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Intelligent Tools and Visual Expression: How AI Reshapes the Application of Illustration

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Abstract: The development of digital technology has driven a structural transformation in the illustration creation ecosystem, and AI-generated illustration tools have become an key auxiliary support for illustration creation. According to relevant data, with an estimated compound annual growth rate of 10.3% from 2026 to 2032, the global AI image generation market (illustration segment) reached 7.526 billion US dollars in 2025, the regular utilization rate of AI tools among Chinese professional illustrators is 68%, and the AI application rate for creative projects of design enterprises above designated size is 66.2%. This article relies on authentic industry data to explore the technical characteristics, innovations in visual representation, and commercial application scenarios of AI illustration, and analyze the dual impacts and developmental trends of AI technology on the illustration industry. This study shows that AI technology optimizes the illustration creation process, broadens the boundaries of visual representation, but also raises issues such as copyright definition and industry restructuring. The research aims to clarify the collaborative mode between intelligent tools and human creation, provide feasible ideas for the digital transformation of the illustration industry, and promote AI technology to assist in the innovation of visual representation in illustration in a compliant and orderly manner.

Keywords: AI-generated illustration; Illustration creation; Visual Representation; Intelligent tools; Digital Art.

1. Introduction

Illustration, as an important carrier of visual communication, has a wide range of applications in various fields such as publishing, advertising, gaming, and cultural and creative industries. Traditional illustration creation relies heavily on the artist's hand drawing skills and industry practical experience, and generally has limitations such as long creation cycles, high labor costs, and slow style iteration. Since 2022, AI-generated illustration tools such as Stable Diffusion and Midjourney have gradually been promoted and applied. By 2024, the number of active AI art creators worldwide has exceeded 15 million, and the scale of domestic generative AI art users has reached 250 million. The illustration industry has entered the stage of intelligent creation development. AI-generated illustration tools can efficiently complete the creative process of text-to-image conversion, style transfer, and line drawing coloring, greatly reducing the production cycle of commercial illustration projects. The average project time can be shortened by 60%–70%, and the comprehensive production cost can be reduced by 40% to 50%. At the same time, they break through the constraints of traditional painting techniques, achieve the integration of diverse artistic styles and the visual presentation of abstract concepts, and broaden the dimensions of illustration visual representation [1].

The rapid implementation of AI-generated illustration technology has also raised critical challenges such as vague definition of training data copyright, weakened originality of works, and adjustment of industry job structure. According to industry research, 87% of illustration practitioners perceive the actual impact of AI technology on their career development, and 62% of practitioners call for the establishment of a sound AI training data copyright authorization and protection system. According to data from Zhilian Recruitment, the demand for game art positions decreased by 58% year-on-year in 2023, while the number of AI training and AI art related positions will increase by 320% year-on-year. The penetration rates of AI-generated illustration in the fields of marketing advertising, e-commerce visual, and game art are 28%, 18%, and 12%, respectively, highlighting the continuous trend of digital transformation in the industry. This article conducts research based on the development reality of the illustration industry, sorts out the application logic and visual innovation forms of AI technology empowering illustration creation, analyzes the industry impact of technology application, and explores a reasonable path for the coordinated development of intelligent tools and illustration art.

2. The Technical Foundation and Core Functions of AI Illustration Tools

The AI illustration technology has deep learning as the basis of its development. It uses diffusion models, Generative Adversarial Networks (GANs) and multimodal algorithms to produce and optimize images into a unified technical process that combines text recognition, image creation, and optimization of details [2]. The current popular AI illustration platforms on the market are divided into three major groups: firstly, web-based online generation platforms like Midjourney and DALL·E 3; secondly, open-source platforms with local deployment support, such as Stable Diffusion and Flux; and thirdly, professional illustration support platforms aimed at creators, such as Copainter and Procreate Dreams. According to market application data in 2025, the Stable Diffusion ecosystem holds a 45% share in the AI illustration tool market, and Midjourney has over 15 million global subscribers. These two tools are currently the core products with high application levels in the industry.

The core functions of AI illustration tools can cover all aspects of illustration creation. The text-to-image function can quickly generate various styles of illustration works based on natural language descriptions. The creation time of

complex scenes is reduced from traditional hand-drawn days to minutes, and the image generation accuracy remains above 75%. The style transfer and integration function can restore hundreds of mainstream illustration styles, such as ink and wash, Cyberpunk, anime, and can also integrate elements of different styles to meet the visual creation needs of diverse scenes [3]. The auxiliary creation optimization function includes line drawing coloring, sketch refinement, local redrawing, color correction, etc., which can effectively reduce the difficulty of hand drawn creation. The Copainter tool can complete the transfer and basic coloring of line drawings in 1 minute. The batch standardization generation function is suitable for scenarios with high demand for illustrations and unified style requirements such as e-commerce and children's books, which can reduce the creation cost by 60%–80% compared to traditional hand drawing.

At present, technological iterations mainly focus on optimizing details and creating controllability. New generation models such as Flux have improved the problem of distortion in character structure and hand details in AI illustrations, increasing the accuracy of hand generation to 92%. The continuous upgrading of multimodal fusion technology enables AI to interpret abstract emotional concepts such as "broken romance" and "homesickness", and thus achieve more emotional visual representation. AI tools, with their high efficiency, diverse styles, and low threshold for use, have become an indispensable supporting tool for illustration creation in the illustration creation process.

3. Innovative Features of AI Empowered Illustration Visual Representation

The intervention of AI technology has broken through the inherent boundaries of traditional illustration techniques, styles, and expressions, forming a new visual innovation system and reshaping the visual representation language of illustration. Traditional illustrations are mostly limited by the creator's hand drawing skills and personal style, resulting in a relatively single and fixed visual presentation. However, AI-generated illustration tools can achieve cross-border integration of different artistic styles, combining ink painting imagery with cyberpunk, Dunhuang mural elements, and science fiction visual elements to create composite style works that are difficult to complete with traditional hand drawing. According to Adobe's "2025 Global Creative Trends Report", over 60% of brands have adopted a variety of styles and blended illustration forms in their marketing design to meet the current market demand for personalized and diversified visual effects.

AI relies on massive compliant image data for training, which can accurately depict details such as texture, light and shadow, and material. It can simultaneously present hundreds of visual elements in complex scenes, and the overall hierarchy is clear and orderly. The Omni-Reference feature of Midjourney can achieve a reproduction rate of over 90% for the facial features, equipment texture, and lighting effects of characters, which is significantly better than traditional hand drawing. At the same time, AI can also transform abstract concepts such as time flow and emotional temperature into intuitive visual symbols [4]. Currently, most open access journals recognize visual illustrations generated by AI, only requiring creators to provide complete generation logs and data explanations.

AI can also analyze mainstream aesthetic trends through big data, automatically match appropriate color combinations and composition methods, and enhance the visual coordination and commercial dissemination of illustrations. Some AI tools also support converting static illustrations into dynamic effects and generating 3D structures from 2D images, making them more suitable for the dissemination scenarios of new media. Shanghai Jiao Tong University, Shandong Academy of Arts and Crafts and other universities have incorporated AI visual tools into their design courses, focusing on strengthening the teaching practice of dynamic visual representation in combination with industry practice and teaching reform needs, to help students adapt to the design and creative requirements of the digital age.

AI is no longer limited to its role as a tool for assisting painting, but has become an important support for expanding creativity in illustration creation, continuously promoting the development of illustration visual representation towards diversification, refinement, and emotionalization, expanding the boundaries of visual art creation [5].

4. The Application Scenarios and Practical Value of AI Illustration in the Business Field

AI illustration, with its dual advantages of efficiency and cost control, has been widely applied in various commercial scenarios, promoting continuous optimization of production models in related industries and delivering tangible value to related industries [6]. As the core application scenario of AI illustration in the publishing field, publications such as children's books, picture books, and textbooks have a large and standardized demand for illustrations. AI tools can complete unified style illustration production in batches, effectively adapting to the production characteristics of the industry. Traditional picture book illustration is known for its long production cycle and high labor and production costs. By contrast, AI illustration technology can greatly shorten creation time and lower overall expenses, offering a practical way for the publishing industry to cut costs and boost efficiency. As of 2025, more than half of Chinese children’s publishing houses have adopted AI illustrations, and many educational software programs have also integrated AI-generated visual assets into courseware development. In addition, the technology can be used for the visual restoration of ancient books and the reproduction of illustrations for classic literature. It not only preserves the style of traditional art but also reduces the difficulty and cost of such projects

.In advertising and marketing, AI illustration tools can quickly design posters, product packaging, and promotional graphics tailored to brand requirements, earning wide recognition from brands for their high efficiency. The e-commerce industry utilizes AI to generate product illustrations and detail page illustrations in bulk, significantly improving the efficiency of visual content updates while effectively controlling design costs [7]. In the field of new media, AI tools are used to lower the threshold for visual content creation, providing image and cover design support for various content carriers.

The gaming and film industries have applied AI illustration to character design, scene concept design, and storyboard drawing. The penetration rate of AI technology in domestic game art creation is already at a high level, which not only effectively shortens the game development cycle, but also

optimizes the workflow of visual planning in the early stage of film and television. In the development of cultural and creative IP, AI can complete IP image and derivative illustration design, expanding the commercial monetization space for creators.

Cost control and efficiency improvement are the core values of AI illustration commercial applications, and copyright compliance is an important prerequisite for its market-oriented promotion. By 2025, over 60% of enterprises prioritized the copyright authorization of training data when choosing AI tools, in order to avoid copyright risks in commercial applications and ensure the compliance and orderly progress of related businesses.

5. The Dual Impact of AI Technology on The Ecosystem of The Illustration Industry

The popularization of AI technology has brought efficiency innovation to the illustration industry, and has also deeply restructured the industry ecosystem, bringing both opportunities and challenges to the sector for the development of the industry. AI has significantly lowered the professional threshold for illustration creation, and ordinary creators can also use tools to produce high-quality visual works. More than 15 million users worldwide participate in AI art creation at least once a month, effectively expanding the industry's creative community. Traditional illustrators can only complete 5-8 commercial illustrations per month, but with the help of AI tools, the creative output can be increased to 30-50, and the overall production efficiency of the industry can be increased by more than three times [8]. AI has also given rise to emerging positions such as AI illustrators and prompt engineers, with a growth rate of over 300% for prompt word engineer positions by 2025. In addition, AI illustration reduces the production cost of visual content and helps popularize art. 86% of creators worldwide use AI to carry out personal creative practices.

The practical challenges in industry development are also worth paying attention to. Copyright disputes are currently the most prominent issue, with 70% of professional illustration creators dissatisfied with the vague definition of AI training data copyright, and some models using original works without authorization, posing a risk of infringement. According to industry research in Japan, 92.8% of illustrators hope to clarify the copyright ownership of training data through legislation, and 12% of creators indicate that their income is directly impacted by AI technology. There have also been changes in the employment structure of the industry, and junior illustrator positions have experienced the greatest change [9]. In 2025, total global demand in the illustration jobs decreased to -33 percent, and entry-level jobs shrank by over 30 percent, whereas demand in the middle and higher levels of employment focused on independent creative labor was relatively consistent. The excessive dependence of the industry on AI-generated material has additionally undermined the originality of the works; the theme repetition rate among new artists has hit 38% which is noticeable especially in the area of commercial illustration. AI-generated artwork is generally aimed at the mainstream taste, and does not have the unique personal expression and humanistic richness found in professional art making, which in part impedes the development of the aesthetic level of the industry as a whole.

Under these two pressures, the illustration industry has begun a period of rapid structural differentiation. Professional illustrators are turning more and more to AI as a form of collaboration, shifting their efforts into more critical connections like creative conception, controlling the style, and fine-tuning. Commercial creative organizations have slowly created an AI-human hybrid workflow in order to balance both the productivity rate and artistic value. The illustration industry is slowly leaving behind the conventional paradigm of hand drawings and moving towards a new paradigm that is based on intelligent tools and creative innovativeness.

6. The Development Trend and Optimization Path of AI Illustration

Due to the demands of practical implementation of the illustration industry and the constant growth of artificial intelligence, it is predicted that AI illustration will become more technically advanced, more sophisticated in terms of scenario use and a normalized industrial ecosystem. The industry can develop suitable development strategies in three important aspects: regulatory compliance, human-AI collaborative creation, and original innovation. Technically, other AI illustration models will be optimized to improve the precision in the character design, detail depiction, and emotional expression. With the application of multimodal fusion [10], coordinated creation across text, images, and audio can be realized, effectively streamlining the illustration production process.

Moreover, the AI illustration tool editing capabilities will be gradually enhanced. Layered editing and local adjustment functionalities will solve the long-standing problem of re-editing AI-created material. The extensive usage of lightweight and locally deployable technologies will also lower the cost of high-end illustration models, thus enabling more ordinary creators to access professional AI tools.

In terms of application expansion, the scene adaptation of AI illustration will become more vertical, and specialized models for children's books, advertising, games, and other fields will gradually be implemented to improve the accuracy of content generation. The integration of AI illustration with VR/AR and 3D technologies can also create immersive visual works, further expanding the boundaries of industry applications. Copyright compliance has become a core trend in industry development, and Adobe Firefly relies on authorized materials to complete model training. As of April 2025, it has produced over 22 billion commercial compliant visual assets, with a market share of 29%. The "Artificial Intelligence Generated Synthetic Content Identification Method" released by four departments in March 2025 also provides institutional support for the industry to establish a copyright traceability and content labeling system.

The optimization of AI illustration can be promoted from four dimensions: developing style protection algorithms at the technical level, strengthening the controllability of tools and the ability to protect originality [11]; At the industry level, efforts are being made to accelerate the development of unified standards. The Industrial and Cultural Development Center of the Ministry of Industry and Information Technology has released the "Specification for Blockchain-Based Rights Confirmation System of Digital Cultural and Creative Products" in July 2025, clarifying copyright ownership and quality standards; Creators need to transform

into composite talents with both creative planning and AI operation abilities. Relevant data shows that the income of such practitioners is 30% -40% higher than that of traditional hand drawn illustrators; Universities should integrate AI illustration-related content into design curricula to cultivate professional talents that are suitable for industry development.

The value of AI technology lies in upgrading the illustration creation mode, rather than replacing art itself. Only by balancing technological innovation, copyright protection, and creative expression can the industry promote the deep integration of intelligent tools and visual arts, and achieve sustainable development.

7. Conclusion

This study demonstrates that AI-generated illustration tools, relying on the rapid development of digital technology, have deeply involved in the entire process of illustration creation, gradually growing from auxiliary drawing tools to important support for industry transformation, and have had a significant impact on the production methods, visual language, and industrial ecology of illustration. According to relevant market data, by 2025, the scale of illustration applications in the global AI image generation market has reached 7.526 billion US dollars, and the penetration rate of AI tools in the domestic illustration industry has exceeded 58%. AI tools are becoming increasingly popular in publishing, advertising, gaming, cultural and creative industries and have become one of the major drivers of the digital modernization of the industry. However, at the same time, issues such as ambiguous copyright attribution, adjustment of professional structure, and weakening of original expression have gradually emerged, leading the illustration industry into a stage of adjustment where opportunities and challenges coexist.

Illustration has traditionally been based on original conceptual design and conveying emotions and spiritual meanings. Humans as artists have individual aesthetic feelings, empathy, creativity and creative thought with peculiar human-specific qualities, which are not replaceable or substitutable with machines. It is essentially what makes AI just a tool in the process of creating art.

In order to reach long-term, healthy and regulated growth, the illustration industry needs to embrace the concept of technology as a tool and art as the soul. In addition to the current development and perfection of AI illustration tools, there must be measures implemented to enhance the copyright control systems and standards concerning its use in industries. It is advisable to encourage creators to develop their capacity in human-AI collaborative creation in order to achieve long term industrial competitiveness based on real creativity and artistic achievement.

The intense combination of AI and illustration has turned into the unstoppable direction in the development of digital cultures. The best outcome of intelligent devices will only be reached when there is a steady trade-off between technological use, artistic expression and control of copyright. It will push the illustration sector to rapid, varied and sustainable growth during the digital revolution, increase the limits of visual artistic expressions, and fulfill the needs of society with qualitative products in visual culture.

References

[1] Elgammal, A., Liu, B., Elhoseiny, M., & Mazzone, M. (2017). Can: Creative adversarial networks, generating" art" by learning about styles and deviating from style norms. arXiv preprint arXiv:1706.07068.

[2] Rombach, R., Blattmann, A., Lorenz, D., Esser, P., & Ommer, B. (2022). High-resolution image synthesis with latent diffusion models. In Proceedings of the IEEE/CVF conference on computer vision and pattern recognition (pp. 10684-10695).

[3] Gatys, L. A., Ecker, A. S., & Bethge, M. (2016). Image style transfer using convolutional neural networks. In Proceedings of the IEEE conference on computer vision and pattern recognition (pp. 2414-2423).

[4] Liao, J., Chen, X., Fu, Q., Du, L., He, X., Wang, X., ... & Zhang, D. (2024, March). Text-to-image generation for abstract concepts. In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 38, No. 4, pp. 3360-3368).

[5] Holzner, N., Maier, S., & Feuerriegel, S. (2025). Generative AI and creativity: A systematic literature review and meta-analysis. arXiv preprint arXiv:2505.17241.

[6] Wessel, M., Adam, M., Benlian, A., Majchrzak, A., & Thies, F. (2025). Generative AI and its transformative value for digital platforms. Journal of Management Information Systems, 42(2), 346-369.

[7] Zhou, E., & Lee, D. (2024). Generative artificial intelligence, human creativity, and art. PNAS nexus, 3(3), pgae052.

[8] Lazaroiu, G., & Rogalska, E. (2023). How generative artificial intelligence technologies shape partial job displacement and labor productivity growth. Oeconomia Copernicana, 14(3), 703-706.

[9] Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2024). GPTs are GPTs: Labor market impact potential of LLMs. Science, 384(6702), 1306-1308.

[10] Alayrac, J. B., Donahue, J., Luc, P., Miech, A., Barr, I., Hasson, Y., ... & Simonyan, K. (2022). Flamingo: a visual language model for few-shot learning. Advances in neural information processing systems, 35, 23716-23736.

[11] Wang, Y., Pan, Y., Yan, M., Su, Z., & Luan, T. H. (2023). A survey on ChatGPT: AI–generated contents, challenges, and solutions. IEEE Open Journal of the Computer Society, 4, 280-302.