# AI VS. HUMAN DESIGNERS: EVALUATING THE EFFECTIVENESS OF AI-GENERATED VISUAL CONTENT IN DIGITAL MARKETING

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Abstract: In the rapidly evolving landscape of digital marketing, the quest for more effective and engaging visual content is relentless. With artificial intelligence (AI) making significant strides, an important question arises: Can AI tools for design surpass the creativity and effectiveness of human graphic designers? This intriguing inquiry forms the cornerstone of our study. We aimed to evaluate the effectiveness of Algenerated versus human-designed advertisements through a practical approach. In the first phase, both a human graphic designer and an AI tool were given identical tasks and prompts to create visual ad solutions. In the second phase, the efficiency of these designs was assessed using Meta's A/B testing solution for Facebook and Instagram ads. This method allows the testing of visual variables by showing different ad versions to segmented audiences, ensuring that no individual sees both versions and that the budget is evenly distributed. The test duration is recommended to be two weeks or until 100 conversions are collected. This experiment, conducted in August 2024 as part of a campaign for FTN Business School's 2024/2025 enrollment, aims to provide a comprehensive insight into the actual capabilities of graphic solutions created by human designers versus AI tools. The outcome of this test promises to offer valuable insights into the real-world performance of AI-generated designs compared to those crafted by human designers. Will AI tools emerge as the new maestros of design, or will the nuanced touch of human creativity prevail? Our research aims to shed light on this cutting-edge debate, providing data-driven conclusions.

**Key words:** Artificial Intelligence, Graphic Design, Digital Marketing, A/B Testing, Visual Content Effectiveness

### 1. INTRODUCTION

Although artificial intelligence (AI) has been present for decades and it is not considered a new discovery, the development of AI models and their integration with various applications in recent years have made AI more accessible to a broader audience. This growing accessibility has sparked increased interest in the potential applications of AI across different fields. Unsurprisingly, this trend has also reached the realm of graphic design.

The impact of AI in graphic design manifests in various areas, such as automating tasks for graphic designers, generating AI graphic designs, and providing AI tools for assistance in graphic design (Mustafa, 2023). On one hand, some authors express concern that AI will "deskill the profession and create a second tier of 'non-professional' designers, particularly within less creative work that emphasizes fast turnover and functional artifact production" (Meron, 2022). In contrast, other authors do not perceive AI as a threat, arguing that aspects defining our humanity-such as originality, creativity, and empathy-will remain areas where AI cannot compete with human designers (Tomić et al., 2023). While authors like Tomić et al. (2023) agree that AI tools will not replace human designers soon, this paper aims to explore the current capabilities of AI tools in autonomously creating graphic solutions. Additionally, we will compare the results achieved by Al-generated graphic designs in social media advertising with those produced by human graphic designers. Previous research (Dehman, 2023) has highlighted the limitations faced by AI tools in attempts to replace human designers, including challenges such as misunderstanding or failing to generate vector graphics, issues with positioning objects in 3D space in cases of non-standard perspectives, generating visual clichés, and the inability to produce text within graphic solutions. These authors suggest that graphic designers should utilize AI solutions like DALL-E and Midjourney for visualizing ideas during the ideation phase of the creative process. Research has also been conducted on the impact of AI graphic design tools on designers' creative thinking (Lin & Liu, 2024). The results indicated that these AI tools play a significant role in stimulating designers' creative thinking while also emphasizing the importance of understanding their advantages and limitations for successful integration into the creative process.

### 2. RESEARCH METHODS

The research was conducted in two phases. In the first phase, the same task was given to both the designer and AI tools using identical instructions, or prompts. The designer first used the AI tools, and on the second day, created the social media post from scratch, based on the brand guidelines. In the second phase, the effectiveness of the graphic solutions in digital marketing was tested using Meta's A/B testing tools for Facebook and Instagram ads.

#### 2.1 The first phase of research – AI designer

In the first phase of the research, the capabilities of various AI tools for designing social media posts were tested. Using the tool Chat GPT-40-mini, prompts for the AI tools were written. When testing the capabilities of the Midjourney v6.1 (Basic Plan) tool for creating posts, the result shown in Figure 1 was obtained. In this solution, besides the provided prompt, one graphic element from the brand book was included as an additional reference. What can be observed in these solutions is that this AI tool attempted to apply the references specified in the prompt, but was largely unsuccessful in reproducing the exact graphic solution. In the attempt to generate several iterations, it was noticed that this AI tool tries to modify the provided graphic elements, fails to apply the specified font, and has difficulty accurately applying the given text.



Figure 1: Examples of social media posts created with Midjourney v6.1

In the ChatGPT-4o-mini tool, the prompt was adapted for DALL-E, OpenAI's image generator. In this case, DALL-E produced a solution shown in Figure 2. From this example, it can be observed that DALL-E currently has more limited capabilities for generating social media posts compared to the Midjourney V6.1 tool. DALL-E generates visuals according to its own interpretation, disregards the specified color parameters and graphic elements, and is unable to accurately interpret the text in the image. Additionally, it tends to "invent" nonsensical text.



Figure 2: Social media post created with DALL-E by OpenAI

In the next step, it was attempted to find an AI tool specifically designed for creating social media posts. A Google search highlighted the tools SocialBee and Canva PRO. After signing up for the SocialBee platform, no tool for creating social media posts was found, despite being advertised. This tool is focused on applying AI technology in creating social media editorials and assisting with writing content. For this reason, it was

decided to use Canva PRO in the final version, along with a photo created using the Midjourney v6.1 tool. Figure 3 shows the photos that were created based on the given prompt.



A relaxed, casual setting featuring MBA students aged 35+, all Caucasian, interacting in a comfortable, modern workspace. The students are dressed in business casual attire, but their body language and expressions are...

Figure 3: Photos created with Midjourney v6.1

It could be observed that when additional variations were initiated, errors such as unnatural hands, wrists, legs, and feet were made by Midjourney v6.1. As presented in Figure 3, the first photo on the left was chosen for the social media post. This selected photo also shows flaws that occurred during image generation, but it was decided that this solution would be used to check whether any social media users would notice and report these defects after the ad is published.

In the next step, the final visual solution was created using Canva PRO. In its PRO version, Canva features Magic Design<sup>™</sup>, an AI tool for design. The PRO version of this tool also allows for the addition of Brand Kits, where, similar to brand guidelines, all elements of the brand's visual identity can be added – different logo variations, primary and secondary colors, fonts, photos, graphic elements, icons, as well as brand voice that can be used in the AI assistant for writing with Magic Write<sup>™</sup>. Based on the given prompt, the parameters from the Brand Kit, and the photo generated in Midjourney v6.1, the graphic solutions shown in Figures 4 and 5 were obtained.





Figure 4: Social media posts created with Canva PRO's Magic Design  $^{\rm TM}$ 

Figure 5: Social media posts created with Canva PRO's Magic Design<sup>TM</sup>

The next step required human intervention. From the proposed graphic solutions, it was necessary to choose one design. Since Canva PRO does not have the capability to automatically insert the specified text and logo into the proposed design, the designer replaced the placeholder text and logo in the selected solution. The chosen design is shown in Figure 6, while the final AI solution after the graphic designer's intervention is shown in Figure 7.



Figure 6: Social media post created with Canva PRO's Magic Design<sup>™</sup>



Figure 7: Social media post created with Canva PRO's Magic Design™ – edited by a graphic designer

#### 2.2 The first phase of research – Human designer

The next day, the graphic designer was assigned the task of creating a social media post. The task was given to him through instructions similar to the prompts written for AI tools. The graphic designer then familiarized himself with the graphic standards book and proceeded to produce the graphic solution. In creating the social media post, he used real photos available on stock photo websites and did not utilize AIassisted tools and options available in illustration and photo editing software. The final graphic solution, which was fully produced by the graphic designer, is shown in Figure 7.



Figure 8: Social media post created by a graphic designer

### 3. RESULTS

#### 3.1 The second phase of the study – Advertising A/B testing

In the second part of this study, the effectiveness of the proposed graphic solutions for social media advertising was evaluated using Meta's A/B testing solution. This method allows for the testing of visual variables by presenting different ad versions to segmented audiences, ensuring that no individual sees both versions and that the budget is evenly distributed. The recommended test duration is two weeks or until 100 conversions are achieved. The testing was conducted from September 7 to September 14 as part of the campaign for enrollment at FTN Business School for the 2024/2025 academic year. The test lasted for 7 days, having exceeded the required minimum of 100 conversions. Figure 8 shows examples of the ads displayed on the social media platform Facebook.



Figure 9: Ad solutions A and B as shown on Facebook

The A/B test in Facebook Ads Manager was set up with the graphic design as the test variable. Both versions of the test were configured with identical parameters, including the same budget, target audience, and

text accompanying the graphic design. The overall results of the advertising campaign are illustrated in Figure 8.

Ad set ↑ 🗸 🗸	<b>6</b> Results ▼	Cost per result	Reach 👻	Impressions -	Post engagements	Cost per post engagement	Link clicks	CTR (link click- through rate)	CPC (cost per link click)
🖁 Test_Al	762 Link Clicks	€0.07 Per link click	29,495	121,631	767	€0.07	762	0.63%	€0.07
A Test_HUMAN	756 Link Clicks	€0.07 Per link click	37,439	156,063	759	€0.07	756	0.48%	€0.07
Results from 2 ad	1,518 Link Clicks	€0.07 Per link click	<b>59,817</b> Accounts C	<b>277,694</b> Total	<b>1,526</b> Total	€0.07 Per Action	<b>1,518</b> Total	0.55% Per Impressions	<b>€0.07</b> Per Action



At the conclusion of the test, no winning solution was identified based on the key metric, Cost per Result. However, a top performer was determined according to two metrics: Cost per 1,000 Accounts Center accounts reached (Figure 9) and Cost per landing page view (Figure 10). Meta indicates that the confidence level of these results is at least 95%.

Test_HUMAN	Cost per 1,000 Accounts Centre accounts reached				
had the lowest Cost per 1,000 Accounts Centre accounts reached with €1.43.	Version A Test_Al				
View by Cost per result to find out if there was a winner from the test.	€1.81 Version B				
	Test_HUMAN				
	Cost per 1,000 Accounts Centre accounts reached				
	Results are based on a 7-day click or 1-day view attribution window 🜖				
Figure 11: A/B test winner based on the metric	: Cost per 1,000 Accounts Center accounts reached				
Test_HUMAN	Cost per landing page view				
had the lowest cost per landing page view with €0.13.	Version A				
View by Cost per result to find out if there was a winner from the test.	Test_AI €0.14				
	Version B				
	Test_HUMAN				
	Cost per landing page view				

Figure 12: A/B test winner based on the metric: Cost per landing page view

Results are based on a 7-day click or 1-day view attribution window ()

#### 4. DISCUSSION

When considering the overall advertising results, it is observed that both the AI and Human versions of the ad achieved comparable outcomes. Both versions yielded similar results in terms of link clicks to the website and incurred the same cost per click. Notably, the Human version of the ad reached more users-specifically, 7,944-with 34,432 more impressions. However, Meta's algorithm did not recognize these differences as statistically significant. Statistically significant differences were found in the parameters of Cost per 1,000 Accounts Center accounts reached and Cost per landing page view. Although these metrics were not selected as primary parameters, they are significant in the field of advertising, as it is important for advertisers to achieve the best possible results for the same budget. Additionally, it is important to note the time spent on producing these two ad solutions. Creating the AI version of the ad took approximately 6 hours, while producing the Human version of the ad took 30 minutes. It is crucial to recognize that, while we evaluated the effectiveness of graphic solutions created with AI tools versus those created by a graphic designer, the human influence in the production of AI-generated solutions cannot be disregarded. This small experiment demonstrates that current technological advancements do not yet allow AI to achieve

complete autonomy in creating social media content. Had we applied any of the graphic designs shown in Figures 1 and 2 in the A/B test without any graphic designer intervention, we believe that both the A/B test results and user feedback would have been markedly different. As previous studies have concluded (Dehman, 2023) artificial intelligence tools in graphic design can currently accelerate certain design processes and help designers focus on the creative aspects of their work.

## 5. CONCLUSIONS

The findings suggest that while current AI tools can support and expedite certain aspects of graphic design, they do not yet fully replace the nuanced and creative input of human designers. The results underscore the importance of integrating human expertise in the design process to ensure high-quality outputs and effective advertising strategies. Future research should continue to explore the evolving capabilities of AI in graphic design and assess how these tools can be further optimized to enhance their effectiveness and autonomy in content creation. In conclusion, AI tools hold promise for accelerating graphic design processes, but human involvement remains crucial for achieving optimal design outcomes. The study reinforces the need for ongoing evaluation of AI technologies in practical applications and highlights the continuing value of human creativity in digital marketing.

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