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A Study on Brand Design Methodology Using Generative AI

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Abstract

Recent advancements in artificial intelligence (AI) technology are creating new opportunities for evolving brand design methodologies. AI possesses the ability to analyze intricate data and propose innovative solutions that may be overlooked by human designers. In this light, this study seeks to investigate the development of brand design concepts in tandem with AI advancements and explore the potential of integrating Generative AI into brand design through practical workshop case studies. The researchers organized a rebranding workshop for 'Goubuli (狗不理),' a renowned Chinese snack brand, involving students in the use of AI technology to generate design concepts. This study examined how AI can be incorporated into brand design processes and the changing role of designers. The key findings revealed that while AI tools excel at rapid concept generation and creative ideation, they require significant human oversight for cultural sensitivity and brand alignment. The findings revealed both the effectiveness and limitations of AI in brand design, highlighting specific methodologies for its application. This research contributes practical guidelines for integrating AI tools into brand design workflows and provides a framework for balancing AI capabilities with human expertise in commercial design projects. It was found that AI-generated images have inherent stylistic and structural limitations, underscoring the ongoing necessity for human designers to refine and enhance AI-generated content.

Keywords: *Generative AI, Artificial Intelligence, Brand Design, Design Methodology*

1. INTRODUCTION

1.1 Research Background and Purpose

The advancement of artificial intelligence (AI) technology is presenting new possibilities in the field of design. AI has the capability to analyze complex data and offer creative solutions that humans might not consider. Specifically, logo-making AI and generative AI technologies have the potential to provide fast and efficient design solutions for brand design. These technologies help automate repetitive tasks and generate diverse design options, allowing designers to focus on more creative aspects of their work. The aim of this study is to explore how AI technology can be integrated into the brand design process. To achieve this, a rebranding workshop was conducted using AI technology for 'Goubuli (狗不理),' a prominent Chinese brand.

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Through case studies, this research investigates the feasibility of applying AI technology in brand design methodologies and explores the future role of brand designers. Additionally, the study evaluates the advantages and disadvantages of AI technology and confirms its potential to achieve effective outcomes in brand design methodologies, including logo creation and application design.

1.2 Scope of Study

This study focuses on exploring the brand design process using artificial intelligence (AI) by setting up a case study on the rebranding workshop for ′Goubuli’, a leading Chinese snack brand. Goubuli is a traditional Chinese snack brand with a high level of recognition not only within China but also globally. The scope of brand design covered in this study is based on David A. Aaker’s brand identity theory, focusing on the extension of brand identity through logo design, graphics, packaging, UI, and other application designs. Additionally, the primary AI technology applied in the design process is generative AI, with an emphasis on design platforms specialized in creating visual images.

1.3 Research Method

The research methods of this study are as follows. First, a literature review is conducted to understand the concept of brand identity and the AI technologies applicable to the brand design process. This includes comparing the differences, advantages, and disadvantages of generative AI and logo-making AI, aiming to explore the potential and limitations of AI platforms in contributing to brand identity development. Second, a rebranding workshop is held using generative AI technologies to analyze real-world applications of AI technology. The workshop focuses on the Chinese snack brand ‘Goubuli’ and explores how designers can use AI to rebrand various elements such as logos, patterns, and packaging. Finally, based on the literature review and the analysis of the workshop case study, the study proposes a collaborative model between AI and human designers in the evolving brand design environment and seeks to establish a new paradigm for brand design methods in the age of AI.

2. Theatrical Background

2.1 The Concept of Brand Identity Design

A brand encompasses the expressions used to clarify the products and services offered by a seller and to differentiate them from competitors. This includes elements such as names, terms, symbols, and designs. The concept of a brand can be understood as encompassing brand names, brand symbols, and trademarks, and it is distinct from Corporate Identity (C.I), which pertains to the identity of a company. Brand expert Alina Wheeler defines brand identity as "the visual expression of a brand" and "a comprehensive program for maximizing communication effectiveness" [1]. This concept is further detailed and subdivided into what is known as the 'Brand Identity System.' Brand expert David A. Aaker describes this system as "a set of elements for creating and maintaining the desired brand image for a company," distinguishing between Core Brand Identity and Extended Brand Identity. Core Brand Identity includes the brand’s essence, name, slogan, promotion, values, and organizational symbols, while Extended Brand Identity encompasses elements such as logos, advertisements, products, and characters. These elements must maintain the concept and consistency of the brand while enhancing relationships and addressing weaknesses to create synergy [2].

2.2 Generative AI Platforms Applicable to Brand Design

Image-generating AI platforms are based on the deep learning structure of Generative Adversarial Networks (GANs), where users input text and the AI generates images through a generative-interpreting cycle. The most representative image-generating programs currently used in the design field are as follows:

(1) DALL·E

DALL·E is a generative image AI released by OpenAI in January 2021 that, like ChatGPT, creates images from natural language inputs. On the DALL·E platform, users can input English text or image files, and the AI will automatically generate illustrations. Additionally, the platform offers features for editing images or inserting new images to modify them. Notably, DALL·E provides a function where users can erase parts of a photo and input text to generate a realistic and seamlessly integrated image for the erased area [3]. DALL·E excels in producing photorealistic images and accurately interpreting complex text prompts. Its particular strength lies in understanding contextual relationships and maintaining consistent visual styles across multiple generations, which proved valuable for maintaining brand consistency in our rebranding process.

(2) Stable Diffusion

Stable Diffusion is an open-source AI model released by Stability AI in August 2022. This deep learning-based text-to-image model generates images based on text or keywords. The platform can be used on personal computers without requiring cloud services [4]. Its unique advantage lies in its customizability and the ability to fine-tune parameters for precise control over artistic styles. During our study, Stable Diffusion's strength in generating diverse artistic interpretations and its capability to process high-resolution outputs made it particularly useful for exploring various brand identity directions.

(3) Midjourney

Midjourney is an AI software launched in July 2022 by the research lab of the same name. It is available through the gaming messenger Discord, where users can request image generation and share results for feedback on Discord channels. Midjourney is notable for allowing users to adjust style, mood, and composition through detailed prompts, resulting in a variety of visual outcomes [5]. What distinguishes Midjourney is its superior handling of artistic and abstract concepts, along with its intuitive version parameter system that allows for rapid iteration of designs. In our rebranding workshop, Midjourney's ability to generate stylized, imaginative interpretations of brand elements proved especially valuable for conceptual exploration and creative ideation.

These platforms, while sharing basic text-to-image capabilities, offer distinct advantages for different aspects of brand design. DALL·E's photorealistic outputs are ideal for mockups and final presentations, Stable Diffusion's customizability suits detailed refinement of brand elements, and Midjourney's artistic interpretation capabilities excel in initial creative exploration. Understanding these distinctions allowed us to strategically employ each tool at different stages of the rebranding process.

Table 1. Generative AI Platforms for Brand Design

	Dall-E	Stable Diffusion	Midjourney
Year	2021	202	2022
Founder	OpenAI	Stable AI	Midjourney
Process	Prompt>Image	txt2img) Prompts>Images	Install Discord > /imagine>

		img2img) Image + Prompt > Image	Enter Prompt > Create Image
Function	Replace and add images, adjust color and tone, adjust size and layout, synthesize and combine, apply style	Create, edit, remove, modify images from images	Image creation from images, image extensions (U1 to U4) and variations (V1 to V4), Image control with parameters
Feature	Specialized for realistic images	Available on user's computer without a separate program	Control the details of an image with parameter values

2.3 Applicability and Limitations of AI platforms

Deep learning-based generative AI can address the limitations of traditional logo generators by creating images that more accurately reflect user intentions. Generative AI allows designers to input text descriptions or add reference images to achieve more precise results, and it also enables direct editing and adjustment of design drafts, such as modifying parts of an image or filling in backgrounds [6]. Additionally, generative AI can produce a range of application designs, including graphics, patterns, packaging, and interiors, based on specific text descriptions of the brand image [7]. In other words, generative AI can actively create suitable images that align with the designer's vision through detailed descriptions, making it a valuable tool for brand creation, including logo design and application design. However, generative AI requires users to write keywords themselves and has a relatively complex interface and text input method, which may lower accessibility for users unfamiliar with the program. Furthermore, the process of repeatedly entering and refining text to achieve satisfactory results can lead to longer work times compared to logo-generating AI. Therefore, to efficiently create brand designs using AI, it is important to select and use the most appropriate program for the type of design and medium rather than relying solely on a specific AI platform.

3. Brand Design Methodology Based on Generative AI

To experiment with brand design methodologies using artificial intelligence, the researchers conducted a rebranding workshop with fourth-year undergraduate students from a university in southern China's <Brand Package Design Course> from November 13 to December 21, 2023. The workshop focused on 'Goubuli' (狗不理), a traditional snack brand from Tianjin with a history of approximately 150 years. Goubuli is listed as a national-level intangible cultural heritage and is rapidly rising as an internationally renowned snack brand with exports to various countries [8].

3.1 Core brand identity analysis and logo design

First, a research and analysis process was conducted to extract the core brand identity design concept and philosophy of Goubuli. Initially, the researchers used a data crawling AI program and large language models (LLMs) such as ChatGPT to automatically collect articles, data, and documents related to the Goubuli brand from the internet. The data collection focused on three primary sources: Chinese social media platforms including Weibo and WeChat (approximately 300 user comments and reviews), traditional media coverage from the past decade (over 50 news articles), and historical documents about the brand's 150-year heritage (including archived advertisements and marketing materials). The collected dataset comprised approximately 100,000 words of text in both Chinese and English. The collected articles were then analyzed using a text mining AI program to extract commonly repeated keywords. The text analysis revealed several significant patterns: terms related to tradition and heritage appeared in 68% of the content, references to craftsmanship

occurred in 45%, and customer experience-related terms appeared in 37%. The AI analysis also identified semantic clusters showing strong associations between 'handmade tradition' and 'premium quality' (correlation coefficient 0.72). Based on these keywords, the researchers established the brand concepts of ‘Elegant,’ ‘Lively,’ and ‘Classic’ through brainstorming sessions. These concepts were directly derived from the data: 'Elegant' emerged from the premium positioning in consumer perceptions, 'Lively' from the brand's dynamic presence in modern Chinese culture, and 'Classic' from its historical significance. Visual symbols related to the concepts, such as ‘Dumpling’ and ‘Steamer,’ were selected as motifs to quickly generate initial design ideas. The designers then used the generative AI tool Midjourney to create logos by entering precise prompts. The researchers and students divided the process of entering prompts into generative AI into four stages. First, they input only the topic; second, they provided a description of the topic; third, they detailed the style; and finally, they inserted reference images to generate the image. Figure 1 shows the results from each stage of the prompt process. As illustrated, more detailed prompts and the inclusion of reference images lead to more accurate logo images.

Subject	Subject description	Style detail	Image Reference
Logo of an steamed stuffed bun restaurant	Logo of an steamed stuffed bun restaurant, **a bun on top of a steamer, red flat lines, white background**	Logo of an upscale baozi restaurant with buns emitting heat on top of a steamer, **Chinese style, simple, flat, minimalist, flat lines, --no shading detail photo realistic colors outline**	**https://s.mj.run/stQ_UVcoGTo** Logo of an steamed stuffed bun restaurant with buns emitting heat on top of a st eamer, Chinese style, simple, flat, mini malist, red flat lines, white backgroun d --s 50 --v 5.2 -

Figure 1. Image extraction process of generative AI according to the prompt

Lastly, The final selected logo was then refined by the designer to adjust colors and add suitable fonts to match the brand concept. The image sources obtained from the generative AI were deconstructed and recombined by the designer to create a new logo image. Figure 2 shows the final logo design result after editing and modifying the drafts generated by the generative AI.

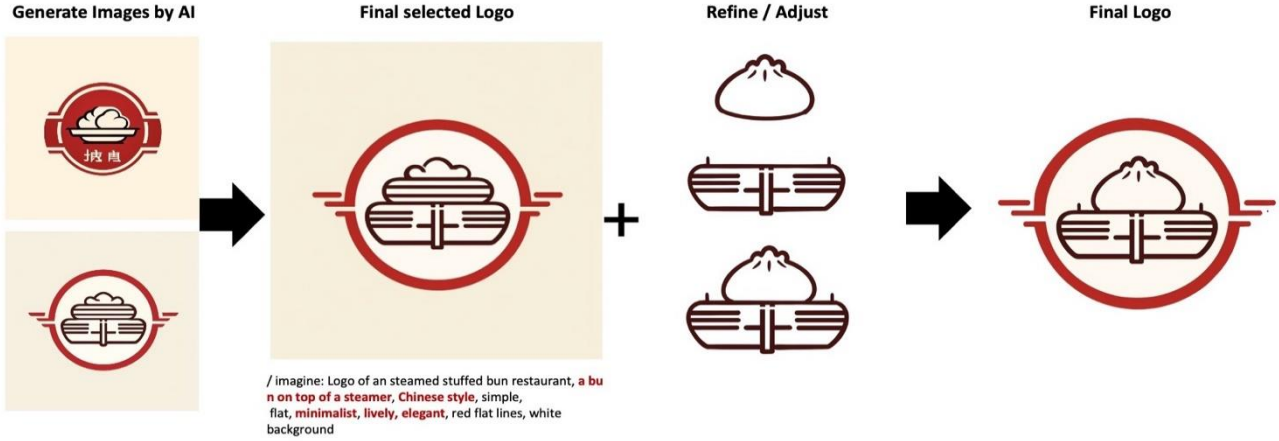

Figure 2. The Refine Process of Logos through Generative Images

To achieve the desired outcomes through generative AI prompts, it is essential for designers to derive keywords that effectively represent the brand through thorough research and express these keywords in refined language. The process also involves selecting suitable logos from the generated images and re-editing them to align with the brand's goals and concepts.

3.2 Brand Graphic Motif Design

Brand graphic motif images refer to the graphic designs (or patterns) attached to emphasize the logo mark's image. These motif images are used to create coherence and unity in the work or to convey specific messages or themes [9]. In traditional brand design processes, designers would typically repeat the logo as a small pattern or create graphic images similar to the logo based on a specific theme. However, with generative AI, it is possible to efficiently create initial design drafts that meet the intended objectives by entering prompts or inserting idea sketches. For example, by entering the prompt "Plump bun, pattern print, Chinese style, simple, flat, minimalist, lively, elegant, red flat lines, white background --tile --s 50 --v 5.2 -" into Midjourney, a pattern design that fits the brand concept can be generated. After selecting a suitable design, the designer can then modify and edit it to create a repeated pattern. Figure 3 shows the final completed pattern design after generating graphic images with AI and subsequent re-editing by the designer.

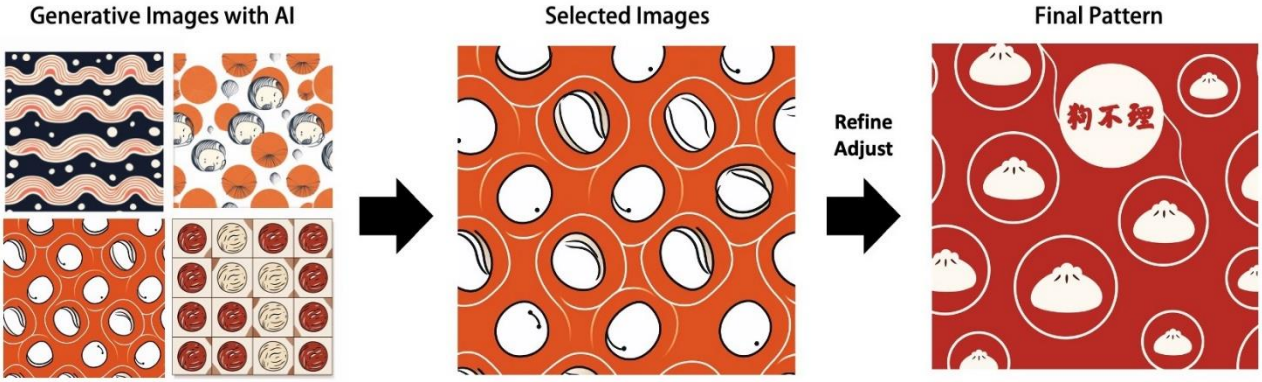

Figure 3. Pattern design process with generative AI

The designer then selects appropriate drafts, revises and re-edits them, and adds text to produce the final graphic image. This method of using AI not only shortens the time needed to create graphic motifs but also serves as a source of inspiration for designers. In the AI era, the role of designers involves selecting images (curation) through AI, crafting effective prompts, and fine-tuning the images (post-curation), thus requiring designers to act as image curators who accurately grasp brand strategies [10].

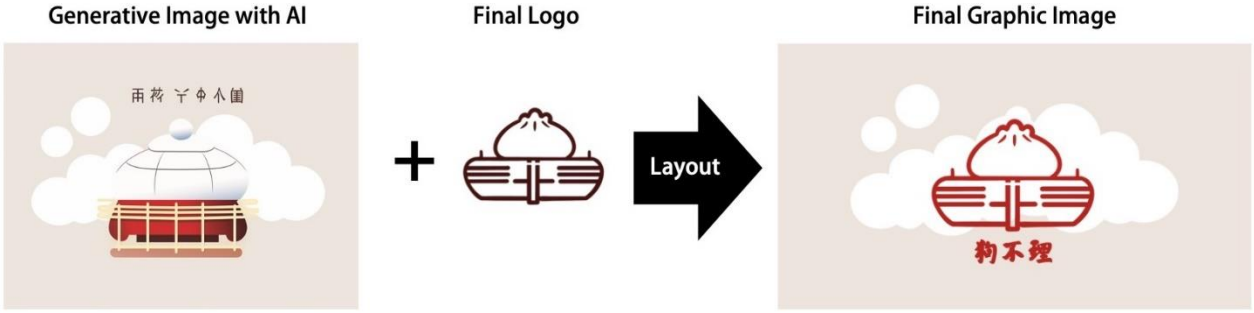

Figure 4. Graphic design process with generative AI

3.3 Brand Application Design

Application design encompasses the extension of brand identity systems beyond the logo, including areas such as posters, advertisements, characters, interiors, and package design [11]. This type of design can be approached in two main ways: directly applying the logo or indirectly applying the logo's colors, shapes, and consistent design elements. It is necessary to explore methods for creating diverse styles of images using generative AI. For instance, various generative AI programs like Midjourney allow users to upload reference images or logo files to generate images that align with the brand's identity. Through specific prompts, users can create diverse design elements such as characters, user interfaces (UIs), packages, and interiors. Additionally, if a particular mockup image is needed, users can input prompts specifying materials, colors, angles, and styles to generate appropriate mockup images. Figure 5 shows the results of using generative AI to create image motifs and modify images for package and UI design.

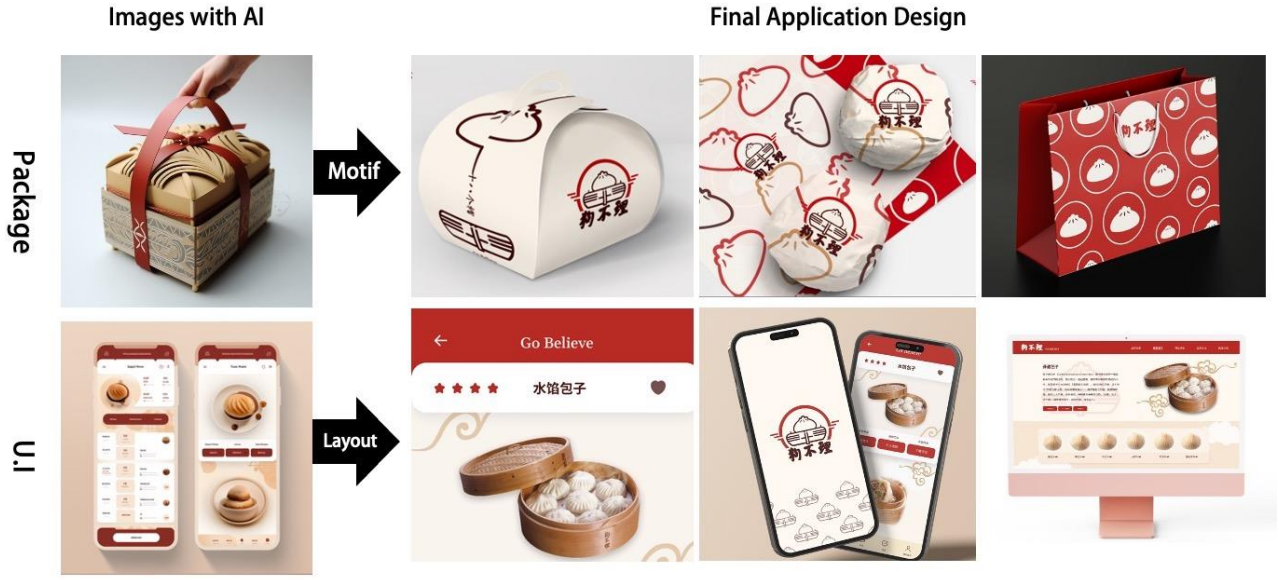

Figure 5. Application design process with generative AI

However, after generating application designs through AI platforms, it is essential for designers to revise and re-edit these designs. In particular, with Midjourney, technical limitations may prevent the complete and accurate incorporation of the user's text prompts, which can result in outcomes that do not fully align with the user's intentions. Therefore, designers need to adjust layouts, select fonts, and combine additional images to complete the application designs while considering the brand concept. For instance, designers can integrate previously completed graphic images into the package design generated by generative AI or insert product photos. Additionally, they can use the UI design formats suggested by AI as references to modify content or change layouts to create the final UI mockups.

3.4 Evaluation of AI-Generated Brand Design

The evaluation compared two main approaches: non-AI designs (including student-generated logos in Stage 1 and comprehensive brand designs in Stage 2) and AI-assisted designs (including AI-generated logos in Stage 3 and complete brand identity designs in Stage 4), allowing for systematic comparison across different design scopes. The evaluation criteria for brand design were established based on three key dimensions identified in previous brand identity research: traditional heritage, modern appeal, and cultural authenticity [12, 13]. These criteria align with Zhao et al.'s (2024) framework for evaluating cultural brand identity [12] and incorporate

contemporary design assessment methods proposed by Zali et al. (2014) [13]. Traditional heritage evaluates how well the design preserves and reflects historical brand values, modern appeal assesses the design's contemporary relevance and aesthetic appeal, and cultural authenticity examines the appropriate representation of cultural elements [14].

To systematically evaluate the effectiveness of the AI-generated designs, we implemented a Brand Identity Alignment Matrix (BIAM). Three evaluators - two design professors and one professional brand designer, each with over 10 years of experience in the field - assessed the designs using a 5-point scale across these attributes. The evaluation process revealed that AI-assisted designs consistently outperformed non-AI designs, with Stage 4 achieving the highest average score of 4.5. The most significant improvement was observed in modern appeal, where AI-assisted designs scored approximately 1.0 points higher than traditional student work. While student-generated designs showed competent results (averaging 3.3-3.5), the integration of AI tools notably enhanced the design outcomes, particularly in balancing traditional elements with contemporary aesthetics. This comparative analysis demonstrates that AI assistance can significantly improve design quality while maintaining cultural authenticity.

Table 2. Brand Identity Alignment Matrix (BIAM) Evaluation Results

Design Stage	Traditional Heritage	Modern Appeal	Cultural Authenticity	Average Score
Non-AI Logo Design	3.2	3.5	3.3	3.3
Non-AI Brand Design	3.4	3.6	3.5	3.5
AI-Assisted Logo Design	4.2	4.5	4.1	4.3
AI-Assisted Brand Design	4.5	4.6	4.3	4.5

*Note: Scores are averaged from three evaluators (two design professors and one professional brand designer) using a 5-point scale where 1 = Poor alignment, 3 = Moderate alignment, and 5 = Excellent alignment with brand attributes.

The workflow begins with research and analysis utilizing AI for data collection and keyword extraction, followed by the design development phase where AI assists in generating logos, motifs, and patterns. The final phase involves application design including package design, with continuous designer refinement throughout the process. This AI-integrated brand design process with its step-by-step progression is illustrated in Figure 6 as a comprehensive workflow.

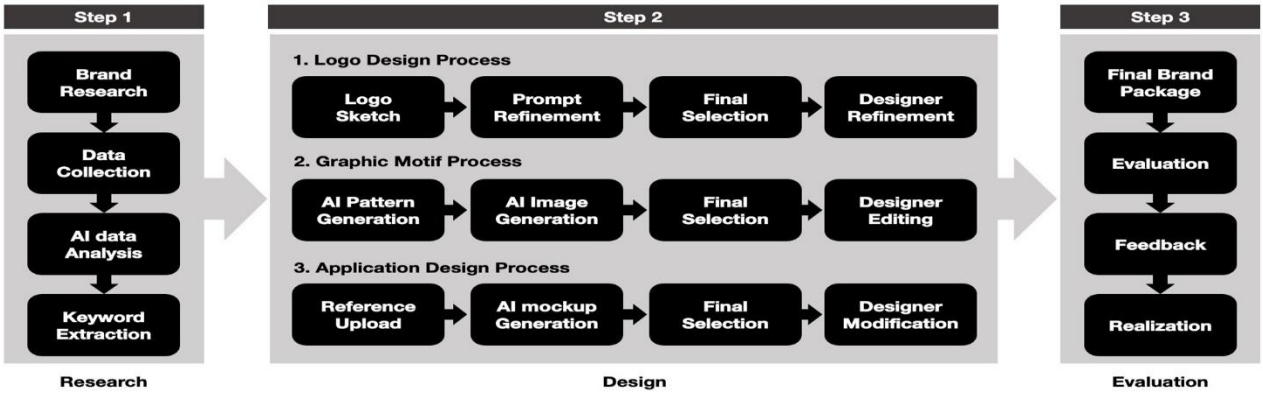

Figure 6. AI-Integrated Brand Design Workflow

4. Discussion

In traditional brand design processes, logo design and application design are typically handled separately, which can be time-consuming for each phase. However, in brand design methods utilizing artificial intelligence, these stages can be conducted simultaneously, improving design efficiency and effectively establishing a cohesive brand identity [15]. In particular, image-generation AIs like Midjourney and DALL·E produce the desired images as the specificity of the keywords and parameters increases. Designers can easily visualize ideas through the process of describing keywords and inserting reference images, and the finalized drafts are then refined, edited, and enhanced by the designers to complete the logo [16]. Additionally, during the application design phase, generative AI can be used to create specific mockups by inserting keywords related to angles, colors, materials, etc., and blending them to produce package designs, UI designs, and interior designs that align with the brand concept. However, there are several limitations to effectively applying this AI technology in the brand design process. In our case study of the Goubuli brand design process, we found that when designers input general prompts like "traditional Chinese dumpling brand" without specific cultural elements, the AI generated generic Asian-style imagery that lacked Goubuli's distinctive cultural heritage. Only when precise prompts including "Tianjin style baozi, established 1858" were used did the outcomes align with the brand's identity. Furthermore, the AI showed particular weakness in handling Chinese characters in logo design. When attempting to integrate "狗不理" into designs, many initial attempts resulted in incorrectly rendered or distorted characters, requiring substantial post-processing work by designers. Analysis of AI-generated designs also revealed copyright concerns, with several designs containing elements visually similar to existing brand designs in the Chinese food industry. This is particularly problematic given that current international copyright laws do not recognize AI as a rights holder [17]. The case study also identified technical limitations in maintaining consistent brand elements across multiple applications and preserving design integrity at different scales [18]. Currently, there are no specific legal frameworks for image copyrights related to AI, and domestic and international copyright laws do not recognize non-human entities as copyright holders. Particularly, there is a lack of discourse on copyright related to logos and brand designs. However, it is hoped that future data accumulation by users and discussions on the copyright of AI-generated art will address these issues.

5. Conclusion

To evaluate the effectiveness of generative AI in the field of brand design, the researchers conducted a rebranding workshop for "Goubuli," a representative snack brand from China. As a result, they were able to generate a variety of logos and related brand graphic motifs through AI and quickly extract diverse application design outcomes such as interior design, packaging, and UI design. Additionally, creating a high-quality brand identity required human designers to re-edit and refine the AI-generated images, and selecting appropriate images was also identified as an important role for brand designers. This study demonstrates that AI can not only significantly reduce the time required for creating brand design drafts but also serve as a tool for inspiring designers. The significance of this research lies in its experimentation with methodologies for brand design using AI and in proposing a collaborative model between humans and AI. However, a limitation of this study is that it has not yet been extended to practical applications beyond the classroom workshop. Future research will explore the potential of AI in the brand design creation process through expert interviews and surveys in real-world work environments, aiming to propose ways in which AI can support and innovate design tasks in the future field of brand design.

REFERENCES

[1] Wheeler, Alina., *Designing Brand Identity: an Essential Guide for the Whole Branding Team*, Wiley, 2012.
[2] Aaker, David A., *Building Strong Brands: What is a Strong Brand?*, The Free Press, p.79, 1996.
[3] DALL·E 3 *https://openai.com/index/dall-e-3/*
[4] Stability AI *https://stability.ai/*
[5] Midjourney *https://www.midjourney.com/*
[6] Y.J. Hwang, "A Study on the Use of Generative Artificial Intelligence Design Platform for BI Development," *The Korean Society of Design Culture*, Vol. 29, No. 3, pp. 527-541, 2023.
[7] C.J. Seon and S.B. Park, "A Study of an Online Logo Design Making Platform," *Archives of Design Research*, Vol. 32, No. 1, pp.101-112, 2019.
[8] Wang DeSheng, W. D., Yang WenBing, Y. W., Su Hui, S. H., Mao LuXia, M. L., Hou Qiang, H. Q., and Wang Yue, W. Y., *Process study on fresh-keeping goubuli stuffed bun with biological gas modified atmosphere*, Tianjin Food Research Institute Co. Ltd, 2012.
[9] Buschgens, M., Figueiredo, B., & Rahman, K., "How brand visual aesthetics foster a transnational imagined community," *European Journal of Marketing*, Vol.53, No.11, pp.2268-2292, 2019.
[10] Mazzone, M., & Elgammal, A., "Art, creativity, and the potential of artificial intelligence," *Arts(MDPI)*, Vol.8, No.1, p. 26, 2019.
[11] Aaker, David A., Op.cit., p.119.
[12] Zhao, J., Bao, Q., Wei, K., & Jung, E., "Evaluation of the Performance and Sustainability of Historical Cultural Symbols in Xuzhou's City Brand Based on Grey System Theory and Fuzzy Evaluation Method," *Sustainability*, Vol.16, No.23, pp.10528, 2024.
[13] Zali, N., Zamani-Poor, M., & Arghash, A., "Analyzing the identity aspect of Cultural Heritage of Isfahan City from the viewpoint of visitors with the Aim of City Branding," *Anuario do Instituto de Geociencias*, Vol.37, No.2, pp.206-215, 2014.
[14] Shanshan, Z., "Bridging Tradition and Innovation: Integrating Traditional Handicraft into Art Design Education," *Zibaldone Estudios Italianos*, Vol.11, No.1, pp.261-269, 2024.
[15] H.Y. Park, "The Possibilities and Limitations of Generative AI Image Conversion Tools and Their Implications for Design Education," *THE JOURNAL OF KOREAN ASSOCIATION OF COMPUTER EDUCATION*, Vol. 26, No. 5, pp. 155-170, 2023.
[16] Y.J. Hwang, "The Usage of Generative AI in Poster Design," *Archives of Design Research*, Vol. 36, No. 4, pp. 291-308, 2023.
[17] Lucchi, N., "ChatGPT: a case study on copyright challenges for generative artificial intelligence systems," *European Journal of Risk Regulation*, 1-23, 2023.
[18] B.R. Lee, "Case Study of AI-Generated Logo Design: Focusing on Design Thinking Museum Logo Design," *Journal of Business Convergence*, Vol. 8, No. 5, pp. 85-92, 2023.