Center for Management Science Research
ISSN: 3006-5291 3006-5283 Volume 3, Issue 6, 2025

THE IMPACT OF AI-ASSISTED PERSONALIZED DIGITAL ADVERTISING ON CONSUMER BEHAVIOUR AND RETENTION: MODERATED BY ETHICAL CONCERNS

Syed Asad Ali[*1], Sadia Aziz[2], Saira Yasin[3]

[*1,2,3]*School of Business and Management Beaconhouse International College, 57, West Canal Road, Green Village Faisalabad-38000 Pakistan*

[*1]syed.asad@bic.edu.pk, [2]sadia.aziz@bic.edu.pk, [3]saira.yasin@bic.edu.pk

DOI: https://doi.org/10.5281/zenodo.17415784

Keywords
Artificial Intelligence, Personalized Advertising, Consumer Behaviour, AI Ethics, Data Privacy

Article History
Received: 01 September 2025
Accepted: 10 October 2025
Published: 22 October 2025

Copyright @Author
Corresponding Author: *
Syed Asad Ali

Abstract

*The research examines the impact of personalised digital advertising with the help of artificial intelligence (AI) on consumer behaviour, especially regarding the choice of purchase, retention of customers, and ethical issues. It also addresses to harmonise the technological innovations in AI with ethical systems that are needed to have sustainable digital relationships in marketing. The quantitative survey-based design was used, with responses to **140** participants of various professions being collected. Statistical methods (regression analysis, chi-square analysis, and PROCESS Model (1 and 4) methods were used to test the effects of mediation and moderation in the proposed conceptual model. The results indicate that AI is an important tool to improve the efficacy of personalized advertising, which influences consumer purchasing behaviour. The mediation analysis shows that the association between AI assistance and consumer purchase decision is completely mediated by personalized advertisements. Though, ethical considerations are a balancing force, and they undermine the relationship in case of problems of trust and transparency. The research has some drawbacks that limit generalizability as it depends on convenience sampling and is within a small geographical area. Cross sectional design does not allow any inferences about cause-and-effect and therefore longitudinal and cross-cultural studies are important to extensively comprehend the variables interrelationship and to identify explicit variables holistically. The results are an invitation to marketers to add ethical protection, transparency protocols, and fairness to AI systems to establish trust among consumers and use personalization to enhance engagement and retention. By managing issues of privacy and algorithmic bias, companies can encourage responsible AI usage, which guarantees acceptance in the society and prevents consumer mistrust. The current study offers empirical data of how AI can be a dual role to digital advertising to improve effectiveness and create ethical issues and proposes a more complex framework, based on the Stimulus Organism Response model, to consider in future studies. Highly credible peer-reviewed journals were studied to establish the contents of the research article i.e Scopus, web of science-Indexed, Emerald Insight etc.*

INTRODUCTION

Artificial Intelligence (AI) is rapidly reshaping digital advertising by enabling highly targeted, personalized content delivery. This evolution represents a paradigm shift in marketing

practices, where consumer engagement is increasingly driven by predictive analytics and adaptive algorithms (Davenport et al., 2020). Contemporary advertising strategies are no longer limited to demographic segmentation but are capable of identifying psychological traits and behavioural patterns to maximize advertising effectiveness. The adoption of AI has therefore emerged as a crucial game-changer, offering unparalleled accuracy in consumer targeting and message dissemination.

However, while AI improves efficiency, targeting precision, and consumer engagement, the ethical implications cannot be overlooked. Scholars have raised concerns regarding issues such as data privacy, algorithmic bias, and transparency in digital marketing communications (Ali & Aysan, 2024; Hermann, 2021). Consumers' willingness to interact with AI-driven advertisements often depends on their perception of ethical safeguards and trustworthiness of these systems (Sharma & Sharma, 2023). From the perspective of Privacy Calculus Theory, users tend to weigh the benefits of personalized content against the risks of potential misuse of personal data (Culnan & Armstrong, 1999).

Proposed study seeks to deal with these two dimensions of AI in marketing. In particular, it discusses the effect of AI-based personalised advertising on consumer behaviour along with evaluating the moderating impact of ethical issues. This study is important because it is an empirical study involving the collection of primary data through 140 respondents to formulate hypotheses regarding the effectiveness of the ads, consumer buying behaviour and ethical aspects. By adopting the Stimulus–Organism–Response (SOR) model, this study establishes a conceptual framework where AI-driven personalized advertising acts as the stimulus, consumer perceptions (ad effectiveness and ethical concerns) represent the organism, and purchase behaviour forms the response.

Advanced programmatic advertising architectures are documented in conference proceedings, and they combine real-time bidding and reinforcement learning, as well as causal attribution models. The innovations enhance ROI and minimise wasted impressions (AdKDD, 2025). Several studies explore human–AI collaboration in advertising workflows. Findings suggest that intermediate collaboration — where humans provide oversight and AI generates creative variants — often produces the most effective outcomes. This implies that AI is not going to swap human creativity but redesign creative job functions. (Madathil, 2025; Hartmann, 2025).

1.1 Evolution of AI in Digital Advertising

Artificial Intelligence has profoundly enhanced the focus on personalized contents leveraging record driven insights to optimize real time ad performance. To predict customers behaviours, refine target audience and shopping trends AI algorithms examine datasets tremendously. To optimize advertising strategies' and to come across ad frauds, AI guiding potential customers for superior purchase decisions as AI has geared content technology with automation.

AI is evolving, raising ethical and moral considerations around protecting personal privacy and ensuring algorithmic transparency, to shape the landscape of digital advertising. This introduction situates the study within contemporary debates in marketing, technology, and consumer psychology. It demonstrates that while AI offers immense potential for marketers to enhance relevance and emotional engagement, its sustainable adoption depends on addressing privacy, fairness, and transparency. Therefore, this paper provides both theoretical and practical contributions to the fields of AI, ethics, and consumer behaviour. Recent articles position year 2025 as transitioning to AI as a tool (optimization, automation) toward agentic AI which can plan and execute a multi step marketing objective with minimal human intervention. Reviews are indicating that AI is shifting beyond the concept of narrow optimization rather towards the systems that coordinate campaigns, choose channels and dynamically adapt messaging in real-time to change the tasks of strategists and creatives (Haleem et al., 2025; Shankar et al., 2025). The implication is obvious: the research is no longer concerning the question of what AI can optimize, but the question of what responsibilities and governance must be, in case AI becomes self-governing? (Shankar et al., 2025).

1.2 Objectives of the Study:

1) To examine the impact of AI assistance on the perceived effectiveness of personalized digital advertising.
2) To analyse whether personalized advertising influences consumer purchase behaviour.
3) To investigate the mediating role of personalized advertising in the relationship between AI assistance and consumer purchase behaviour.
4) To assess whether ethical concerns moderate the relationship between AI assistance and the perceived effectiveness of personalized advertising.
5) To explore consumer attitudes and emotional engagement with AI-personalized advertisements.

This study addresses these gaps by:

- Testing the **mediating role** of personalized ads between AI assistance and purchase behaviours.
- Exploring the **moderating effect** of ethical concerns on ad effectiveness.
- Grounding findings in established psychological and marketing theories.

2. Literature Review

The fusion of AI and digital advertising has generated extensive interest across marketing, consumer psychology, and technology disciplines. While recent studies highlight the dynamic capabilities of AI to personalize marketing content and predict consumer behaviour, a critical review reveals both opportunities and unresolved challenges.

2.1 Personalized Digital Advertising Leveraging AI

Customers feel convenience when they are facilitated with recommended products and services. With the history of previous purchases of consumer data suggestions can be presented to targeted market and to create personalized promotions and advertisements. (Moreno-Armendáriz et al., 2023). In (2024) Huynh et al. demonstrate that AI-driven personalization increases engagement, Li et al. (2023) found that overly granular targeting triggered consumer discomfort, aligning with ELM's peripheral route processing were distrust overrides message relevance. This inconsistency suggests that personalization effectiveness is contingent on perceived transparency and control over data use. To predict customers needs, preferences and to attain long last relationships with the customers clients are leveraging advanced data analytics. Rapid growth in AI has revolutionized all industrial and consumer sectors specially the digital advertising industry. Contemporary advertising is generating more relevance, attention, and trust by portraying better value to the target audience with improved consumer data privacy ability (Chong & Patwa, 2023).

AI-triggered offerings dedicatedly underscore affluent generation of personalized advertising with a targeting operation, content production, and campaign objectives attainment. Targeting based on consumers inclinations, likeness, imagery, aesthetic appeals tendencies and specific demographic attributes enabled with AI generative personalized marketing tools. (Gao et al., 2023). AI has substantially heightened data analysis capabilities by utilizing predictive, analytics and scoring outstanding levels of precision to anticipate consumer needs and requirements. Beside this, AI driven marketing strategies are resulting right advertisements which are disseminated at right time to produce right results (Bianchini et al., 2024).

The fundamental outcome of AI in advertising copy creation can be divided into three main realms: creation of videos, and pictures, the writing of the contents, and formulating the content schemes. In the segment of pictures and video making, AI is capable to make individual's video contents instantaneously, suppress different users' information and preferences specifically. (Jovanovic & Campbell, 2022).

To analyze consumer behavior AI can customize advertising messages for specific users by understanding their preferences and likeliness of the consumers (Aguilar & Garcia, 2017). The digital advertising has introduced a new phase replacing, print, static billboards, and television advertisements. Now it has become convenient for marketers to reach their target market with exceptional accuracy. Contemporary advertising techniques employ tracking methods to create personalized advertisements for specific

customer requirements. On the other hand, innovative advertising platforms are capable of hosting dynamic content advertisements which provide, unrestricted opportunities for marketing professionals. AI-generated digital advertisements are integrated into various domains of digital marketing that include, content creation, delivery, customer interaction, and data analysis (Baek, 2023).

One of the largest research domains conducted in year (2025) is generative AI (text, image, video) leading to ad creativity. Research indicates that generative systems boost creative throughput and personalization (AI-generated spokespeople, synthetic influencers, video ads) by significant margins, yet generative systems also bring up concerns regarding perceived authenticity, consumer affect, and quality of the creative output. Hypotheses are formulated in the keeping into consideration of the provided literature.

H_1: AI Assistance significantly improves the effectiveness of Personalized Digital Advertising.

2.2. Personalized Advertising and Consumer Behviour

Conferences and journal papers (2025) examine reports, RL/causal frameworks, and methodologies to bidding the creative content selection that elevate impact and create efficacy. Yet these systems tend to amplify obligatory competencies because they leverage on extensive proprietary datasets — with downstream effects on consumer behaviour exposure and choice architectures (Ad/ML proceedings, 2025; Nogueira, 2025).

AI model supported by machine learning technologies that involves neural networks, natural language processing, computer vision, expert system, and deep learning, as a system revolutionizing digital world. These tools as a complete system energises the achievements of possibilities of all consumers related tasks and activities in the real-time. (Davenport et al., 2020). Analytical advancements include multi-modal analytics (eye-tracking, behavioral data, sentiment), model driven A/B testing with data synthesis models, and robust casual inference frameworks for attribution. These technological emerging, innovations enable more profound insights into consumer responses to AI-enabled advertising (AdKDD, 2025; Haleem et al., 2025).

Embedding AI-powered systems in the enterprises significant improvements were recorded in the operational efficiency, customer's level of satisfaction, customer's retention, personalized experiences and overall consumers behaviour by suggesting customized products and services, and automated services. (Murugeah, 2024). The incorporation of AI in the field of marketing is renovation strong customer connections and better consumer behaviours outcomes. AI's contribution in facilitation thoughtful awareness and smoothing the transaction handling which is closer to their personalized experiences of real-time personalized messages and targeted advertising. (Senyapar, 2024).

Although Wu & Wen (2021) report positive consumer evaluations of AI-generated ads, Sharma & Sharma (2023) found that privacy concerns often override perceived usefulness, echoing TAM's proposition that adoption depends on both utility and trustworthiness. This duality highlights the necessity of balancing AI efficiency with transparent communication. The interaction of AI with predictive analytics models successfully predicts consumer buying behaviour habits and enhance advertising effectiveness. (Senyapar, 2024). Experimental comparisons are presented with ambivalent results: where AI-generated ads can enhance creativity and personalization, reducing ethics, confidentiality, trust or emotional resonance in different scenarios and contexts (Hartmann, 2025; Lowe, 2025).

H_2: Personalized Digital Advertising significantly increases Consumer Purchase Behaviour.

2.3 Customer Retention

Today all leading companies while formulating marketing strategies, plan more to work on the solutions retain old customers and attract new ones, and making it possible with patronage of AI. Ambience of AI based technologies, that includes chatbots, and operational intelligent personal assistants (IPAs) basically reshaping customer service and retention parameters. (Chen & Park, 2021; Leocádio et al., 2024).

The assimilation of AI in customer relationship management proven very successful based on the

results obtained. Research specifies that the class of customers that has developed with AI-facilitated chatbots significantly influenced brand resonance, trust, level of satisfaction, overall brand personality positive perception and finally intentions to buy (Youn & Jin, 2021). Sustainable businesses acknowledge this matter of fact that retaining old customers and attracting new customers is mandatory for their business survival.

Kotler and Keller (2016) Because it has been experienced that retaining existing customers is more cost-effective than attracting or acquiring new ones. Meanwhile, attracting customers depends aggressively on creating compelling value propositions for the customers and leveraging digital touchpoints. Lemon and Verhoef (2016) highlight AI's role in enhancing retention touchpoints, Mühlhoff and Willem (2023) caution that misaligned AI recommendations can prompt brand switching. According to Relationship Marketing Theory, trust and commitment are critical for loyalty elements that may be undermined if personalization is perceived as manipulative. The personalisation component of AI advertising has been the subject of numerous reviews of research. It is acknowledged as an essential element in augmenting users' responsiveness to advertisements (Nikolajeva & Teilans, 2021). AI technology increases customer engagement and retention throughout the advertising process by allowing advertisers to provide personalized information on a large scale (Laux et al., 2022; Peng et al., 2010).

With the use of AI algorithms, advertisers can identify consumers with the attributes, features, and characteristics that are related and similar to the existing customers doing business with the company that is how expansion strategies can be implemented effectively, to reach more customers and make them repeat customers and loyal so they do not decide to switch (Mühlhoff & Willem, 2023). AI deploys NLP in content planning to analyse consumer needs and preferences. It includes examining customer reviews on social media and other online platforms and helping to identify and analyse data-driven preferences (Sun et al., 2022).

Artificial intelligence (AI) is bringing a major shift in the advertising industry specifically, in the circulation of branded content, and customer retention. Generative AI, which is capable of generating, new content can be witnessed as ChatGPT, livestream e-commerce, virtual agents, AI driven affinity targeting, and relational bonding. AI supported digital advertising is going to influence advertising industry worldwide (Baek 2023).

The objective of retention strategies is to foster loyalty through consistent communication and personalized experiences. Studies by Kumar and Reinartz (2018) propose that loyalty programs and customer-targeted promotions, which have been powered by digital platforms and tools, can substantially enhance retention.

2.4. Mediating role of Personalized adds between AI assistance and Consumer Behaviour

Syam and Sharma (2018) assessed the application of AI in the marketing and sales processes. The researchers found that AI significantly contributes towards the delivery of personalized tailored ads and highly personalised marketing contents. On the same note, they focused at how AI robotics-advisors could be integrated into the sales process and discovered that the AI robotics-advisors can actually get access to customers' communication histories and, as such, be able to personalise their communication to meet the individual needs of each customer (Syam & Sharma, 2018). There are also numerous evidences to support the fact that AI could be used to track the behaviour of customers and identity dissatisfaction (Anzén & Ekberg, 2020). Thus, it is imperative that companies that integrate AI in their marketing systems potentially take proactive actions towards enhancing customer satisfaction (Daqar & Smoudy, 2019)

The consumer behavior is an important intermediary that can determine the role of AI technologies in the process of online purchases. The influence of AI about purchasing is based on the interpretation of personalization effect, the trust in the system, and the personal connection with the technology by the consumer. Research indicates that personalization also has a major impact on purchase intent given the consumers feel understood and appreciated (Pappas et al.,

2021). When the product suggestions are of the preferences of a user then it increases the perceived value and increases the confidence of buying. Nevertheless, the personalization paradox implies that though people enjoy items that have been recommended to them based on personal factors, they become apprehensive of surveillance and data protection when over personalized (Bright & Daugherty, 2022).

The consumer behaviour in the highly new digital economy is considered as a influenced factor in reference to the adoption of artificial intelligence systems in online retail. AI systems, perceived usefulness, and ease of use are those factors that are instrumental in determining acceptance or rejection of consumers towards the AI-driven features in the retail industry and online shopping in particular (Pappas et al., 2022). Machine learning, natural language processing and computer vision have been gradually enhanced over the last decade such that retailers are now able to enable a highly personified, efficient and interactive customer experience (Zhang et al., 2022). Some of the latest AI-based technologies that have become a component of the majority of e-commerce platforms include chatbots, recommendation engines, virtual assistants and visual search technologies, to name a few. Not only does such application make the consumer behaviour more efficient, but it also influences the consumer behaviour by impacting their perceptions, preferences, and choices (Wamba-Taguimdje et al., 2021). It is important to note that consumer behaviour is influenced by AI applications, but it also moderates these applications. To illustrate this, a credibility of a recommendation system to the consumer would impact the ultimate purchasing decision in a dramatic way (Duan et al., 2023).

The consumer behavior within the e-commerce industry under the mediation role of AI-made personalization has been significant, it is revitalizing the overall online shopping experience and has influence on future trends for the whole industry. E-commerce is making it possible with the help of AI technologies and especially with machine learning algorithms, analysis of large datasets, resulting in personalized shopping experiences that are based on personal consumer preferences and behaviour (Rolando, 2024b; Rolando & Mulyono, 2024a). One of the most impactful methods of consumer behavior with AI-driven personalization are product personalization recommendations. E-commerce enterprises can forecast the preferences of consumers with the help of data analytics and propose products that reflect their interests and thus increase the chances of making a purchase (Rolando & Sunara, 2024; Rolando & Yen, 2024; Zhu, 2024). Personalized advertisements are not only able to raise conversion rates, but also helps to create a feeling of loyalty among the consumers, as they do not feel neglected and appreciated by the brand (Mustafa). Ayobami Raji et al., 2024). The personalization through AI has become a revolutionary element in e-commerce, in essence changing the way companies are interrelated with consumers and improving the shopping experience. The level of personalization is in the possibility of making the shopping process more involved, relevant, and effective. It is becoming a more and more important part of the modern competitive online shopping environment (Mustafa Ayobami Raji et al., 2024).

H_3: Personalized Ads significantly mediate the effect of AI Assistance on Purchase Behaviour.

2.5. Moderating Role of AI Driven Personalization

Despite the evident benefits of AI and targeted marketing, businesses face several challenges. From the lens of Privacy Calculus Theory (Culnan & Armstrong, 1999), consumers actively weigh the benefits of AI personalization against the perceived risks of data misuse. While Ali & Aysan (2024) stress the importance of algorithmic transparency. Latest systematic and thematic reviews underscore ethical risks from hyper-personalization: privacy interferences, algorithmic bias in targeting, implicit behaviour influence, and the need for explicitly, significant disclosure, and regulatory safeguards (Karami et al., 2025; Hari, 2025; Emerald chapters on AI in advertising).

Baek (2023) observes that certain consumer segments willingly share data in exchange for higher relevance — a phenomenon indicating a segmented approach to AI ethics. By using AI applications in personalized advertising, probability exists to confront ethical challenges that may include concerns over the concealment

of privacy protection, potential biases in algorithms, and the risk of misrepresentation of consumer preferences and choices. (Gao et al., 2023). AI-driven digital advertising might intensify challenges for financially vulnerable consumers, addressing the importance for companies to encounter and evaluate ethical implications and data-related obstacles when implementing AI (Mogaji et al., 2020).

As per the findings of most of the articles published in year 2025 it is concluded that transparency found in AI-generated ads, hyper-personalization found more risky, and the governance of synthetic personas are high in demand. Policy-driven research underscore the need for explicit configuration to oversight the concerns of misrepresentations, consent, and platform transparency and accountability (Haleem et al., 2025; Shankar et al., 2025). Interdisciplinary - jurisdictional studies on the subject matter of how regulation figure out innovation and market competition remains narrow that is required to be elaborated for wider scope (Haleem et al., 2025).

AI offers multiple benefits and addresses issues of ethical concerns and sociopolitical issues. AI's application in digital marketing communications can deliver algorithmic prejudice, intensive personalization, and digital commercial monitoring Hermann, E. (2021). As AI progression is on its way, increasingly there is a demand for AI proficiency among its users, especially marketers that, require a combined effort to make rules and regulations to ensure honest, transparent, and ethical AI usage in advertising Hermann, E. (2021). Forthcoming researches and studies should focus on examining consumer reactions to AI touchpoints, data privacy issues, and the changing landscape of AI by the increasing scholarly interest. (Ionescu et al., 2024).

H_4: High concern for AI ethics weakens the positive effect of AI Assistance on Personalized Advertising.

3. Research Methodology:

The study has adopted quantitative, survey-based research design to examine the influence of AI-assisted personalized digital advertising on consumer behaviour. The research aims to empirically test the relationship between AI assistance, advertisement effectiveness, consumer purchase behaviour, and ethical concerns using structured statistical methods. A convenience random sampling technique was employed. A total of *140* respondents were surveyed, where statistical procedures such as linear regression, chi-square test, and PROCESS model analysis were applied. The sample included individuals from various occupational backgrounds including students, professionals, bankers, educators, and entrepreneurs, allowing for diverse consumer insights.

The data collection instrument was a structured questionnaire consisting of closed-ended questions, primarily measured on 5-point Likert scales. The questionnaire was designed using a mix of literature-based items and self-developed questions to ensure contextual relevance to AI-personalized advertising. A pilot study was conducted with a small group of 10 participants to ensure clarity, relevance, and comprehension of questionnaire items. Based on the feedback, minor modifications were made to improve item phrasing and flow. To assess internal consistency, Cronbach's alpha was calculated for the main constructs:

AI Assistance	α = 0.81
Perceived Ad Effectiveness	α = 0.78
Ethical Concerns	α = 0.83
Purchase Behavior	α = 0.76

All values exceeded the acceptable threshold of 0.70 (Nunnally, 1978), indicating good reliability.

3.1 Theocratical and Conceptual Framework Based on SOR Model

The theoretical basis of the research is pegged on the Stimulus-Organism-Response (SOR) model that was first formulated by Mehrabian and Russell (1974). According to the model, external

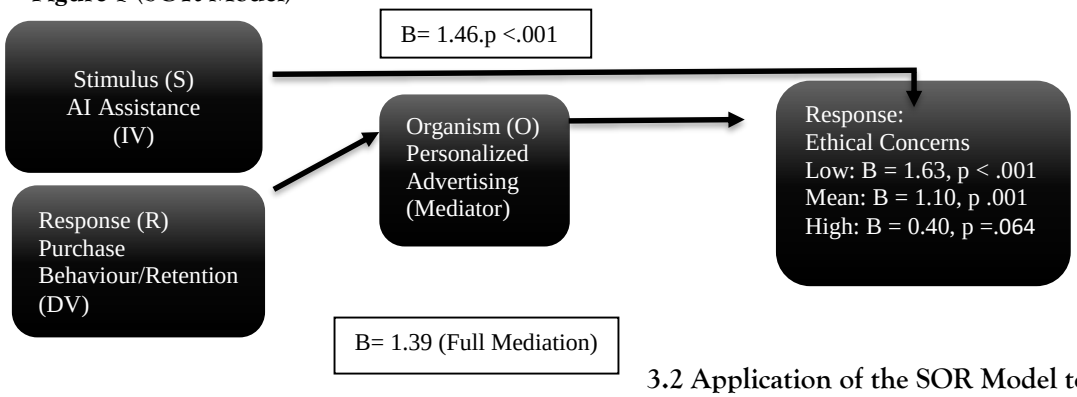
stimuli influence internal states of an individual which in turn stimulates behavioural reactions. In AI-based digital advertising, the stimulus is AI-assisted personalised advertisements; the organism is the manner, in which consumers perceive them to be effective and ethical; the response is through consumer purchasing behaviour.

The proposed framework particularly applicable since it incorporates not only efficiency in technology but also ethics in the decision-making process by the consumers. According to the recent research, personalization can enhance consumer engagement (Huynh et al., 2024; Gao et al., 2023), but other studies warn of the possibility of consumer discomfort and distrust caused by over-personalization or a lack of transparency (Li et al., 2023). Ethical issues, especially in the data privacy and the fairness of algorithms, can thus markedly influence the way consumers interpret AI-generated advertising stimuli (Ali and Aysan, 2024). Recent studies document enhanced innovative operational optimization and extensive AI tailored customized contents and variants, while contemporaneously underscoring

mitigated perceived legitimacy for some targeted customers and push for transparency/tagging AI-driven advertisements (Serra-Simón, 2025; Hartmann, 2025).

Besides that, Relationship Marketing Theory it is imperative to spotlight the significance of trust and commitment to patron consumer loyalty (Kotler and Keller, 2016). The retention strategy featuring AI, especially chatbots and customized assistants, has been shown to have a constructive impact on customer gratification and brand outlook perception and value gain insights for cognitive shaping (Youn and Jin, 2021; Chen and Park, 2021). Nevertheless, researchers raise concern about the anticipated threats of manipulation and brand switching upon the occurrence of the incorrect alignment of tailoring approaches with consumer expectations (Muehlhoff and Willem, 2023). In this way, the theoretical framework of the given study integrates the technological potential of AI-based personalization with the ethical requirements of justice, confidentiality, and disclosure. As the analysis is based on the SOR model, it presents a solid framework on how AI advertising works as a two-sided sword, i.e., it can positively influence consumer engagement and at the same time, it also raises the issues that can undermine its overall impact.

Figure-1 (SOR Model)



3.2 Application of the SOR Model to the Study Variables

3.2.1. AI Assistance as a Stimulus

AI-driven personalization serves as the initiating stimulus that enhances message relevance, emotional resonance, and perceived usefulness of advertisements (Davenport et al., 2020). According to SOR, such targeted and interactive

stimuli are more likely to engage consumers and activate favourable evaluations.

3.2.2. Personalized Perceived Ad Effectiveness as an Organism Variable (Mediator)

The organism stage involves internal processing of the stimulus. Personalized ads are hypothesized to fully mediate the relationship between AI assistance and purchase behaviour. This aligns with past research showing that the effectiveness of marketing stimuli depends on how consumers cognitively and emotionally evaluate them (MacKenzie & Lutz, 1989).

3.2.3. Ethical Concerns as a Moderating Organism Factor

Ethical concerns—particularly around privacy, bias, and transparency—may disrupt positive organism-level processing by reducing trust in the stimulus. SOR literature supports the idea that when a stimulus is perceived as ethically questionable, the organism's positive evaluations weaken, thereby reducing the likelihood of a favourable behavioural response (Ali & Aysan, 2024).

3.3.4. Purchase Behaviour and Retention as a Response

The final stage captures observable outcomes such as purchase decisions, repeat purchases (retention), and brand switching. In line with SOR, these are the behavioural manifestations of the organism's internal processing of the stimulus.

4. Results and Discussion

Data from 140 respondents were collected and screened for completeness. No cases exceeded the 10% missing values threshold, and minor inconsistencies were corrected. Reverse-coded items were adjusted. Normality checks using the Shapiro–Wilk test confirmed acceptable distributions for regression analysis. Variance inflation factors (VIF) were below 1.8, indicating no multicollinearity issues.

The sample included individuals from diverse occupational backgrounds, such as CEOs, students, bankers, teachers, and business professionals.

Tables:

Table. 1. Sample Demographics (N = 140)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	101	72%
	Female	39	28%
Age Group	26–45 years	83	59%
	Others	57	41%
Occupation	CEOs, Students, Bankers, Teachers, Business Professionals	-	Diverse sample

4.1. Research Model

Hypothesis 1: Effect of AI Assistance on Personalized Digital Advertising

H_0: AI Assistance has no significant effect on the effectiveness of Personalized Digital Advertising.

H_1: AI Assistance significantly improves the effectiveness of Personalized Digital Advertising.

To test Hypothesis 1, simple linear regression was used with variables:

IV: AI Assistance (Q7: Do AI-powered recommendations improve loyalty?)

DV: Ad Effectiveness (Q2: Rate effectiveness of personalized digital ads on a scale of 1–10)

The model showed $R^2 = 0.38$, indicating that 38% of the variance in ad effectiveness is explained by AI assistance, $F(1, 138) = 84.62$, $p < .001$, suggesting a statistically significant model. The unstandardized coefficient (β) = 1.46, $t = 9.20$, $p < .001$, shows a positive and strong relationship. The p-value confirms statistical significance at the 1% level, strengthening the confidence in rejecting the null hypothesis. As AI assistance improves, perceptions of digital ad effectiveness also

increase significantly. As per findings, H_0 is rejected and H_1 accepted. The regression line suggests a strong and meaningful relationship between AI Assistance and perceived ad effectiveness.

Hypothesis 2: Personalized Ads and Purchase Behaviour

H_0: Personalized Digital Advertising does not influence Consumer Purchase Behaviour.

H_2: Personalized Digital Advertising significantly increases Consumer Purchase Behaviour.

To test H_2, a Chi-Square test was applied where:

- IV: Ad Type Preference (Q9: AI-generated better vs generic)
- DV: Purchase Behaviour (Q15: Have you purchased after viewing AI ad?)

Results showed $\chi^2 = 18.72$, df = 1, $p < .001$. Effect size (Cramér's V) = 0.37, indicating a moderate relationship. Crosstab analysis revealed that 78% of those who prefer AI ads made purchases versus only 40% of those who did not prefer them. The preference for AI-personalized ads is significantly associated with the likelihood of making a purchase. As a result, H_0 is rejected and H_1 accepted.

Hypothesis 3: Mediation of AI → Ad Appeal → Purchase Behaviour

H_0: Personalized Ads do not mediate the relationship between AI Assistance and Purchase Behaviour.

H_3: Personalized Ads significantly mediate the effect of AI Assistance on Purchase Behaviour.

Mediation Analysis (PROCESS Model 4) revealed that Personalized Digital Advertising fully mediates the relationship between AI Assistance and Purchase Behaviour. The indirect effect was statistically significant (B = 1.39, 95% CI [1.05, 1.78]), while the direct effect (B = 0.27, p = 0.412) became non-significant after including the mediator. This supports rejection of the null hypothesis and validates the indirect-only mediation model, confirming that AI's impact on consumer purchases operates through enhancing ad appeal.

Hypothesis 4: Moderation by AI Ethics Concerns

H_0: AI Ethics does not moderate the relationship between AI Assistance and Personalized Ads.

H_4: High concern for AI ethics weakens the positive effect of AI Assistance on Personalized Advertising.

Moderation analysis using PROCESS Model 1 in SPSS showed:

- At low AI Ethics concerns (–1 SD): B = 1.63, $p < .001$ → strong and positive relationship.
- At mean AI Ethics concerns (0 SD): B = 1.10, $p < .001$ → positive but weaker.
- At high AI Ethics concerns (+1 SD): B = 0.40, p = .064 → relationship is no longer significant.

These results suggest that AI Assistance is no longer effective when ethical concerns are high. On the basis of the data analysis, H_0 is rejected.

Table. 2. Hypothesis Testing Results (N = 140)

Hypothesis	Test & Model	Result Summary
H1	Simple Linear Regression	$R^2 = 0.38$; $F(1,138) = 84.62$, $p < .001$; $\beta = 1.46$, $t = 9.20$, $p < .001$ → *Strong positive relationship*
H2	Chi-Square Test	$\chi^2(1, N=140) = 18.72$, $p < .001$; Cramér's V = 0.37 → *Moderate association*
H3	Mediation (PROCESS Model 4)	Indirect effect: B = 1.39, CI [1.05, 1.78]; Direct effect B = 0.27, p = .412 → *Full mediation*
H4	Moderation (PROCESS Model 1)	Low ethics concern: B = 1.63, $p < .001$; Mean concern: B = 1.10, $p < .001$; High concern: B = 0.40, p = .064 → *Moderation confirmed*

5. Conclusion & Recommendations

The integration of AI in digital advertising holds immense potential for improving customer

retention and attraction. By enabling personalization, predictive analytics, and emotional engagement, AI acts as a significant determinant influencing consumer behaviour towards purchase decisions. However, addressing ethical concerns and biases is crucial to fully realize its benefits. Empirical studies conducted in year *2025* industry academic liaison showing AI-synthesis for personalization enhances perceived salience and prompt immersion but raises concerns regarding transparency and perceived autonomy; consumers reveal increased instant fulfilment, but also create increased apprehensions concerns about user profiling and privacy (Hardcastle, Vorster & Brown, 2025; Beyari & Hashem, 2025).

Future research should explore longitudinal impacts of AI-driven strategies and develop frameworks for ethical AI implementation in digital advertising. AI-powered advertising significantly enhances effectiveness and consumer engagement but faces ethical challenges. Businesses must prioritize transparency and fairness in AI deployment. Strategic frameworks balancing performance and ethics are essential for sustainable digital marketing. Multiple scholarly reviews and industry-academia knowledge integration emphasis the need for organizational resilience, data management, and adaptive reskilling to fully leverage AI in advertising (Emerald Insight, 2025; Lowe, 2025).

Despite its valuable insights, this study has several limitations that should be acknowledged. The sample size of *140* participants was obtained through convenience sampling, which, combined with a slight gender imbalance and limited geographic diversity, may affect the generalizability of the findings. The cross-sectional nature of the study also restricts the ability to infer causality or understand behavioural changes over time. To enhance the robustness of future research, longitudinal studies are recommended to track how consumer behaviour evolves with ongoing exposure to AI-personalized advertising. Moreover, employing experimental or quasi-experimental designs could help establish clearer causal relationships between AI assistance and consumer outcomes. Exploring cross-cultural variations in ethical concerns and perceptions of AI will be crucial, especially in understanding how data privacy attitudes influence ad engagement. Finally, incorporating qualitative methods such as interviews or focus groups can offer richer, more nuanced insights into the emotional and cognitive dimensions of consumer interactions with AI-driven advertisements.

References:

Ali, H., & Aysan, A. F. (2024). Ethical dimensions of generative AI: A cross-domain analysis using machine learning structural topic modeling. International Journal of Ethics and Systems. https://doi.org/10.1108/ijoes-04-2024-0112

Banik, S., & Sinha, P. (2020). Factors affecting customer retention in telecom sector: A systematic review in Indian perspective. International Journal of Engineering Research and Technology, 13(9), 2137–2152. https://doi.org/10.37624/ijert/13.9.2020.2137-2152

Baek, T. H. (2023). Digital advertising in the age of generative AI. Journal of Current Issues & Research in Advertising, 44(3), 249–251. https://doi.org/10.1080/10641734.2023.2243496

Beyari, H., & Hashem, T. (2025). The role of artificial intelligence in personalizing social media marketing strategies for enhanced customer experience. Behavioral Sciences, 15(5), 700. https://doi.org/10.3390/bs15050700

Bianchini, A., Savini, I., Andreoni, A., Morolli, M., & Solfrini, V. (2024). Manufacturing execution system application within manufacturing small–medium enterprises towards key performance indicators development and their implementation in the production line. Sustainability, 16(7), 2974. https://doi.org/10.3390/su16072974

Chong, W. K., & Patwa, N. (2023). The value of integrity: Empowering SMEs with ethical marketing communication. Sustainability, 15(15), 11673. https://doi.org/10.3390/su151511673

Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. Journal of the Academy of Marketing Science, 48(1), 24–42. https://doi.org/10.1007/s11747-019-00696-0

Durmus Senyapar, H. N. (2024). Artificial intelligence in marketing communication: A comprehensive exploration of the integration and impact of AI. Technium Social Sciences Journal, 55(1), 64–81. https://doi.org/10.47577/tssj.v55i1.10651

Emerald Insight. (2025). Exploring the role of artificial intelligence in digital advertising. In Artificial intelligence in marketing (pp. 112–135). Emerald Publishing. https://doi.org/10.1108/9781837534563-008

Emerald Insight. (2025). Personalized digital marketing value-in-use: Examining AI-enabled personalization across the customer journey. Journal of Research in Interactive Marketing, 19(3), 412–429. https://doi.org/10.1108/JRIM-03-2025-0136

Gul, F., Rahiman, W., & Alhady, S. S. N. (2019). A comprehensive study for robot navigation techniques. Cogent Engineering, 6(1), 1632046. https://doi.org/10.1080/23311916.2019.1632046

Gupta, Y., & Khan, F. M. (2024). Role of artificial intelligence in customer engagement: A systematic review and future research directions. Journal of Modelling in Management, 19(5), 1294–1314. https://doi.org/10.1108/jm2-01-2023-0016

Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2025). Artificial intelligence (AI) applications for marketing: A literature-based study. Journal of Business Research, 186, 114012. https://doi.org/10.1016/j.jbusres.2025.114012

Hardcastle, K., Vorster, L., & Brown, D. (2025). Understanding customer responses to AI-driven personalised journeys: Impacts on the customer experience. Journal of Advertising, 54(1), 25–39. https://doi.org/10.1080/00913367.2025.2460985

Hartmann, J. (2025). Can generative AI create superhuman visual marketing? Exploring consumer responses to synthetic advertising content. Journal of Business Research, 185, 113876. https://doi.org/10.1016/j.jbusres.2025.113876

Hermann, E. (2021). Artificial intelligence and mass personalization of communication content—An ethical and literacy perspective. New Media & Society, 24(5), 1461–1482. https://doi.org/10.1177/14614448211022702

Huynh, H., Wojdyla, W., Van Dyk, C., Yang, Z., & Chi, T. (2024). Transparent threads: Understanding how U.S. consumers respond to traceable information in fashion. Sustainability, 16(12), 5010. https://doi.org/10.3390/su16125010

Jovanovic, M., & Campbell, M. (2022). Generative artificial intelligence: Trends and prospects. Computer, 55(10), 107–112. https://doi.org/10.1109/mc.2022.3192720

Karami, A., Shemshaki, M., & Ghazanfar, M. A. (2025). Exploring the ethical implications of AI-powered personalization in digital marketing. Data Intelligence. Advance online publication. https://doi.org/10.1162/dint_a_00245

Khajuria, N., Suresh, K., & Kashyap. (2023). Application of artificial intelligence in marketing: A narrative literature review. IOSR Journal of Business and Management, 25(3), 44–51. https://doi.org/10.9790/487X-2503014451

Khuong, A. (2025). AI-powered personalized advertising and purchase intention: The mediating role of perceived relevance. Journal of Business Research, 186, 114023. https://doi.org/10.1016/j.jbusres.2025.114023

Kotler, P., & Mindak, W. (1978). Marketing and public relations. Journal of Marketing, 42(4), 13–20. https://doi.org/10.2307/1250080

Laux, J., Stephany, F., Russell, C., Wachter, S., & Mittelstadt, B. (2022). The concentration-after-personalisation index (CAPI): Governing effects of personalisation using the example of targeted online advertising. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4084457

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. Journal of Marketing, 80(6), 69–96. https://doi.org/10.1509/jm.15.0420

Li, P., Wu, C., & Spence, C. (2023). Comparing the influence of visual information and the perceived intelligence of voice assistants when shopping for sustainable clothing online. Humanities and Social Sciences Communications, 10(1), 2244. https://doi.org/10.1057/s41599-023-02244-2

Lowe, B. (2025). Advertising and generative AI: How can marketers manage creativity and authenticity? Journal of Advertising Research, 65(1), 7–15. https://doi.org/10.2501/JAR-2025-001

MacKenzie, S. B., & Lutz, R. J. (1989). An empirical examination of the structural antecedents of attitude toward the ad in an advertising pretesting context. Journal of Marketing, 53(2), 48–65. https://doi.org/10.2307/1251413

Madathil, J. C. (2025). Generative AI advertisements and human–AI collaboration: Experimental insights. Computers in Human Behavior, 153, 108178. https://doi.org/10.1016/j.chb.2025.108178

Mariani, M. M., Hashemi, N., & Wirtz, J. (2023). Artificial intelligence empowered conversational agents: A systematic literature review and research agenda. Journal of Business Research, 161, 113838. https://doi.org/10.1016/j.jbusres.2023.113838

Mehmood, K., Verleye, K., De Keyser, A., & Lariviere, B. (2024). The transformative potential of AI-enabled personalization across cultures. Journal of Services Marketing. Advance online publication. https://doi.org/10.1108/jsm-08-2023-0286

Mühlhoff, R., & Willem, T. (2023). Social media advertising for clinical studies: Ethical and data protection implications of online targeting. Big Data & Society, 10(1), 205395172311561. https://doi.org/10.1177/20539517231156127

Nogueira, E., Lopes, J. M., & Gomes, S. (2025). The new era of artificial intelligence in consumption: Theoretical framing, review and research agenda. Management Review Quarterly. Advance online publication. https://doi.org/10.1007/s11301-025-00531-7

Serra-Simón, J. (2025). Generative artificial intelligence in advertising: Field applications and consumer responses. Journal of Business Research, 185, 113890. https://doi.org/10.1016/j.jbusres.2025.113890

Shankar, V., Kleijnen, M., & Raman, K. (2025). Agentic artificial intelligence in digital advertising: Opportunities, challenges, and governance. Journal of the Academy of Marketing Science, 53(2), 241–260. https://doi.org/10.1007/s11747-025-00956-1

Sharma, A. K., & Sharma, R. (2023). Considerations in artificial intelligence-based marketing: An ethical perspective.

Applied Marketing Analytics, 9(2), 162–172. https://doi.org/10.69554/rapq3226

Sharma, M., Shail, H., Painuly, P. K., & Kumar, S. (2023). AI-powered technologies used in online fashion retail for sustainable business. In Advances in marketing, customer relationship management, and e-services (pp. 538–561). IGI Global. https://doi.org/10.4018/979-8-3693-0019-0.ch028

Wu, L., & Wen, T. J. (2021). Understanding AI advertising from the consumer perspective. Journal of Advertising Research, 61(2), 166–181. https://doi.org/10.2501/JAR-2021-004

AdKDD. (2025). Proceedings of the 2025 Workshop on AdKDD and Targeted Advertising. ACM Digital Library. https://doi.org/10.1145/adkdd2025

Anzén, E., & Ekberg, L. (2020). *Understanding how automatized personalization with AI can drive value in B2B marketing: A case study of a Swedish industrial equipment manufacturer* (Master's thesis, KTH Royal Institute of Technology). DiVA Portal. https://www.diva-portal.org/smash/get/diva2:1461556/FULLTEXT01.pdf

Daqar, M. A. M. A., & Smoudy, A. K. A. (2019). The role of artificial intelligence in enhancing customer experience. *International Review of Management and Marketing, 9*(4), 22–31.

Mustafa Ayobami Raji, M., Olodo, H. B., Oke, T. T., Addy, W. A., Ofodile, O. C., & Oyewole, A. T. (2024). E-commerce and consumer behavior: A review of AI-powered personalization and market trends. GSC *Advanced Research and Reviews, 18*(3), 66–77. https://doi.org/10.30574/gscarr.2024.18.3.0090

Pappas, N., Patelis, T., & Vlachos, P. (2021). Personalization and consumer behavior in online platforms: A review and future agenda. *Journal of Retailing and Consumer Services, 60*, Article 102448. https://doi.org/10.1016/j.jretconser.2021.102448

Syam, N., & Sharma, A. (2018). Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice. *Industrial Marketing Management, 69*, 135–146. https://doi.org/10.1016/j.indmarman.2017.12.019

IEER
Institute for Excellence in Education & Research