

AI-GENERATED AND HUMAN-GENERATED IMAGES IN DIGITAL ADVERTISING CAMPAIGNS TO EXAMINE USER ENGAGEMENT AND PERCEPTION ON SOCIAL MEDIA

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Abstract

Artificial intelligence-generated images are increasingly common in digital advertising, complementing conventional human-created content. This study analyses the extent of user engagement and perception of artificial intelligence-generated photos on social media platforms compared to human-generated images. This research project investigated the use of netnography and social media data to analyse customer engagement and interactions with diverse images employed in advertising campaigns. Data were collected from several internet advertising campaigns by multiple firms, and qualitative research was conducted to analyse the underlying user attitudes. The study's findings offer substantial insights into the effectiveness of images generated by artificial intelligence, the ethical implications of these graphics, and their influence on user engagement within the advertising industry.

Keywords- artificial intelligence, humans generated images, digital marketing, social media analytics, user engagement, netnography, and online advertising.

Introduction

The proliferation of artificial intelligence (AI) is increasingly apparent in its impact on numerous brands (Ratta et al., 2024). The emergence of artificial intelligence-generated images has catalysed a shift in creative practices within the advertising industry (Shevchyk, 2024). These images offer a level of accuracy, efficiency, and customisation that is often unattainable by human-produced visuals (Lal & Sharma, 2021). This article seeks to analyse the growing relationship between graphics generated by artificial intelligence and those created by humans in digital advertising, specifically evaluating their impact on user engagement and interaction on social media platforms. Mane et al. (2023) contend that photographs are an essential component of advertising tactics in the current social media environment (Horgby & Galizzi, 2024). These graphics serve as visual stimuli that attract attention and influence consumer behaviour. While artificial intelligence-generated graphics offer a cost-effective means of content generation, concerns about their authenticity and the ethical implications have arisen (Sarkar & Lal, 2023). This study investigates the growing imperative to comprehend client perceptions of images generated by artificial intelligence (AI) and the effectiveness of these images in online advertising. Despite comprehensive research on user engagement with human-created material, there persists a lack of understanding regarding the impact of artificial intelligence-generated visuals on consumer behaviour and brand perception (Yang, 2024).

Background of the Study

Historically, digital advertising has relied heavily on human creativity to design visually appealing components. Rahman et al. (2024a) contend that photographs produced by humans generally demonstrate a higher level of authenticity. This results from the engagement of human intuition and creativity in the process. However, the rapid advancement of artificial intelligence is catalysing a change in the field of digital content creation (Arshad, 2023). Machine learning algorithms that analyse large datasets to produce hyper-personalized content are responsible for the generation of artificial intelligence-created photographs (Villanthenkodath et al., 2024). This modification marks a crucial juncture in advertising, embodying the

intersection of the needs for authenticity and innovation with the necessities of efficiency and cost-effectiveness (Basit et al., 2024).

The application of artificial intelligence (AI) in digital advertising began in the early 2000s; nevertheless, significant progress in AI-generated picture technology has only occurred in the last ten years (Saika et al., 2021). In contrast to traditional methods, companies such as Google and Adobe have developed artificial intelligence algorithms that can produce highly realistic photos at a markedly lower cost (Singh et al., 2022). The escalating utilisation of this technology by advertisers for targeted and personalised adverts has led to a rise in artificial intelligence-generated content on social media platforms.

Despite these advancements, humans continue to grapple with understanding the implications of visuals generated by artificial intelligence. Research demonstrates that individuals appreciate the distinctiveness and precision of content generated by artificial intelligence; nonetheless, some studies express concerns regarding the authenticity and reliability of such material (Mane & Lal, 2021). This study analyses perceptions by contrasting user engagement and interaction with visuals generated by artificial intelligence (AI) versus those made by people in online advertising campaigns. By analysing user responses to these images, ads can more efficiently tailor their content strategies for the intended audience.

Objectives of the Research

Artificial intelligence-generated images are increasingly common in digital advertising, complementing conventional human-created content. This study analyses the extent of user engagement and interaction with images generated by artificial intelligence.

1. To assess user engagement levels in social media advertising between images generated by artificial intelligence (AI) and human generated images.
2. To investigate consumer impressions of images generated by artificial intelligence in comparison to those generated by humans.
3. To analyse user sentiments on social media regarding images generated by artificial intelligence in advertising campaigns.

Research Questions

RQ1 What are the distinctions in user engagement between graphics generated by artificial intelligence and those made by humans in social media advertising campaigns?

RQ2 What are the key factors influencing user perception of visuals produced by artificial intelligence versus those developed by humans?

RQ3 In the domain of digital marketing, how does user engagement with images generated by artificial intelligence contrast with that of images crafted by humans?

Rationale

This study investigates user engagement and interaction with images generated by artificial intelligence and those created by humans on social media platforms, such as Facebook, Instagram, and X (Twitter). The research focusses solely on visuals, omitting other forms of information produced by artificial intelligence, like films and written material. This study examines these platforms to clarify the effectiveness of different types of images in critical advertising contexts, where visuals greatly influence user engagement.

This research was prompted by the growing use of artificial intelligence (AI) in content generation, particularly in the advertising industry. A knowledge gap persists owing to inadequate research on the effectiveness of AI-generated images for user engagement, although their rising popularity. Rectifying this weakness may provide advertisers with critical insights to improve their marketing strategies.

Significance of the Study

The outcomes of this study will improve both academic and practical applications. This research enhances the existing knowledge regarding the utilisation of artificial intelligence in advertising, particularly with user engagement. This research will elucidate the ethical implications of content produced by artificial intelligence, a field that has received scant attention in advertising studies (Rehman et al., 2024b). The study provides practitioners with effective ideas for integrating artificial intelligence-generated graphics into advertising methods. By understanding customer preferences, organisations can develop more effective advertisements that utilise artificial intelligence technologies while ensuring authenticity and reliability. The results will assist designers and content creators in confronting the ethical dilemmas associated with images produced by artificial intelligence, ensuring that their technical applications conform to customer expectations and ethical standards.

Review of Literature

A considerable body of literature has been investigated about human-generated material, specifically analysing user involvement and interaction on social media platforms. Lal et al. (2025) contend that images produced by individuals are often seen as genuine and relevant. These characteristics are crucial for fostering trust and brand allegiance. Images produced by humans demonstrate significant creativity and intellect (Labajová, 2023). Studies by Mane et al. (2023) and Singh et al. (2021) demonstrate that customers are more likely to interact with material they consider genuine and aligned with their personal convictions.

In contrast, graphics produced by artificial intelligence offer a unique vibrancy. Intricate algorithms are utilised to produce content generated by artificial intelligence (Matthews et al., 2023). These algorithms tailor graphics based on user data, enabling hyper-personalization (Chen et al., 2024). Rahman et al. (2022) contend that this may augment user engagement by delivering content that is highly relevant to specific target demographics. The question of whether individuals regard this content as authentic continues to be a point of interest. Kumar and Lal (2023) assert that while pictures created by artificial intelligence can achieve greater accuracy, they may lack the emotional resonance characteristic of human-generated content.

Rehman et al. (2024a) state that theoretical frameworks such as the Uses and Gratifications Theory (UGT) propose that consumers interact with content based on its effectiveness in fulfilling their requirements for information, enjoyment, and personal identity associated with the material. One can attain a more profound understanding of human perception of images generated by artificial intelligence, which may fulfil informational standards yet fail to satisfy emotional or entertainment requirements (Gupta, 2024).

Moreover, ethical concerns about images generated by artificial intelligence are becoming increasingly important. A recent study (Jain et al., 2023) has highlighted issues with authenticity, manipulation, and the capacity of artificial intelligence to perpetuate biases (Kamath & Alur, 2024). Ethical considerations may affect user engagement with information generated by artificial intelligence, given the importance of trust in online interactions.

Research Methodology

This research examines user engagement and interaction with images generated by both artificial intelligence and humans, employing a qualitative methodology through netnography. Netnography is a sort of anthropological research designed for the analysis of online communities and digital platforms. This method allows researchers to monitor interactions and collect data in a natural setting, which is especially beneficial for assessing user engagement on social media platforms (Sarkar & Lal, 2023).

Protocol for doing a Netnography: research preparation. The inquiry primarily focusses on digital advertising campaigns employing both artificial intelligence-generated and human-created imagery. Facebook,

Instagram, and X (Twitter) are social media networks chosen for their significant user involvement and wealth of visual material.

This study utilises a mixed-methods approach, combining quantitative social media metrics with qualitative Netnographic analysis to examine user engagement with AI-generated and human-generated imagery in digital advertising campaigns. This study examines user engagement with different image kinds on social media sites, highlighting key metrics such as likes, shares, comments, and click-through rates (CTR). This study analyses qualitative user comments to identify impressions of AI-generated versus human-generated graphics, categorised into positive, neutral, or negative interactions.

Selection of Samples

Social media networks like Facebook, Instagram, and X (Twitter) were selected for their significance in image-centric advertising and their extensive facilities for tracking engagement metrics.

Brand and Campaign Selection

A collection of ten advertising campaigns was curated from several industries, including fashion, technology, consumer goods, and travel, to ensure varied coverage. Each campaign utilised a combination of visuals generated by artificial intelligence and those crafted by human contributors. The campaigns were executed over a one-month period, allowing sufficient time for the collection of user interaction data.

Protocols for Data Collection

Step 1: Identification of Campaigns and Platforms

The study selected five campaigns utilising AI-generated images and five campaigns employing human-generated graphics for each platform. The researchers ensured that all efforts align with a singular objective: product launch and brand awareness, to maintain consistency.

Step 2: Collecting Quantitative Metrics from Social Media

The metrics were gathered using Facebook Ads Manager, Instagram Insights, and X (Twitter) Analytics. Likes indicate the user's approval or interaction with the image. Shares indicate the degree to which the image captivated viewers, encouraging them to circulate it inside their networks. Comments provide an in-depth insight into user participation, feedback, and perception. The Click-Through Rate (CTR) is the percentage of people who interacted with the image and subsequently visited a landing page. The Engagement Rate was quantified as a comprehensive indicator that encompasses likes, comments, and shares, determined by dividing all interactions by overall reach. Perception analysis was conducted by categorising comments into positive, negative, or neutral classifications depending on their content.

Step 3: Netnographic Procedure

A thematic analysis of user comments and interactions was conducted to elucidate user impressions of AI-generated photos vs those produced by humans. The principal themes included: Authenticity, Emotional Connection, Visual Appeal, Trustworthiness, and Creativity.

The data was subjected to a rigorous coding and categorisation process, followed by an examination of user comments from each category to clarify emotional responses to the photos.

Step 4: Ethical Considerations

The data employed in this study were solely obtained from publically available social media sources. The qualitative analysis preserved user anonymity by ensuring that no personal identifiers were linked to the data. Approval was obtained from the institutional review board (IRB) to ensure compliance with ethical guidelines

for online research.

Data Analysis and Interpretations

Descriptive statistics were calculated for each variable in the quantitative study to enable a comparison between AI-generated and human-generated photographs across different campaigns. The examination of engagement trends across the ten campaigns was performed using tables. A thematic analysis of user answers was conducted to reveal subtleties in user perception regarding AI-generated and human-generated graphics. Data on social media metrics were gathered for particular advertising campaigns. The figures included the quantities of likes, comments, shares, and engagement rates. The sample includes ten campaigns from various brands, ensuring a wide range of content and audience engagement across the campaigns. Data were collected over a one-month period from August 2024 to September 2024 to assess engagement trends. User comments were analysed to get a comprehensive grasp of their perspectives regarding the photographs.

Thematic analysis was utilised to identify recurring themes in user interactions and comments. The data was categorised into three classifications: "positive engagement," "negative engagement," and "neutral engagement." Subsequent analysis assessed perceptions of images produced by artificial intelligence (AI) in contrast to those created by humans, highlighting the themes of authenticity, trust, and relevance.

The results were evaluated in relation to the contemporary research on user engagement and content generated by artificial intelligence. To elucidate user perceptions and interactions with AI-generated and human-generated photos, social media analytics were combined with qualitative data derived from user comments. Concerning ethical considerations, all data obtained from social media platforms was publicly available, and the study did not employ any personally identifiable information. The study adhered to the ethical standards necessary for online research, ensuring the confidentiality and anonymity of the participant.

Data acquired from social media sites revealed that an image produced by artificial intelligence saw significantly lower user engagement compared to an image crafted by a human. In general, photographs produced by humans received a bigger quantity of likes, comments, and shares, indicating a superior level of engagement. However, pictures produced by artificial intelligence had superior click-through rates, indicating that consumers found them visually appealing and were more likely to interact with the corresponding website (Singh et al., 2022). A qualitative investigation of user feedback revealed varied perspectives on AI-generated imagery. Some praised the creativity and originality of AI-generated content, while others expressed concerns about its authenticity. Individuals often responded to photos generated by artificial intelligence with comments like "This appears too perfect to be real" and "I prefer the human touch." In contrast, photographs created by humans typically elicited responses regarding emotional depth. For example, "This elicits recollections of my youth" or "I appreciate the personal nuance in this image" illustrate comments that were more likely to be articulated (Rahman et al., 2024b).

The results are presented through descriptive statistics, supplemented by tables, and succeeded by an in-depth discussion of the key findings.

Table 1: Quantitative Data Analysis of Social Media Metrics

Sl. No	Platform	Image Type	Likes	Shares	Comments	CTR (%)	Engagement Rate (%)
1.	Facebook	AI-Generated	15,200	1,350	600	3.8	4.1

2	Facebook	Human-Generated	18,500	2,200	900	5.2	5.9
3	Instagram	AI-Generated	22,400	1,500	950	4.1	4.8
4	Instagram	Human-Generated	26,700	2,750	1,300	6.1	6.4
5	X	AI-Generated	8,900	750	420	2.5	2.9
6	X	Human-Generated	11,500	1,200	650	3.9	4.7

Source: Author's own compilation -Social Media Matrix

The results of quantitative analysis suggests, images that were created by humans consistently outperformed those that were generated by artificial intelligence on prominent social media platforms (Facebook, Instagram, and X) in terms of essential engagement metrics. These metrics include likes, shares, comments, click-through rate (CTR), and overall engagement rate. Images that were made by humans received significantly more engagement, with up to 21.7% more likes and 63% more shares on Facebook than images that were created by machines. Images that were developed by humans received 19.2% more likes and 45.3% more shares on Instagram compared to those that were generated by artificial intelligence. This was a considerable differential with regard to Instagram. Furthermore, the data revealed that click-through rates for human-generated photos were higher than those of other types across a variety of platforms. This suggests that users viewed these images to be more relatable, and as a result, they were more likely to engage with them. When compared to images generated by artificial intelligence, which, despite their creative potential, were shown to be less effective in fostering active user participation, content that was produced by humans was found to facilitate more engagement and interaction among users. Based on this tendency, it appears that authentic visuals that are made by humans are more effective in drawing the attention of the audience and promoting higher engagement.

Table 2: Perception Analysis of User Comments

Sl. No	Platform	Image Type	Total Comments	Positive (%)	Neutral (%)	Negative (%)
1	Facebook	AI-Generated	600	45	35	20
2	Facebook	Human-Generated	900	70	20	10
3	Instagram	AI-Generated	950	48	37	15
4	Instagram	Human-Generated	1,300	72	18	10
5	X	AI-Generated	420	40	42	18
6	X	Human-Generated	650	65	27	8

Source: Author's own compilation -Social Media Matrix

Images created by humans demonstrated a superior positive view of the company across all media (Sufi, 2024). Analysis of Instagram data indicates that 72% of comments on human-created photographs were favourable, whereas only 48% of comments on AI-generated images exhibited a comparable sentiment. The investigation indicated that AI-generated photos garnered a higher percentage of neutral and negative remarks, with X (Twitter) noting that 42% of the comments about these images were neutral. The information generated by humans exhibited a heightened emotional resonance, leading to more positive reactions. Conversely, AI-generated images were perceived as less authentic, resulting in a rise in neutral and unfavourable impressions.

Table 3: Analysis of AI-Generated vs. Human-Generated Images Related to Brand Campaigns

Brand	Campaign Type	Image Type	Category	Positive Comments (%)	Negative Comments (%)	Neutral Comments (%)	Key Themes from Comments
Nike	Brand Awareness	Human-Generated	Authenticity	78%	12%	10%	Positive comments emphasized the authenticity and connection with brand identity. Negative comments focused on repetition.
Adidas	Product Launch	AI-Generated	Creativity	65%	20%	15%	Users appreciated the creativity of AI-generated visuals but noted the lack of emotional depth and human connection.
Coca-Cola	Brand Awareness	Human-Generated	Emotional Connection	82%	8%	10%	High emotional engagement, especially for nostalgic themes. Negative feedback cited overuse of similar concepts.
Apple	Product Launch	AI-Generated	Visual Appeal	60%	25%	15%	Positive responses praised visual appeal, but concerns over lack of

							authenticity and emotional resonance were notable.
Samsung	Brand Awareness	Human-Generated	Trustworthiness	80%	10%	10%	Trustworthiness was highlighted, with some users citing reliability of the campaign message. Negative comments were minimal.
Pepsi	Product Launch	AI-Generated	Emotional Connection	55%	30%	15%	AI-generated images were perceived as less emotionally engaging and authentic, which led to higher negative sentiments.

Source Author's own compilation

The investigation reveals notable differences in consumer impressions of AI-generated and human-generated pictures in advertising campaigns for businesses including Nike, Adidas, Coca-Cola, Apple, and Pepsi. Human-generated images regularly achieved higher ratings in Authenticity, Emotional Connection, and Trustworthiness, with brands such as Nike and Coca-Cola receiving 78-82% positive feedback about these qualities. Conversely, AI-generated graphics shown significant strengths in creativity and aesthetic appeal; yet, they were inferior in fostering emotional connection and trust. Brands like Adidas and Apple garnered positive responses to their AI-generated images; yet, customers often felt a sense of detachment due to a perceived lack of authenticity.

Table 4.0: Classification of Comments on AI-Generated and Human-Generated Images in Digital Advertising

Sl. No	Comment	Sentiment	Classification
1	"The ad feels genuine and relatable; I can connect with the message."	Positive	Authenticity
2	"The visuals are amazing, really creative and futuristic!"	Positive	Creativity
3	"The ad lacks emotional depth, feels too artificial."	Negative	Emotional Connection
4	"I love how the brand stays true to its roots with this campaign."	Positive	Authenticity
5	"The image looks good, but I can't trust something that's made by AI."	Negative	Trustworthiness
6	"It's okay, nothing new or special in terms of visuals."	Neutral	Visual Appeal
7	"This AI-generated ad looks super creative and bold!"	Positive	Creativity
8	"I appreciate the nostalgia in this campaign, feels emotionally touching."	Positive	Emotional Connection
9	"It feels forced and overused, not as engaging as the older campaigns."	Negative	Creativity/Emotional Connection
10	"The product looks sleek, but the ad lacks the human touch."	Negative	Trustworthiness/Authenticity
11	"Very informative and appealing, I'd definitely try this product."	Positive	Visual Appeal/Trustworthiness
12	"I don't understand why this AI image looks so robotic, not my taste."	Negative	Emotional Connection
13	"Solid visuals, but I think I've seen something like this before."	Neutral	Creativity
14	"I trust this brand, and their human-generated ads always reflect that."	Positive	Trustworthiness
15	"It's innovative, but there's no emotional connection in this AI image."	Negative	Emotional Connection
16	"Looks cool, but doesn't feel real."	Neutral	Authenticity
17	"This campaign is refreshing and connects with the younger audience."	Positive	Creativity/Visual Appeal
18	"The image quality is nice, but I don't feel any real connection to the brand."	Neutral	Emotional Connection
19	"AI-generated images are visually impressive, but they miss the personal touch."	Negative	Trustworthiness/Authenticity
20	"It's engaging and visually appealing, great use of creativity."	Positive	Visual Appeal/Creativity

Source: Author's own compilation -Social Media Matrix

This table classifies 20 user comments regarding AI-generated and human-generated images in advertising campaigns based on their perceptions of the brand's digital campaign—positive, negative, or neutral. The table outlines key aspects such as honesty, emotional connection, inventiveness, visual appeal, and trustworthiness. Comments often highlighted the ingenuity and aesthetic allure of AI-generated photographs, while human-generated images were praised for their authenticity and reliability. Critiques frequently emphasised the lack of emotional involvement and characterised AI-generated entertainment as possessing a “robotic” or “artificial” aspect. The indifferent remarks suggested general contentment with the sights; yet, they lacked substantial emotional involvement or a profound connection. This analysis allows brands to pinpoint the factors that most effectively engage audiences and underscores areas.

Finding & Results

The results demonstrate that while AI-generated visuals provide novel opportunities, human-created material remains more effective in cultivating emotional connections and trust in digital advertising efforts, particularly those focused on increasing brand awareness. Research suggests that although AI-generated visuals might attract user attention, they may not provoke the same level of emotional involvement as content intentionally created by humans. Users are more likely to interact with content they consider authentic and relatable, leading to a stronger connection with graphics produced by humans. Images produced by artificial intelligence are highly configurable and tailored to user preferences, potentially improving click-through rates and driving conversions. The use of artificial intelligence for visual generation has significant ethical implications. Several individuals expressed concerns about the possible influence of AI-generated images on their behaviour, and user feedback revealed considerable anxiety around manipulation and authenticity. Advertisers must rigorously assess the ethical ramifications of integrating AI-generated content into their marketing strategies.

Conclusion

The outcomes of this study provide substantial insights into user interactions with images generated by artificial intelligence (AI) and humans in social media advertising campaigns. Human-generated content is more effective than AI-generated images in cultivating emotional bonds and trust. AI-generated images provide advantages in terms of customisation and accuracy. Marketers should deliberately integrate artificial intelligence-generated images with human-created content in advertising campaigns to create visually attractive and emotionally resonant ads.

Future Scope of the research

Future research may concentrate on the incorporation of artificial intelligence-generated videos and alternative materials in digital advertising. Furthermore, graphics produced by artificial intelligence may have lasting effects on consumer brand impression and conduct. Furthermore, further research might investigate the ethical implications of content generated by artificial intelligence, particularly analysing user views regarding the authenticity and dependability of AI-produced images in various contexts.

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