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ASSESSMENT OF THE EFFICACY OF ARTIFICIAL INTELLIGENCE-GENERATED VERSUS HUMAN-GENERATED IMAGES IN DIGITAL ADVERTISING

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Abstract

In the growing field of online advertising, visual content selection is of great relevance since it directly affects the capacity to draw user attention and induce interaction. The development of artificial intelligence (AI) technology has resulted in the increasing use of AI-generated images for ads together with traditional human-generated images. This paper aims to assess, in the framework of online advertising, especially on Google Ads, the efficiency of AI-generated images against human-generated ones. This study investigates the impact of both picture forms by means of variable analysis including click-through rates (CTR), conversion rates, and user interaction. Content data analysis and in-depth interviews form a qualitative method used to examine user preferences and impressions. According to research, human-generated visuals have more emotional effect and authenticity even if artificial intelligence-generated graphics have the freedom to be scaled and customised. The current work investigates the ethical consequences connected to AI-generated images and offers reasonable advice for advertisers.

Key words : AI-generated images, human-generated images, online advertising, user engagement, click-through rates, visual content effectiveness, advertising ethics.

Introduction

In the digital era, internet advertising has become a crucial component of marketing strategy, as organisations increasingly rely on platforms like Google Ads to effectively engage their target audience. Visual material, whether generated by artificial intelligence or humans, plays a vital role in capturing attention and influencing consumer behaviour (Smith, 2019). Historically, human-generated images have been intricately crafted utilising artistic expertise, offering a nuanced understanding of cultural and contextual importance. Recent advancements in artificial intelligence (AI) have resulted in a growing utilisation of AI-generated images produced by algorithms and machine learning models (Jones & Johnson, 2020).

The aim of this study is to evaluate and compare the effectiveness of images generated by artificial intelligence (AI) against those created by humans in online advertising. The study will focus on key performance measures such as user engagement, click-through rates, and conversion rates. This study provides significant insights into the influence of these two types of images on advertising outcomes. Furthermore, it addresses ethical concerns in AI-generated images, including authenticity, bias, and representation, so contributing to the continuing discourse in digital marketing and artificial intelligence.

Research Questions

RQ1What are the key differences in user engagement between visuals generated by artificial intelligence and

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those crafted by designer in Google Ads?
RQ2: How do click-through rates (CTR) and conversion rates differ between images produced by artificial intelligence (AI) and those created by humans?
RQ3: How do consumers evaluate the authenticity and emotional impact of images generated by artificial intelligence in comparison to those created by humans?

Research Objectives

1. To evaluate the effectiveness of AI-generated versus human-generated images concerning key advertising metrics, including click-through rate (CTR) and conversion rates.
2. To examine consumer perceptions of emotional engagement while interacting with AI-generated versus human-generated graphics in advertisements.
3. To investigate ethical implications, including potential biases and representation issues, in the application of AI-generated images in digital marketing.

Literature Review

The significance of visual representation in advertising is extensively studied and is recognised to influence customer behaviour (Jain et al., 2023). The shaping of perception, the promotion of engagement, and the impact on purchasing decisions are all contingent upon the efficacy of visual content (Smith, 2019). Historically, the preference for human-generated images has been based on their capacity to accurately represent cultural significance and authenticity(Rahman et al., 2024b), therefore fostering emotional connections with customers (Brown & Lee, 2021).

Utilising AI-Generated Images in Marketing

Utilising machine learning and deep learning methodologies, AI-generated images offer significant advantages in optimal performance, scalability, and customisation(Mane & Lal, 2021).Artificial intelligence systems can analyse extensive data sets and provide personalised content, enabling marketers to optimise their campaigns based on individual preferences (Chen et al., 2022). In sectors such as e-commerce, where customisation is vital, numerous studies indicate that graphics produced by artificial intelligence (AI) frequently surpass those developed by humans regarding click-through and conversion rates (Gupta & Kumar, 2018).

Research indicates that content generated by artificial intelligence often lacks sufficient emotional depth and contextual comprehension (Mane et al., 2023). Despite their considerable achievements, artificial intelligence (AI) models are constrained by the data on which they are taught and may fail to accurately duplicate the intricate cultural nuances(Lal et al., 2024) and emotional resonance that images created by humans inherently convey (Wang & Smith, 2020). This limitation is particularly evident in areas such as real estate and hospitality, which predominantly depend on emotive narratives(Baidya et al., 2024).

Analysis of User Perception and Emotional Engagement

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The efficacy of advertising efforts is significantly influenced by emotional engagement (Jones & Johnson, 2020). Empirical data indicates that advertisements eliciting strong emotional responses are more likely to foster greater user engagement and brand loyalty (Rahman et al., 2022). Chen et al. (2022) assert that, in contrast to AI-generated images, human-generated images—created with an understanding of cultural and contextual nuances—tend to elicit more intense emotional responses(Rahman et al., 2024a).
Nevertheless, one cannot overlook the efficiency and customisation potential of data generated by artificial intelligence. Despite the common perception that human-generated content is more authentic, research on user interaction with AI and human-generated photography indicates that AI-generated images perform effectively in dynamic contexts where immediate adaptation and customisation are essential (Gupta & Kumar, 2018).

Ethical Implications of Images Generated by Artificial Intelligence

Research concerning the ethical implications of AI-generated images remains in progress. Johnson and White (2019) emphasise that information generated by artificial intelligence can perpetuate biases inherent in the data sets utilised to train the algorithms (Mane et al., 2025). This impacts matters of diversity and representation, as artificial intelligence models may reinforce stereotypical portrayals of gender, race, and ethnicity, so maintaining conventional notions regarding these dimensions (Lal & Sharma, 2021). Furthermore, the absence of transparency in the generation of algorithmic images prompts enquiries on accountability and the capacity to alter user perceptions.

These ethical concerns necessitate a more thorough examination of the utilisation of AI-generated graphics in advertising (Lal et al., 2025). Advertisers must ensure that their utilisation of artificial intelligence technology adheres to ethical norms and does not contribute to the dissemination of distortion or bias (Wang & Smith, 2020).

Research Methodology

This study utilises a qualitative research technique to examine the comparative efficacy of images produced by artificial intelligence (AI) vs those created by humans in the realm of Google Ads online advertising. This study clearly examines user engagement, their opinions, and ethical considerations. This study employs a mixed-method approach to comprehensively analyse user behaviour and preferences, primarily focussing on qualitative methodologies.

Research Design

The research was executed in two phases: initially, qualitative interviews were performed, followed by an analysis of advertising campaigns based on the substance of those advertisements. The participants for the qualitative interviews were selected using a method called purposive selection. This strategy guaranteed that the sample comprised individuals with prior experience engaging with television advertising produced by both artificial intelligence and humans. A total of twenty-five individuals from the Delhi National Capital Region were selected for interviews. The interview questions concentrated on users' perspectives of the authenticity, emotional impact, reliability, and preferences of information generated by artificial intelligence

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compared to human-authored writing.

Table 1: Research Phases and Corresponding Methods

Sl. No	Phase	Description	Methodology Used	Tools/Techniques
1	Phase 1	Exploration of user perception through interviews	Qualitative - Semi-structured interviews	NVivo for thematic coding and analysis
2	Phase 2	Analysis of ad content and engagement	Content analysis & descriptive statistics	Web scraping, Google Ads metrics (CTR, conversions, engagement rates)

Analysis of Qualitative Data

A comprehensive series of semi-structured interviews was done with individuals who regularly engaged with Google Ads across several industries, including e-commerce, real estate, and hospitality, among others. The researchers had questions aimed at assessing emotional involvement, authenticity, visual appeal, and the appraisal of ethical considerations in advertising graphics. Following recording, transcription, and theme analysis, the data acquired from interviews were evaluated. The software NVivo was utilised to facilitate the detection of recurring themes and patterns in the collected replies.

Table 2: Sampling Details for Qualitative Interviews

Sampling Method	Sample Size	Location	Industry Representation	Criteria for Selection
Purposive Sampling	25 Participants	Delhi NCR	E-commerce, Real Estate, Hospitality	Prior exposure to Google Ads with both AI and human-generated images

The subsequent interview questions were posed to the respondents:

1. "How would you describe your experience with digital advertisements utilising artificial intelligence-generated visuals compared to those created by humans?"

Two. "Which type of imagery do you consider more authentic and emotionally compelling, and on what basis?"

Three. "Do you harbour any concerns regarding the use of artificial intelligence-generated images in advertising?"

Table 3: Key Interview Questions for Qualitative Data Collection

Question No.	Interview Question

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1	How would you describe your experience with digital advertisements utilising AI-generated visuals compared to those created by humans?
2	Which type of imagery do you consider more authentic and emotionally compelling, and on what basis?
3	Do you harbour any concerns regarding the use of AI-generated images in advertising?

Table 4: Thematic Categories Identified in Qualitative Interviews

Sl. No	Theme	Description	Frequency (%) Among Participants	Industries Where Theme was Prominent
1	Emotional Impact	Human images perceived as more emotionally resonant	76%	Real Estate, Hospitality
2	Authenticity	Human visuals seen as more trustworthy	84%	All sectors
3	Visual Appeal	AI visuals viewed as more aesthetically tailored	68%	E-commerce
4	Ethical Concerns	Skepticism regarding transparency of AI-generated content	60%	Real Estate, Hospitality
5	Personalization	AI visuals praised for user-targeted customization	72%	E-commerce

Content Analysis

The second phase involved doing a content analysis of advertising obtained from Google Ads. These adverts were created either by artificial intelligence or by humans. The objective of the content analysis was to discern notable visual elements, including colour schemes, composition, and topic matter, to ascertain the extent of the correlation between these attributes and user engagement levels. Descriptive statistics were employed to assess measures including click-through rates, conversion rates, and engagement levels for advertisements generated by both artificial intelligence and human agents. The data was gathered using web scraping technologies and subsequently analysed to discern patterns and trends in user behaviour.

Table 5: Content Analysis of Visual Attributes in Ads

Sl. No	Attribute	AI-Generated Ads	Human-Generated Ads
1	Dominant Color Schemes	Dynamic, High-Contrast	Warm, Natural
2	Composition	Centrally Focused, Clean Layout	Story-Driven, Relatable Scenes
3	Subject Matter	Product-Centric	Emotion-Centric
4	Text Overlays	Algorithmically Optimized	Contextual and Descriptive

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5	Imagery Variation	High (Automated per user)	Low to Moderate

Data Collection and Instrumentation Design

During the execution of semi-structured interviews aimed at gathering qualitative data, participants' responses were recorded and later transcribed. The software NVivo was employed to do coding and thematic analysis. Qualitative data was collected from Google Ads campaigns using site scraping techniques. The click-through rate (CTR), conversion rates, and engagement rates were benchmarks gathered for advertisements produced by artificial intelligence (AI) and those created by professionals. Descriptive statistics were employed for the statistical analysis.

Table 6: Google Ads Performance Metrics Comparison

Sl. No	Metric	AI-Generated Images	Human-Generated Images
1	Average CTR (Click-Through Rate)	4.5%	4.0%
2	Conversion Rate	3.2%	3.7%
3	Engagement Time (avg. time spent per ad)	8.5 seconds	10.2 seconds
4	Bounce Rate	58%	47%
5	Sector-wise Best Performance	E-commerce	Real Estate, Hospitality

Sampling Techniques

The strategy of purposive sampling was selected as the optimal method for both the qualitative interviews and the content analysis. Participants were selected for the study based on their exposure to online advertisements and their capacity to conduct a deep examination of the distinctions between images generated by artificial intelligence and those created by humans. The selection criterion provided equitable representation across businesses including e-commerce, real estate, and hospitality. These are all domains where visual material is crucial for attaining optimal results in advertising.

Table 7: Ethical Considerations Identified by Participants

Sl. No	Concern	Percentage of Respondents	Description
1	Lack of Transparency	64%	Concern over not knowing whether the image is AI-generated
2	Data Privacy	52%	Risk of data misuse through algorithmic personalization
3	Emotional Disconnect	48%	Belief that AI images lack human empathy and emotional nuance

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4	Misrepresentation	44%	Fear that AI images may mislead user expectation

Data Analysis and Interpretation

The data synthesis in the realm of online advertising unveiled some notable findings concerning the comparative efficacy of images produced by artificial intelligence (AI) versus those created by humans. The inquiry comprised two phases: the initial phase involved a qualitative assessment of interview data, while the subsequent phase entailed a quantitative analysis of engagement metrics acquired from Google Ads.

Analysis of Qualitative Data

The thematic analysis of the interview responses identified several key topics, notably that a significant majority of participants favoured images created by humans due to their perceived authenticity and ability to evoke stronger emotional responses. The majority of participants observed that visuals generated by artificial intelligence, despite their aesthetic allure, often elicited a perception of being "mechanical" or "impersonal." This viewpoint was especially prominent in sectors like real estate and hospitality, where fostering an emotional connection is paramount. The use of human-generated graphics was found to have a favourable link with perceived trustworthiness. Participants demonstrated a heightened inclination to trust advertisements including content created by humans. This was because they perceived such advertising as more authentic and less susceptible to misleading influences. The images generated by artificial intelligence were met with scepticism, especially when participants recognised that the content was created by an algorithm.

Notwithstanding these reservations, participants recognised the benefits of artificial intelligence-generated photos regarding their versatility and flexibility to meet particular requirements. Graphics generated by artificial intelligence are seen more effective in select businesses, like e-commerce, where personalising marketing to align with individual interests is paramount. Nonetheless, the absence of deep emotional complexities remained a considerable issue.

Analyse the Data Utilising Qualitative Techniques

Observations of the website and content analysis reveal that, compared to photos created by people, those generated by artificial intelligence exhibited markedly superior click-through rates (CTR) in the e-commerce sector. The AI-generated images exhibited a click-through rate (CTR) 12% superior to that of human-generated images. This is likely attributable to AI's capacity to dynamically respond to user preferences in real time.

Human-generated images had a conversion rate that was five percent superior to that of images generated by artificial intelligence. This was especially evident in sectors that predominantly depend on emotional engagement, such as the hospitality and real estate industries. According to this data, AI-generated graphics are proficient at attracting clicks, although they may struggle to translate those clicks into significant engagements. This is particularly applicable in sectors that predominantly depend on emotional engagement.

Humans created graphics that led to increased user engagement, as indicated by the duration of time spent on adverts (Aarzoo & Lal, 2025). These findings indicate that customers were more inclined to engage with and invest time in content created by individuals, even if they were more prone to click on advertisements

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generated by artificial intelligence.

Findings and Results

The findings indicate that artificial intelligence-generated visuals, while providing considerable benefits in scalability and customisation, lack emotional engagement and reliability. Conversely, human-generated visuals are more adept at creating authentic and emotionally resonant experiences; but, they may lack the efficiency and adaptability seen in content produced by artificial intelligence.

Discussion

This study elucidates the advantages and disadvantages of visuals produced by artificial intelligence compared to those created by humans in the realm of internet advertising. In businesses necessitating personalisation and scalability, such as electronic commerce, artificial intelligence-generated images proves highly effective(Rahman et al., 2024). The restricted emotional profundity and perceived absence of authenticity in these messages, however, impede their efficacy in sectors that predominantly depend on emotional narrative and trust, such as hospitality and real estate. Despite being less cost-effective and scalable, human-created images offer an emotional connection and authenticity that artificial intelligence-generated graphics cannot achieve. Advertisers must combine the necessity for effectiveness with the importance of fostering an emotional connection in their advertising campaigns. This can be achieved by considering the distinct advantages provided by each style of visual representation.

Further investigation is required about the ethical ramifications of image-generating technology. The ongoing advancement of artificial intelligence technology necessitates enhanced openness and responsibility in the use of AI-generated material. Advertisers must provide assurances that their use of artificial intelligence (AI) adheres to ethical norms and does not promote bias or distortion.

Conclusion

This study offers significant insights into the comparative effectiveness of images generated by artificial intelligence vs those created by humans in the realm of internet advertising. This report presents that Human-generated images possess a superior ability to evoke emotional resonance and foster trust compared to those produced by artificial intelligence, notwithstanding the scalability and customisation capabilities of AI-generated visuals(Kumar & Lal, 2023). Marketers ought to leverage the advantages provided by both forms of visual representation, while considering the objectives of their advertising campaigns and the industries in which they function. Furthermore, it is imperative to tackle ethical issues to guarantee that images produced by artificial intelligence are devoid of bias or distortion.

Recommendations

Utilising pictures generated by artificial intelligence is advisable for advertisements in industries that prioritise personalisation and scalability. Sectors that are emotionally driven should depend on visuals created by humans.

To ensure justice, diversity, and the elimination of bias, it is imperative to establish ethical guidelines for the use of imagery generated by artificial intelligence.

Further research is advised to assess the long-term effects of AI-generated graphics on consumer confidence

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and engagement.

Limitations

This study is constrained by various considerations. The research primarily focusses on Google Ads within the Delhi National Capital Region (NCR), which may not accurately reflect the entirety of online advertising behaviours found in other regions or platforms. The collection of AI-generated and human-generated images may not encompass all variations of visual material used in advertising, potentially constraining the generalisability of the findings. Moreover, the reliance on user input and metrics such as click-through rates (CTR) and conversion rates may not have sufficiently encapsulated the intricacies of consumer behaviour or the enduring effects of imagery in advertising campaigns. The ethical implications, including the potential for bias in content produced by artificial intelligence, are recognised; yet, future research may require a more comprehensive examination of these concerns.

Future Directions of the Research

Over time, the scope of this research may expand into several domains. Future research may extend beyond Google Ads to explore diverse online advertising platforms, including social media, video platforms, and e-commerce websites(Lal, 2023), to enhance understanding of the effectiveness of AI-generated images across various digital contexts. Furthermore, additional research might examine the impact of AI-generated visual content on diverse demographic groups and cultural contexts to assess its efficacy across multiple global markets. Future research may examine the ethical ramifications of AI-generated images, particularly with representation, bias, and customer trust, as well as the outcomes of prolonged user involvement and brand loyalty. Furthermore, as artificial intelligence technology advances, researchers will have the ability to explore the many impacts of generative AI tools, such as deep learning models, on advertising and other facets of digital marketing strategy.

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