

Effectiveness of generative AI and graphic design in fostering consumer engagement

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Abstract

This paper explores the effectiveness of generative artificial intelligence (GenAI) and its integration into graphic design as a tool to enhance consumer engagement. As digital marketing evolves, GenAI has emerged as a transformative force across industries, particularly in marketing and design. By producing tailored visuals, improving design efficiency, and enabling data-driven creativity, GenAI offers marketers new ways to connect with audiences. The study reviews GenAI's applications in marketing, its influence on consumer psychology, and the evolving role of graphic design in the digital age. Through a mixed-methods approach combining case studies and consumer interaction metrics, the paper evaluates how GenAI enhances customer experiences, brand loyalty, and campaign effectiveness. The proposed 'DESIGN' framework—Data-driven, Efficiency, Scalability, Interactivity, Guidance, and Novelty—illustrates AI's multifaceted contributions to branding. While GenAI streamlines workflows and increases accessibility for non-designers, it also raises ethical concerns regarding authenticity, originality, and creative redundancy. The research highlights gaps in current literature regarding GenAI's impact on marketing strategies and consumer behaviour, especially in the visual domain. The findings suggest that although GenAI significantly boosts consumer engagement, ethical considerations must be addressed to preserve consumer trust and creative integrity. This paper serves as a foundation for future exploration of AI's role in shaping marketing, design innovation, and user experience.

Keywords — Generative AI, Graphic Design, Consumer Engagement, Digital Marketing, Artificial Intelligence, Consumer Psychology, Branding, DESIGN Framework, Personalization, AI Ethics.

I. INTRODUCTION

With the advent of the 21st-century digital revolution, Artificial Intelligence (AI) has emerged as an effective tool in transforming a multitude of different industries, specifically generative AI (GenAI). GenAI refers to algorithms that can generate new material, such as audio, code, pictures, text, videos, etc. (McKinsey & Company, 2024) Due to its rapid evolution, there has been a paradigm shift in the way society utilises AI tools. We now see many individuals and organisations adopting these systems because of the development of new GenAI algorithms. (Mariani, M., & Dwivedi, Y. K., 2024) With the increase in knowledge and accessibility of these tools, businesses have already begun to implement this new technology into their marketing strategies. In the past three years, over 1.7 billion USD has been invested in GenAI solutions by venture capital firms. (Wiles, J, 2023) As of late, the use of GenAI has progressively become more prevalent within a variety of industries due to the rise of digital marketing.

Digital marketing is a way for businesses to capitalise on the growing attention of consumers online. Multiple types of organisations such as hospitals, colleges, councils, non-governmental organisations (NGOs) and more engage in digital marketing as a part of their advertising strategies. (Boddu, R. S. K. et al., 2022) In regards to marketing, the application of these AI systems in advertising tactics has radically changed the way businesses engage with their target markets and foster consumer engagement. (Lim, C. V. et al., 2024) An example would be Michaels Stores utilising GenAI to enhance customer engagement by personalising 95% of its email campaigns, resulting in a 41% and 25% increase in click-through rates. (McKinsey & Company, 2023) Global expenditure on AI-enabled advertising was projected to reach 370 billion USD in 2022, and over the next ten years, it is expected to reach 1.3 trillion USD. (Statista, 2023) The advancement of GenAI has allowed it to take on complex roles in marketing, which were once mainly reliant on manual labour. An arena that has been saturated with the use of GenAI in recent trends is graphic design.

Graphic design has become the most significant industry in the modern world because of its contributions to better user experiences, application and website layouts, product advertising, marketing optimisation, brand logo creation, and game design. (Sindhura, S. P., & Abdul, A., 2021) Since this field is heavily computer-based, it is one industry that has had the maximum incorporation of AI. Currently, businesses like Netflix and Amazon are utilising AI to evaluate consumer data and customise items and artworks for their users. (Walch, K., 2019) Naturally, it will be quite difficult for AI to fully replace human creativity, but as it develops, it will undoubtedly enable businesses to save expenses and boost productivity when it comes to producing designs for marketing campaigns. With a plethora of GenAI programs available at our fingertips, such as DALL-E 2, Runway and even Adobe's Photoshop, individuals now have the power to generate multiple pieces of content just

by simply typing a prompt. With a transition of algorithms from 2D to 3D generation, it might also be used to create interactive, immersive experiences for people to investigate a range of design possibilities. (Vahdat, A., et al., 2022) The shift in business marketing is evident with companies now having access to AI-driven tools which can tailor packaging designs according to recent trends and also to predict consumer behaviour. There has been an influx of people designing their own brand’s packaging with the aid of GenAI. (Anna, V., 2024) The interpolation of these systems with something such as packaging design will be critical in having a competitive edge in the market. Unlike in the past, when consumers concentrated more on the product and packaging was less significant, today the product's packaging has taken precedence over the product itself. (Polat, B., 2022) However, there are also debates being sparked online regarding how ethical GenAI is and the implications of using it in marketing. Businesses must now decide whether to employ it or not, as social attitudes regarding GenAI may not be positive. Consumers' opposition to AI-generated art may jeopardise brand loyalty if used in marketing strategies. With the increase in technological advancement, people's perceptions of advertising and marketing have already begun to shift.

Despite GenAI’s significance in today’s world, studies on its relationship with marketing strategies and consumer psychology, particularly concerning graphic design, are noticeably lacking. Since AI is a relatively young field, there is limited knowledge of its applications in business research and practices. (Jain, V., Rai, H., Parvathy, P., & Mogaji, E., 2023) As a result, we are missing a comprehensive understanding of the consequences of GenAI in the design arena and its effects on consumer behaviour. Therefore, an understanding of the effectiveness of GenAI in boosting engagement is necessary. To bridge these gaps, this paper provides an extensive review of the implications of GenAI on social views and its association with business strategies.

The purpose of this article is to provide knowledge about the potential advantages and ramifications that result from the nexus between GenAI and consumer psychology. It is intended to provide a foundation for future research and to aid academics by analysing the implications on different stakeholders such as designers, marketers and GenAI developers. In conclusion, this research paper aims to provide a thorough comprehension on the consequences of GenAI being associated with graphic design and offer insights into the development of marketing



Fig 1. The Advantages and Disadvantages of Both Traditional Graphic Design and AI Incorporated Design.

This figure 1 shows a comparative analysis between traditional design practices and those that incorporate GenAI. Traditional graphic design is efficient in encouraging creative thought, storytelling and handcrafted visuals, but it is extremely time-consuming and is limited by human bandwidth. AI-incorporated design, on the other hand, provides unrivalled efficiency, the capacity to rapidly produce various design variations, and access to advanced features such as automatic scaling or colour matching. However, it also raises worries about potential over-reliance on algorithms, diminished creative control, and ethical considerations such as biases in AI-generated work.

II. LITERATURE REVIEW

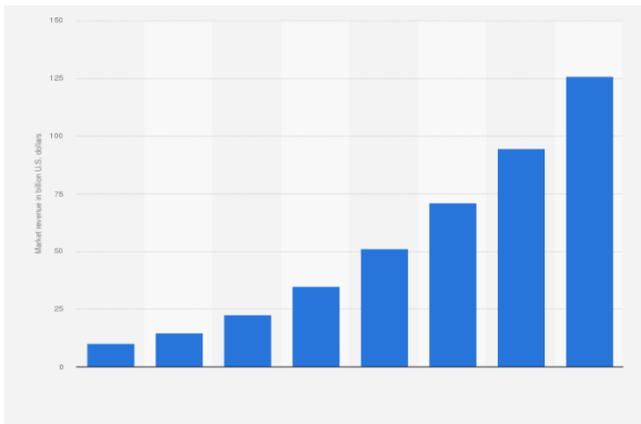
The purpose of this paper is to map, in connection to GenAI, the conceptual framework of three fields: graphic design, marketing and consumer psychology. As a result, this section describes the conceptual underpinnings of AI in each of these disciplines to help guide this literature review.

A. What is Graphic Design?

Graphic design is the art of using visual components including typography, pictures, symbols, lines, forms, text, and colours to communicate messages to an audience. (Siyanbola, A. B., Omolola, S. F., & Adeyemi, A. O., 2021) Graphic design has been around for millennia and has changed continuously throughout time. It was initially utilised in the Stone Ages and is today used for a multitude of purposes across multiple industries. One of those industries being marketing. Since marketing has been evolving alongside technology, the way businesses adapt to the market shifts every few years.

Table 1 showcases the adaptations in marketing and the way companies utilise technology throughout the years to efficiently meet consumer’s demands. It is evident that the shift from Marketing 1.0 to Marketing 5.0 is drastic with 1.0 only focusing on selling products to customers, whereas 5.0 focuses on providing unique experiences for their consumers. In 1.0, according to companies, consumers were merely mass audiences who all demanded the same product with no customisation whatsoever. We now see companies viewing their consumers as real humans with real emotions, allowing them to produce individualistic products for different groups of people. However, as product personalisation increases, so does the company's workload. This is where AI comes in. In comparison to humans, GenAI is more efficient at performing monotonous tasks that don't involve higher-order thinking. As a result, GenAI has gained substantial popularity in the marketing sector.

TABLE I. The Evolution of Marketing



	Marketing 1.0	Marketing 2.0	Marketing 3.0	Marketing 4.0	Marketing 5.0
Aim	Sell products	Satisfy and retain customers	Make the world a better place by creating positive externalities	Human-centered marketing	The use of human-like technology to create, communicate, and deliver
Driving forces	Industrial Revolution	Information technology	New wave of technology	Generation of content on the internet	Advancements in technology that utilise personalisation, automation, and data-driven marketing
The way companies perceive the market	Mass customers with material needs	Intelligent customers	A human with heart, mind and spirit	Equals and partners in a collaborative relationship	Humans with emotional and spiritual needs
Key marketing concepts	Product development	Differentiation	Higher values	Collaboration	Delivering customer experience
Marketing guidelines	Product specifications	Positioning of the company and the product	Mission, vision and company values	Promoting content and creating new brands	Ethics and transparency
Interaction with consumers	One-to-many transactions	One-to-one relations	Many-to-many collaborations	Offline and online relations between companies and consumers	Companies create personalised, data-driven experiences that build authentic relations with consumers

B. AI Applications in Marketing

Marketing is described as the activity, collection of institutions, and procedures for generating, conveying, delivering, and exchanging offerings that have value for consumers, clients, partners, and society in general. (American Marketing Association, 2017) The field of marketing has changed significantly as a result of the ever-growing advancements in technology, specifically AI. There are numerous ways in which businesses can benefit from its usage, since AI allows the utilisation of data-driven decision-making and processing capabilities. (Baltezarevic, R., 2023) An example of this would be webrooming. Webrooming, or examining things online before purchasing them in actual locations, is gaining appeal as AI technology advances. AI-powered solutions such as personalised recommendation engines, chatbots, and virtual try-ons improve the online research experience by allowing customers to obtain thorough product information and tailored recommendations before making a purchase. Unlike showrooming, which involves shoppers visiting stores to inspect things before purchasing online, webrooming provides the ease of digital discovery while retaining the tactile and instantaneous immediacy of in-store shopping. AI-powered tools like visual search and augmented reality let users visualise things in real-world scenarios and make more educated selections. This change is a direct result of AI’s capability to bridge the gap between online research and offline purchasing, which creates a seamless experience in online shopping. Another notable method that AI uses is machine learning, which predicts the most relevant ads for consumers based on pre-existing user data. This method helps to improve targeting accuracy. (Choi, J.; Lim, K., 2020) For example, a machine learning algorithm is used by the streaming service Netflix to create personalised content recommendations based on the history of consumer’s viewing tastes. (Gorgoglione, M.; Panniello, U.; Tuzhilin, A., 2019) This makes it easy to catch the viewer’s attention, which increases “stickiness” and watch time. Additionally, recommender systems, a key component of AI-powered advertising that most people are familiar with today, analyse audience behaviour and provide tailored recommendations to improve user experience and increase engagement. (Lim, C. V. et al., 2024) This is especially prevalent in e-commerce, which notably benefits from using informatics using this method. (Necula, S.; Păvăloaia, V., 2023) Recommender systems are prominently used by social

media platforms like Instagram to promote specific products in accordance with user interests. The accessibility of GenAI programs has given advertisers the power to create captivating content, whether that be for social media, blogs, advertisements, etc. Together, these methods form an AI toolbox that marketers from all sectors can utilise to interact with consumers in more effective and memorable ways.

Fig 2. Market value of artificial intelligence (AI) in marketing worldwide from 2020 to 2028 (in billion U.S. dollars) (Statista., 2024)

Figure 2. shows how AI is firmly established in the digital marketing scene, and according to the most recent estimates, more than 80% of industry professionals use some sort of AI technology in their online marketing efforts. (Statista., 2024) In order to improve client engagement, optimise campaigns, and increase return on investment, industries across the board are progressively incorporating AI into their marketing plans. Large volumes of data are analysed by AI-driven systems to find patterns in customer behaviour, allowing for highly customised marketing that appeals to individual interests. AI-powered chatbots improve user experiences and cut costs by offering immediate, round-the-clock customer service. By using predictive analytics, companies may anticipate trends and modify their messaging to better suit the demands of their target audience. AI also automates tedious processes like ad placement and email segmentation, freeing up marketers to concentrate on innovative strategies. As a result, it is reshaping consumer psychology by creating more personalized and relevant experiences.

C. Impact of AI on Consumer Psychology

The specific field of consumer psychology examines how our attitudes, perceptions, feelings, and ideas affect the products and services we purchase and how we interact with them. Today, we see consumers interacting with AI in a multitude of ways. Marketing academics are aware that AI has significant potential advantages for customers and their lifestyles. (Pitardi, V. et al., 2021) Consumers are already requesting answers directly from GenAI, taking advantage of its powers to acquire relevant and personalised information. (Mogaji, E., & Jain, V., 2024) Customised shopping experiences, tailored ads, and personalised recommendations help customers feel appreciated and understood, which can boost satisfaction and brand loyalty. GenAI also allows individuals to have better judgement when selecting brands to buy from. Due to this, businesses have gradually started to adapt their marketing strategies in order to cater their products in a way that utilises GenAI. For instance, Starbucks uses predictive analytics and machine learning to personalise experiences in real-time. Meanwhile, Alibaba's "Fashion AI" retail outlet in Hong Kong uses AI to enhance the shopping experience with intelligent clothing tags and smart mirrors. (Gera, R., & Kumar, A., 2023) Furthermore, AI improves pricing strategies by dynamically altering rates based on market conditions and customer behaviour. This improves sales performance and provides a competitive advantage. Recommender systems are prominently used by social media platforms like Instagram to promote specific products in accordance with user interests. It is evident that GenAI has several advantages for a range of businesses. However, there are inherent conflicts that the increasing employment of AI may have on customers, such as privacy problems, dehumanisation, and even addiction. (Puntoni, S. et al., 2021) Additionally, AI has the ability to discreetly influence customer behaviour. AI may encourage users to take specific activities, like making impulsive purchases or spending more time on a site, by utilising insights into human psychology. Although these strategies can help businesses succeed, they can also take advantage of cognitive biases and cause unfavourable effects on customers, such as compulsive buying or a dependence on digital platforms. Nevertheless, GenAI enables companies to provide more personalised, efficient, and responsive experiences, dramatically affecting consumer interactions with brands and purchase choices.

D. Opportunities and Drawbacks of Innovation in Graphic Design: Generative Artificial Intelligence

The advertising industry has entered a new era of innovation thanks to artificial intelligence (AI), which offers a variety of tools and apps that are revolutionising campaign optimisation, content production, and personalisation. (Lim, C. V. et al., 2024) With the incorporation of AI-powered image production, individuals now have the ability to produce visual art that was previously exclusive to professional designers and artists. GenAI programs such as DALL-E and Midjourney have the power to generate new visuals based off of textual prompts. This helps with quick prototyping and experimentation with different styles of art, which could help to improve creative workflows. Additionally, GenAI can learn from existing design trends, which can give designers inspiration that is relevant to current market tastes.

It allows individuals to express their own creativity without needing the skills to produce content from scratch. For example, businesses may use GenAI to create visually attractive graphics, illustrations, or memes to enhance their postings and draw in viewers on social media. (Mogaji, E., & Jain, V., 2024) Small businesses and individuals can create professional-quality graphics without needing extensive design skills, reducing the need to hire designers. Though this new technology has given

way for a lot of efficiency and innovation within industries, it also presents several significant drawbacks. A major concern is whether GenAI will make designers and creatives redundant. Furthermore, the use of GenAI in design might present ethical concerns, such as the abuse of technology to generate false or damaging visual material. In addition, AI's dynamic nature necessitates ongoing observation and modification. For algorithms to keep functioning properly, they must be updated on a regular basis, which might require a lot of resources. Businesses who don't update their AI systems run the danger of falling behind in a market that evolves rapidly. Another disadvantage is the risk of homogenization. GenAI systems often rely on existing datasets to generate new designs, which can result in a lack of originality and diversity in creative outputs. Over-reliance on GenAI could lead to designs that are formulaic and lacking in unique, human touch. This demands careful consideration of how AI technologies are utilised, as well as the development of ethical criteria for their usage in the creative business.

Research Objectives:

- 1) To evaluate the usage of GenAI applications in marketing.
- 2) To analyse the impact of GenAI on consumer psychology.
- 3) To highlight the opportunities and drawbacks of innovation in graphic design in regards to GenAI.

Research Gap:

In the twenty-first century, generative AI is transforming businesses at a rapid pace. However, this research focuses on the implications of leveraging generative AI applications in the design industry, including its advantages and possible ethical ramifications when fostering consumer engagement. Studies on AI's relevance to consumer psychology and marketing techniques, especially with regard to visual design, are conspicuously sparse, despite AI's importance in today's society. There isn't much information about AI's uses in business research and practices because the area is still relatively new. Additionally, discussion on how this new wave of technology might affect designers globally is lacking. Consequently, we are missing a thorough comprehension of how GenAI will affect consumer behaviour and what that would mean for the design industry.

Hypothesis:

H₁ - Generative AI usage in graphic design significantly enhances consumer engagement.

H₂ - The integration of generative AI with graphic design positively influences consumer psychology, leading to increased brand loyalty.

H₃ - While generative AI offers opportunities in graphic design, it also poses ethical challenges that may affect consumer trust and the design industry.

Research Questions:

- 1) How can we evaluate the usage of generative AI applications in graphic design for fostering consumer engagement?
- 2) What are the opportunities and drawbacks of innovation in graphic design in regards to generative AI?
- 3) Can generative AI tools lead to possible ethical ramifications concerning graphic design?

III. RESEARCH METHODOLOGY

A research methodology outlines the methods and processes used to find and examine data related to a particular study topic. Researchers utilise this method to plan their study as it includes data collecting, analysis techniques and the general framework in which the study is carried out. This paper uses a mixed-methods approach to assess how well GenAI fosters consumer engagement in graphic design. To provide thorough information on this topic, this study combines quantitative and qualitative assessments. The qualitative data evaluates customer impressions through case studies, while the quantitative approach incorporates consumer engagement indicators, such as click-through rates, time spent on sites and conversion rates. These case studies concentrate on companies using GenAI and how they affect consumer engagement. Multiple graphical representations including mindmaps, are used to show quantitative data, such as the differences between traditional graphic design and AI incorporated graphic design. By using both qualitative and quantitative data, this methodology ensures a comprehensive investigation of GenAI's involvement in consumer engagement within the graphic design arena. Additionally, this paper uses a customised framework named 'DESIGN' to analyse the relationship between AI and branding.

DESIGN:

D - Data-driven

This element focuses on how AI uses data to make informed design decisions. GenAI programs often rely on user data and market trends to create content that resonates with target audiences. Designers can use AI to track and analyse how different consumers react to visual content and tweak them for better customer engagement.

E - Efficiency

This element refers to how AI improves the speed and ease of the design process. AI has the ability to do mundane tasks such as cropping, background removal and font matching automatically, reducing the amount of time it takes for designers to create

visuals. This allows designers to focus more on conceptual thinking, while AI can manage routine work. Furthermore, AI programs can reduce the need for big teams and long production times, which can be extremely beneficial for small businesses.

S - Scalability

AI allows companies to scale their design output across multiple different markets. Instead of human manually designing for different platforms such as Instagram, Youtube, websites, etc., AI can automatically create content to fit various platforms. This can help global brands to localise their content for different customer segments.

I - Interactivity

AI is helping companies in marketing to create more dynamic and interactive content that can respond to user actions, creating a more personalised experience.

G - Guidance

AI can provide designers with useful suggestions, much like a virtual assistant. It could even suggest color palettes, font matchings or even full design templates based on a specific brief. This could potentially help junior designers gain more experience and help professionals explore different avenues within design that they may not have considered before.

N - Novelty

GenAI can introduce fresh ideas regarding visual content. It could combine design styles and concepts in ways that human designers may not think of. AI models could potentially remix visual styles from pop culture, art history or global trends into entirely new aesthetics.

Using this framework, we can evaluate the possible benefits that AI might have in the marketing arena, as well as the advantages to graphic designers using AI.

IV. EXPECTED RESULTS AND DISCUSSIONS

The expected results of this study is that there will be a substantial increase in consumer engagement due to the use of GenAI in graphic design. The results may expand our knowledge on how AI-generated graphics can improve customer engagement and will be consistent with previous research on GenAI, consumer psychology and graphic design. Since AI-driven content has the ability to pique customer's interests, it may cause significant ramifications for marketing tactics and designers. Future studies should analyse GenAI's ever changing role in consumer interaction, focusing on design innovation and marketing from a cross-cultural standpoint. This could provide a more nuanced understanding of customer reactions to GenAI.

V. CONCLUSION

This study concludes by evaluating the rising importance of GenAI in improving customer engagement using graphic design. The results highlight the need for AI integration in marketing and design methods by showing that GenAI has a positive influence in customer interaction. However, in order to preserve consumer trust, ethical concerns regarding AI-generated content, such as authenticity and possible biases, must be accounted for. It is predicted that GenAI will play a big role in marketing and design as it continues to develop, which could provide new opportunities for innovation. Businesses should take advantage of GenAI's promise to revolutionise customer interaction in the future by implementing it responsibly and creatively.

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