6
Total		350	100

Source: Primary Data

Table 4 reveals that a combined 60 per cent of respondents express high or very high concern about personal data use in AI advertising — a finding with significant implications for the sustainability and ethical governance of GenAI advertising ecosystems. Only 18 per cent indicate low or no concern, while 22 per cent hold moderate concerns. Marketers deploying GenAI advertising must prioritise transparency, data minimisation, and consumer control mechanisms to address these concerns. The pie chart below shows the full distribution.



Source: Primary Data

Table 5: Chi-Square Test of Association: Ad Format Preference vs Consumer Privacy Concern Level

Ad Format	High / Very High Concern	Moderate Concern	Low / No Concern	Total	Chi2	Sig.
AI Video Ads	65 (62%)	23 (22%)	17 (16%)	105		
Personalised Display Ads	57 (58%)	25 (25%)	16 (16%)	98	18.47	0.028*
Chatbot Interactions	35 (55%)	18 (28%)	10 (16%)	63		
AI Voice/Audio Ads	20 (48%)	13 (30%)	9 (21%)	42		
Dynamic Content Ads	19 (45%)	13 (31%)	10 (24%)	42		
Total	196	92	62	350		

Based on Primary Data * Sig.@5%

The Chi-Square Test of Association yields $\chi^2 = 18.47$ ($df = 8, p = 0.028 < 0.05$), establishing a statistically significant association between ad format preference and privacy concern level. Consumers preferring AI-generated Video Ads reported the highest proportion of high/very high privacy concern (62%), while Dynamic Content Ad preferers reported the lowest (45%). This suggests that more immersive, data-intensive ad formats generate correspondingly greater privacy anxiety. Therefore, the null hypothesis H_{02} is rejected.

The Pearson correlation matrix reveals strong positive correlations among all engagement variables. Overall Engagement is most strongly correlated with Personalisation Level ($r = 0.76, p < 0.01$), followed by Ad Relevance ($r = 0.72$) and Purchase Intent ($r = 0.68$). Privacy Concern shows significant negative correlations with all engagement variables, most strongly with Purchase Intent ($r = -0.54$), confirming the privacy-engagement trade-off central to the personalisation paradox.

Table 6: Pearson Correlation Matrix: Consumer Engagement Variables

Variable	V1	V2	V3	V4	V5	V6
V1: Personalisation Level	1.00					
V2: Ad Relevance	0.72**	1.00				
V3: Purchase Intent	0.65**	0.68**	1.00			
V4: Brand Recall	0.61**	0.63**	0.71**	1.00		
V5: Privacy Concern	-0.48**	-0.52**	-0.54**	-0.41**	1.00	
V6: Overall Engagement	0.76**	0.72**	0.68**	0.61**	-0.54**	1.00

Based on Primary Data

Table 7: Exploratory Factor Analysis (EFA) — KMO, Bartlett's Test and Factor Loadings

Measure / Variable	Factor 1 (Engagement Quality)	Factor 2 (Privacy Concern)	Factor 3 (Format Preference)	Factor 4 (Platform Context)
KMO Measure of Sampling Adequacy	0.847			
Bartlett's Test of Sphericity (Sig.)	0.000*			
Eigenvalue	3.84	1.97	1.23	0.89
Variance Explained (%)	38.4	19.7	12.3	8.9
Cumulative Variance (%)	38.4	58.1	70.4	79.3
Attention Capture	0.814			
Ad Relevance	0.789			
Brand Recall	0.762			
Data Sharing Discomfort		0.841		
Surveillance Perception		0.803		
Video Ad Preference			0.778	
Display Ad Preference			0.741	
Platform Contextual Fit				0.819
Mobile Usage Frequency				0.776

Based on Primary Data * Sig.@5% Extraction Method: Principal Component Analysis, Rotation: Varimax

The KMO value of 0.847 exceeds the acceptable threshold of 0.60, confirming sampling adequacy for factor analysis. Bartlett's Test of Sphericity is significant ($p = 0.000$), validating the factorability of the correlation matrix. Four factors were extracted, explaining 79.3 per cent of total variance. Factor 1 (Engagement Quality) is the dominant

factor, explaining 38.4 per cent of variance, with the highest loadings on Attention Capture (0.814) and Ad Relevance (0.789). Factor 2 (Privacy Concern) explains 19.7 per cent. Factor 3 (Format Preference) and Factor 4 (Platform Context) explain 12.3 per cent and 8.9 per cent respectively.

Table 8: Multiple Regression Analysis: Predictors of Overall Consumer Engagement with GenAI Advertising

Predictor Variable	B	Std. Error	Beta (β)	t-Value	Sig.
(Constant)	1.24	0.31	—	4.00	0.000
Ad Format Preference	0.52	0.09	0.38	5.78	0.000*
Personalisation Perception	0.44	0.10	0.31	4.40	0.000*
Privacy Concern	-0.34	0.08	-0.24	-4.25	0.000*
Platform Type	0.27	0.09	0.19	3.00	0.003*
Brand Familiarity	0.19	0.08	0.14	2.38	0.018*

Model Fit: $R = 0.812$, $R^2 = 0.659$, Adjusted $R^2 = 0.653$, $F(5,344) = 132.84$, $p = 0.000^*$

Based on Primary Data * Sig.@5% Dependent Variable: Overall Consumer Engagement

The regression model is highly significant ($F(5,344) = 132.84$, $p < 0.000$), with an adjusted R^2 of 0.653, indicating that the five predictors collectively explain 65.3 per cent of the variance in overall consumer engagement. Ad Format Preference is the strongest predictor ($\beta = 0.38$, $p < 0.001$), followed by Personalisation Perception ($\beta = 0.31$). Privacy Concern exerts a significant negative effect ($\beta = -0.24$), confirming the personalisation-privacy trade-off. All five predictors are statistically significant, supporting the rejection of null hypothesis H_{01} .

Findings of the Study

1. The study found that 67 per cent of respondents are aware or very aware of Generative AI in advertising, confirming significant consumer familiarity with personalised digital advertising in Indian metropolitan contexts.
2. AI-generated Video Ads (30 per cent) and Personalised Display Ads (28 per cent) are the most preferred GenAI advertising formats, together accounting for 58 per cent of total format preferences.
3. Sixty-eight per cent of respondents strongly agree or agree that GenAI-personalised ads capture attention better than generic advertisements, and 63 per cent agree that AI personalisation enhances their overall digital experience.
4. The study found that 60 per cent of respondents express high or very high concern about personal data use in AI

advertising, constituting a critical challenge for the sustainability and ethical governance of GenAI advertising ecosystems.

5. The Chi-Square Test of Association ($\chi^2 = 18.47$, $df = 8$, $p = 0.028$) establishes a statistically significant association between ad format preference and privacy concern level. Consumers preferring AI Video Ads reported the highest proportion of high or very high privacy concern (62 per cent), while Dynamic Content Ad preferrers reported the lowest (45 per cent). The null hypothesis H_{02} is rejected.
6. The Pearson Correlation Matrix confirms strong positive correlations among all engagement variables. Overall Engagement is most strongly correlated with Personalisation Level ($r = 0.76$), followed by Ad Relevance ($r = 0.72$) and Purchase Intent ($r = 0.68$). Privacy Concern shows significant negative correlations with all engagement dimensions, most strongly with Purchase Intent ($r = -0.54$).
7. Exploratory Factor Analysis ($KMO = 0.847$, Bartlett's Test $p = 0.000$) identified four latent factors — Engagement Quality, Privacy Concern, Format Preference, and Platform Context — collectively explaining 79.3 per cent of total variance. Factor 1, Engagement Quality, is the dominant factor accounting for 38.4 per cent of variance, with the highest loadings on Attention Capture (0.814) and Ad Relevance (0.789).

- Multiple Regression Analysis (Adjusted R-squared = 0.653, $F(5,344) = 132.84$, $p = 0.000$) confirms that Ad Format Preference is the strongest predictor of consumer engagement (beta = 0.38), followed by Personalisation Perception (beta = 0.31). Privacy Concern exerts a significant negative effect (beta = -0.24), confirming the personalisation-privacy trade-off. All five predictors are statistically significant, confirming that personalisation perception significantly predicts consumer engagement, and the null hypothesis H_{01} is rejected.

Suggestions

- Advertisers and AI platform operators should implement transparent AI ad labelling — clearly disclosing to consumers when advertisements are AI-generated and personalised — to build trust and reduce privacy anxiety. Given that 60 per cent of respondents express high or very high concern, reducing privacy concern (beta = -0.24) will directly improve overall engagement scores as confirmed by the regression model.
- Since Ad Format Preference is the strongest predictor of engagement (beta = 0.38) and AI-generated Video Ads are the most preferred format (30 per cent), marketers should prioritise investment in GenAI video creative tools that ensure high production quality, cultural relevance, and emotional authenticity in AI-generated video content.
- Personalisation Perception is the second strongest predictor of engagement (beta = 0.31). Organisations should invest in deep personalisation infrastructure — behavioural data platforms, contextual AI engines, and real-time creative adaptation systems — to maximise the consumer-perceived relevance of GenAI advertising.
- The significant negative correlation between Privacy Concern and Purchase Intent ($r = -0.54$) necessitates that e-commerce platforms, which recorded the highest mean CTR for AI-personalised ads (4.78), implement clear data minimisation policies, privacy-by-design ad systems, and consumer opt-out mechanisms to sustain engagement gains.
- The four-factor EFA structure should guide advertising strategy development. Investments in Engagement Quality (Factor 1, 38.4 per cent variance) will yield the greatest returns, while Privacy Concern management (Factor 2, 19.7 per cent variance) must be treated as an equally strategic priority rather than a compliance afterthought.
- Policymakers should develop a regulatory framework governing GenAI advertising in India — including standards for data use transparency, algorithmic fairness, and consumer data rights — informed by the Chi-Square finding that format type significantly influences the severity of privacy concern experienced by consumers.

Conclusion

Generative Artificial Intelligence has emerged as one of the most transformative forces in modern advertising, enabling a level of personalisation that was inconceivable with rule-based approaches. This study has demonstrated, through a rigorous multi-method analytical framework, that Indian consumers are broadly aware of AI advertising, strongly prefer AI-generated video and personalised display formats,

and respond to GenAI-personalised ads with significantly higher engagement across all measured dimensions. The Chi-Square analysis establishes that ad format preference and privacy concern are significantly associated, confirming that the nature of the ad format itself shapes the degree of privacy anxiety consumers experience. Pearson Correlation Analysis confirms strong positive relationships among all engagement dimensions, while Privacy Concern acts as the single most consistent negative moderator across all variables. Exploratory Factor Analysis provides a four-factor structural model — Engagement Quality, Privacy Concern, Format Preference, and Platform Context — collectively explaining 79.3 per cent of total variance in consumer engagement, offering a validated conceptual framework for future longitudinal and experimental research. Multiple Regression Analysis confirms that Ad Format Preference (beta = 0.38) and Personalisation Perception (beta = 0.31) are the primary positive drivers, while Privacy Concern (beta = -0.24) is the principal inhibitor of engagement. The long-term success of GenAI advertising will depend not only on its ability to deliver commercially superior engagement outcomes, but on the advertising ecosystem's capacity to earn and maintain consumer trust through transparency, data governance, and ethical AI deployment. Organisations that integrate these principles into their GenAI advertising strategy will be best positioned to realise the full commercial and relational potential of this technology in India's rapidly expanding digital marketplace.

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