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# Culture in Technology, Technology in Culture: The Generative Logic and Meaning Construction of Qiqiao IP Image Design

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## KEYWORDS

*Generative Artificial Intelligence (AIGC);  
Qiqiao Culture;  
IP Imagery Design;  
Intangible Cultural Heritage  
Communication*

## ABSTRACT

This study takes Generative Artificial Intelligence (AIGC) as a technological pivot to investigate its empowering mechanisms and pathways of cultural representation in the IP image design of Qiqiao culture, a form of Chinese intangible cultural heritage. By analyzing core cultural symbols such as the "Weaving Maiden" and "craftsmanship" associated with the Qiqiao Festival, and integrating the prompt-based generation logic and image construction capabilities of advanced diffusion models, the research proposes a five-stage design framework: cultural theme extraction–model training–image generation–visual refinement–media dissemination. Empirical practices conducted on platforms such as "MiduDream" demonstrate that AIGC not only improves the creative efficiency of traditional IP imagery but also expands the boundaries of Qiqiao culture's digital communication. Moreover, from a techno-cultural perspective, the study critically examines the encoding and disciplining mechanisms of cultural meaning embedded in AIGC generation processes, highlighting that while algorithmic expression enhances visual appeal, it also risks cultural superficiality and symbolic entertainment. Finally, the article outlines future research directions focusing on algorithmic localization, immersive experience construction, and co-creation mechanisms. The findings provide a replicable methodology that integrates cultural depth with technological efficiency for the design of intangible cultural heritage IP images.

## INTRODUCTION

"Culture is the soul of a nation, a witness to its history, and a vessel of collective emotional identity." As an integral part of traditional Chinese culture, Qiqiao culture carries rich historical, folkloric, and artistic significance (China News Service (CNS), 2024). Originating during the Han Dynasty, the Qiqiao Festival has a history spanning over a

thousand years, reflecting the Chinese nation's enduring reverence for wisdom and craftsmanship. However, with the acceleration of modernization, the transmission and innovation of Qiqiao culture have encountered significant challenges. The decline of traditional handicrafts has led to a gradual weakening of the festival's cultural connotation, and younger generations exhibit increasingly su-

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perficial understanding of traditional festivities. Simultaneously, the advent of the digital age has posed new questions regarding the preservation and dissemination of cultural heritage. In response, the Chinese government has in recent years emphasized the importance of digital transformation for traditional culture, promoting policies under the rubric of “digital empowerment for cultural innovation” to support the sustainable development of the cultural industry through technological means ([Publicity Department of the Central Committee of the Communist Party of China, 2024](#)).

Against this backdrop, the emergence of generative artificial intelligence (AIGC) offers new opportunities for the modern articulation of Qiqiao culture. In particular, AIGC shows great potential in the areas of IP character design, cultural symbol communication, and the innovation of cultural and creative products ([Huang, 2024](#)). This study aims to explore a systematic design framework for Qiqiao cultural IP imagery based on AIGC technologies. The research not only focuses on the construction of technical workflows and the generation of visual content, but more crucially, investigates the mediating role that AIGC plays in the translation and reconstruction of cultural meaning.

As a generative mechanism driven by deep learning, AIGC operates through a process of “prompt input – semantic modeling – image output,” transforming traditional cultural symbols into algorithmically recognizable linguistic structures and visual elements. This process is not a value-neutral technological execution; rather, it constitutes a structural reconfiguration and disciplinary framing of cultural meaning ([Couldry & Hepp, 2018](#)). For example, the image of the “Weaving Maiden” (Zhinü) in Qiqiao culture encapsulates traditional values of feminine wisdom, dexterity, and virtue. These cultural attributes are encoded within prompts and visual generation parameters as semantic templates that can be systematically recognized and algorithmically reproduced—forming what may be called an “algorithmic production of meaning.”

Therefore, AIGC should be understood not only as a technological enabler for traditional culture, but also as an active mechanism of cultural discourse reconstruction. Through the digital generation of Qiqiao's symbolic system, this study seeks to reveal the inherent tensions between technological logic and cultural logic, and to explore the interdisciplinary mechanisms that enable the visual

representation of intangible cultural heritage within the context of artificial intelligence. Ultimately, this research provides both theoretical insights and practical guidance for the visual and contemporary expression of traditional culture in the digital era.

## OVERVIEW OF AIGC

Generative Artificial Intelligence (AIGC) represents a significant branch of deep learning, playing an increasingly important role across various domains of creative design. One of its most prominent implementations is the Generative Adversarial Network (GAN), which operates through the adversarial training of two neural networks—a generator and a discriminator—enabling the automated generation of images, music, text, and other forms of content ([Goodfellow et al., 2020](#)). Since the introduction of GANs by Ian Goodfellow et al. in 2014, AIGC technologies have undergone rapid development, with applications extending into fields such as artistic creation, digital design, and brand marketing. These advancements have infused traditional cultural expressions with new vitality.

In the cultural and creative industries, AIGC—empowered by deep learning algorithms—significantly enhances both efficiency and originality in the design process ([Brock et al., 2018](#)). Designers can generate diverse artistic concepts within a short time frame, offering a rich source of inspiration for brand development and cultural product creation. AIGC tools are capable of rapidly producing various styles of IP imagery based on predefined parameters, thereby supporting the diversification of visual identities. For example, traditional figures such as the Weaver Girl from Qixi mythology can be reimagined through contemporary aesthetics like cyberpunk or “Guochao” (Chinese trend), enriching the cultural IP with enhanced fashion appeal and public engagement.

In the context of intangible cultural heritage (ICH) visual identity design, Generative Artificial Intelligence (AIGC) functions not merely as a tool for visual content production, but also as a system of structural encoding for cultural symbols. The generative logic embedded in the AIGC process—comprising the tripartite sequence of “prompt–model–output”—essentially translates cultural imagery into algorithmic variables, thereby establishing a techno-cultural mechanism for symbolic reconstruction. Taking the figure of the “Weaver Girl” (Zhinu) as an illustrative example, semantic labels

embedded in prompts—such as “feminine,” “graceful,” and “intelligent”—encode traditional expectations and idealizations of female attributes within the festive context. These labels not only reflect the aesthetic tendencies in the generated images but also reveal the reconfiguration and normative modulation of cultural symbols within a computational framework. Therefore, the design of cultural IPs driven by AIGC should be understood as a hybrid process of “technological–cultural symbiosis,” wherein the outcomes transcend mere visual outputs to entail the rearticulation and reallocation of cultural meaning (Couldry & Hepp, 2018). This perspective offers critical insight into the mechanisms by which AI participates in the visual reproduction and reinterpretation of cultural heritage.

### **A Study of Qiqiao Culture From the Perspective of the Digital-Intelligent Era**

#### ***Historical Origins and Current Status of Qiqiao Culture***

The Qiqiao Festival originated from ancient Chinese worship of the Vega star (Zhinü Xing) and can be traced back to the Han Dynasty. According to the Records of the Western Capital (Xijing Zaji), palace maids during the Han period would engage in needle-threading activities on the seventh day of the seventh lunar month to pray for dexterity—an early form of the Qiqiao tradition. Centered around women's handicraft skills, this traditional festival involved weaving, embroidery, and other forms of artistic creation to express wishes for wisdom and ingenuity. It reflects the important and intelligent roles women played within both familial and societal contexts in ancient China (Chen & Tao, 2017). Over the course of centuries, the Qiqiao Festival accumulated a rich array of legends and customs associated with love and craftsmanship. However, in modern times, its traditional forms have gradually declined. Records from the Jiaqing era of the Qing Dynasty already noted the waning of Qiqiao customs, and reports from the Republican period frequently mentioned the retreat of Qixi-related activities. After the founding of the People's Republic of China, Qiqiao customs in many regions were temporarily interrupted (Li et al., 2014). In contemporary society, the growing popularity of Western Valentine's Day, combined with changing lifestyles and accelerated social rhythms, has further diminished the cultural impact of the traditional Qixi Festival (TiMedia Research, 2023). Younger generations exhibit limited aware-

ness of the festival's core values, and the number of inheritors and participants in traditional handicraft practices has sharply decreased. These challenges have posed serious threats to the continuity of Qiqiao culture, highlighting the urgent need for innovative strategies to reawaken public interest and revitalize this intangible heritage.

#### ***Cultural Symbols and Core Values of Qiqiao Culture***

Qiqiao culture is rich in symbolic meanings, which are not only reflected in festival rituals but also imbued with broader social significance. Foremost among these symbols is the notion of “skillful craftsmanship” (qiao yi), which represents the intelligence and artisanal talents of women in ancient China. On the evening of the Double Seventh Festival, young women would demonstrate their dexterity through needle threading and crafting symbolic Qiqiao objects, in hopes of receiving blessings of wisdom and agility from the Weaving Maiden (Zhinü). This reverence for skill and ingenuity reflects the traditional society's veneration of female virtues such as diligence, cleverness, and craftsmanship (Gao, 2021). The image of the Weaving Maiden is among the most iconic symbols of Qiqiao culture. As both the protagonist of celestial folklore and the embodiment of feminine creativity, she is commonly portrayed in folk belief as “intelligent, beautiful, and highly skilled.” It is said that praying to her on the Qixi night would bestow clear vision and dexterous hands. Thus, the Weaving Maiden symbolizes the fusion of love, wisdom, and delicate artistry, expressing people's aspirations for a fulfilling life and admiration for female talent. Other symbolic elements associated with the festival include the magpie bridge (queqiao), the seven-holed needle (qi kong zhen), and the melon flowers (hua gua), which respectively represent faithful love, exceptional skill, and blessings for fertility and abundance. Together, these symbols form the spiritual core of Qiqiao culture—celebrating the transmission of craftsmanship, the recognition of feminine wisdom, and the affirmation of self-worth.

Through the ritualized practices of the Qixi Festival, traditional society provided women with a culturally sanctioned platform to exhibit their artistic talents and express their emotions. In doing so, the festival not only strengthened familial and communal bonds but also fostered a sense of cultural identity and pride among women (Zhao, 2022).

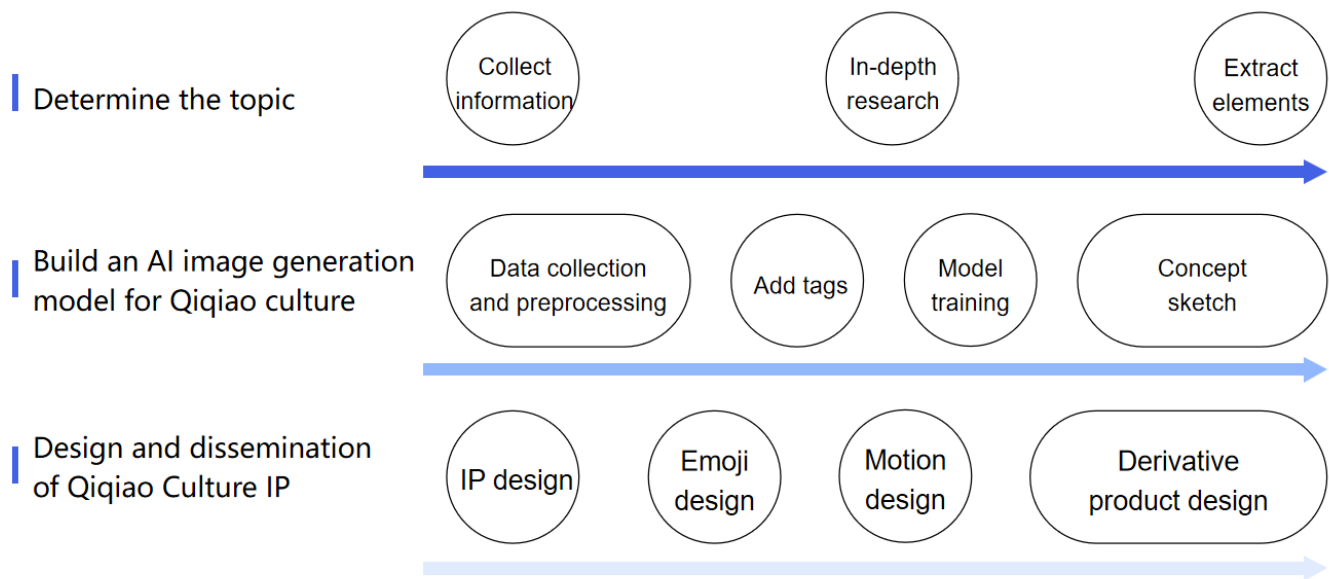


Figure 1 | shows the design path of the Qiqiao Culture IP image based on AIGC

**Optimizing the Design Pathway of Qiqiao Cultural IP through AIGC**

The current design of Qiqiao Festival cultural IP faces multiple challenges, including symbolic homogenization, superficial emotional expression, and limited modes of dissemination, which hinder the effective transmission of its deeper cultural connotations. The integration of Generative Artificial Intelligence (AIGC) offers a potential breakthrough by not only enhancing content production efficiency but also enabling automated modeling and rearticulation of cultural semantics. Technically, AIGC employs deep neural networks to embed and reconstruct traditional symbols such as the “Weaver Girl,” “Skill Fruit,” and “Magpie Bridge,” thereby facilitating an algorithmic translation of cultural imagery. In this process, AIGC functions as a ‘programming language of cultural meaning,’ wherein designers guide the model through prompt engineering to recode cultural characteristics. The resulting outputs represent a form of ‘technologically mediated living heritage’e (Cong, 2024).

On one hand, designers can use advanced generative models like MidJourney and Stable Diffusion to rapidly produce concept art based on specific prompts related to Qiqiao themes. This approach significantly shortens the design cycle while expanding stylistic possibilities. For example, the traditional image of the Weaving Maiden can be integrated with Guochao illustration styles or

infused with futuristic technological elements, breathing new life into traditional symbols and enhancing their appeal among younger audiences (Yang et al., 2025). On the other hand, from a communication perspective, AIGC-generated IP imagery is highly adaptable to new media formats such as short videos, emojis, and virtual idols, thereby transcending the spatial and temporal constraints of conventional dissemination methods. A notable example is the Dunhuang Academy, which developed AI-powered digital avatars inspired by mural figures from the Mogao Grottoes. These virtual representations became viral on social media, garnering over 200 million interactions across platforms—demonstrating the immense potential of AIGC applications in cultural communication (China Daily, 2023).

Taking the Qiqiao Festival as a case study, this research reflects on how to strike a balance between “cute chibi aesthetics” and the symbolic representation of female artisanal skill, while avoiding the algorithmic reduction of traditional female roles into monolithic visual archetypes. AIGC should thus be understood not merely as a technical tool, but as a cultural governance mechanism. Its generative logic and design paradigms form a critical nexus for constructing contemporary expressions of intangible heritage.

## **A Design Pathway for Qiqiao Festival Cultural IP Based on AIGC Technologies**

This section systematically outlines the AIGC-centered design pathway for Qiqiao cultural IP imagery, encompassing three key stages: thematic extraction, image generation, and communicative application (**Figure 1**).

### ***Defining the Thematic Focus of Qiqiao Culture***

At the initial stage of design, it is essential to conduct a comprehensive and systematic collection of materials related to Qiqiao culture in order to clarify the thematic direction. Specifically, both online and offline channels should be employed to gather representative elements and visual resources associated with Qiqiao traditions—such as the image of the Weaving Maiden (Zhinü), magpies, the seven-holed needle (qi kong zhen), balsam flower motifs, and other traditional symbols—as well as relevant myths, folklore activities, and forms of traditional art. Designers are encouraged to consult official documentation of intangible cultural heritage (ICH) projects, academic literature, and historical archives to gain a deeper understanding of the cultural ethos and aesthetic characteristics embedded in Qiqiao culture. In addition, field research plays a crucial role in this process. By engaging directly with local tradition bearers and folk experts in regions such as the Lingnan (Cantonese) cultural area, designers can obtain firsthand oral histories and craft-related insights, enriching their comprehension of the detailed practices associated with the Qiqiao Festival.

After collecting and analyzing this material, the data should be systematically classified and archived according to dimensions such as cultural symbols, visual motifs, and artisanal techniques. This facilitates the construction of a digitized Qiqiao cultural resource database. By leveraging AIGC-related technologies, designers can process and store textual, visual, and video materials digitally, resulting in a searchable knowledge repository. This not only streamlines subsequent design retrieval processes but also provides robust data support for the integration of traditional cultural elements with contemporary design. Once the thematic elements and symbolic meanings of Qiqiao culture are clearly defined, designers are better equipped to develop creative directions for IP imagery that remain rooted in cultural authenticity while resonating with contemporary aesthetic sensibilities.

## ***Constructing an AIGC-Based Image Generation Model***

In the image generation process of AIGC, the design of prompts is not only crucial for controlling visual quality but also serves as a key mechanism for encoding and regenerating cultural semantics. The structural composition of prompts—typically framed as “subject + setting + style + modifiers”—embodies a form of “instructional processing of cultural simulacra,” wherein embedded keywords such as “Weaver Girl,” “moonlit night,” “Guofeng style,” and “Qixi Festival” are computationally recognized as semantic modules. These modules collectively construct a digital representation of specific cultural aesthetics. This mechanism reflects the theory of “the mediated construction of reality” proposed by Couldry and Hepp, which posits that technology does not merely reproduce culture, but selectively amplifies particular cultural logics, thereby actively participating in the construction of social reality.

At the same time, prompts also carry the latent risk of “semantic disciplining.” When prompt inputs lean toward superficial descriptors—such as “chibi-style girl,” “ethereal aesthetics,” or “classical Chinese filters”—the resulting images may exhibit aesthetic homogenization, thereby diminishing the complexity and historical depth of the associated cultural symbolism. To mitigate this risk, designers should adopt a principle of “semantic sensitivity” in prompt engineering, enhancing the system’s capacity to articulate cultural nuances. For instance, by incorporating concrete terms such as “Qiqiao needle-threading,” “balsam blossom prints,” or “female craftsmanship,” the generated images can maintain a playful visual appeal while embodying the polysemy and ritualistic significance of Qiqiao culture. This culturally attuned technological synergy is essential to achieving nuanced and meaningful digital representations of intangible cultural heritage.

### ***The Generative Design and Dissemination of IP Visual Identity***

In terms of dissemination strategies, AIGC-generated Qiqiao IP images exhibit not only strong cross-platform adaptability but also demonstrate a reconfiguration of perceptual modes within contemporary media environments. Forms such as virtual idols, animated graphics, and emoji stickers constitute the primary channels through which digital natives engage with and perceive culture. These media forms construct what can be termed



a "mediated reality," wherein cultural memory and identity are shaped through symbolic representations within media ecosystems (Song et al., 2024). Within this context, Qiqiao cultural IP becomes embedded in everyday life; its mythological and ritualistic attributes are restructured through the fragmented logic of social media, thereby reaching users in ways that are more interactive and affectively resonant.

However, caution must be exercised, as the anthropomorphized dissemination of cultural IPs may risk reducing cultural content to mere entertainment or consumer products, thereby diminishing the original emotional resonance and socio-ritual functions of traditional festivals (Gao, 2021). Consequently, strategies for cultural IP dissemination must seek a balance between popular accessibility and cultural gravitas—leveraging media appeal to enhance user engagement, while simultaneously reinforcing cultural depth through narrative frameworks, character construction, and symbolic integration (Wang, 2023). The technical affordances of

AIGC offer new possibilities for achieving this balance. For instance, algorithmically generated interactive narratives such as “The Qixi Legend Story” or experiential modules like the “Weaver Girl DIY Workshop” can embed narrative structures within cultural contexts, thereby enabling cultural transmission to return to its essential function of meaning-making.

**AIGC-Based Practice in IP Image Design for Qiqiao Festival Culture**

**Conducting Preliminary Analysis and Demand Research**

This study takes the Cantonese Qiqiao (Double Seventh) culture as its design entry point. Recognized as a national-level Intangible Cultural Heritage (ICH) of China, the Cantonese Qiqiao tradition encapsulates the everyday wisdom and aesthetic sensibilities of women in agrarian society, while its core values—such as reverence for craftsmanship and aspiration for a better life—resonate with contemporary ideals of female inde-

Table 1 | Descriptive statistical analysis

Category	Options	Frequency	Percentage (%)	Cumulative Percentage(%)
Gender	Male	46	36.22%	36.22%
	Female	81	63.78%	100.00%
Age Group	Under 18	15	11.81%	11.81%
	18–30	101	79.53%	91.34%
	30–50	9	7.09%	98.43%
	Above 50	2	1.57%	100.00%
How well do you understand the Qiqiao Festival?	Well-informed; able to clearly articulate customs and cultural meanings	8	6.30%	6.30%
	Somewhat familiar, but unable to explain systematically	32	25.20%	31.50%
	Have heard of the festival, but do not know specific details	75	59.06%	90.55%
	Completely unfamiliar	12	9.45%	100.00%
Are you willing to learn about the Qiqiao Festival through new media formats?	Very willing; find it interesting and easier to understand	75	59.06%	59.06%
	Somewhat willing; open to new media formats	31	24.41%	83.46%
	Neutral; depends on content quality	14	11.02%	94.49%
	Unwilling; believe traditional festivals should not be entertainment-oriented	5	3.94%	98.43%
	Not interested	2	1.57%	100.00%
Total		127	100	100

pendence and artisan spirit. To ensure that the proposed design aligns with the expectations of modern audiences, this research conducted a multi-dimensional preliminary investigation comprising the following components:

**Questionnaire Survey** A total of 127 valid responses were collected from young individuals aged 18–30. Results revealed that 93.71% of respondents exhibited limited understanding of the cultural essence of the Qiqiao Festival, yet 83.47% expressed a willingness to learn about the tradition through new media channels. This indicates a latent interest among younger demographics, constrained by insufficient content supply (**Table 1**).

**Competitive Analysis** A review was conducted of existing IP cases related to Qixi (Chinese Valentine's Day) and other traditional festivals. Outstanding IPs tend to exhibit characteristics such as symbolic simplification, rich character development, and high adaptability across various narrative or media contexts. In contrast, existing Qiqiao-themed IPs often suffer from stylistic redundancy and lack of distinctive features.

**Field Research** On-site observations were conducted at Qiqiao cultural events in locations such as Zhucun, Tianhe District, Guangzhou. Findings indicated that offline events are constrained by temporal and geographic limitations, resulting in restricted audience reach. Moreover, many young participants had minimal familiarity with traditional rituals associated with the festival ([Wang & Bi, 2023](#)).

Based on the integrated findings, three core design requirements were distilled:

- **Youthful and Playful Visual Style:** Employ a cute and vibrant aesthetic to appeal to the primary target audience aged 18–30;
- **Full-Time Digital Dissemination:** Develop a digital-native IP image capable of overcoming temporal (festival-specific) and spatial (regional) constraints, enabling continuous and wide-reaching cultural transmission;
- **Deep Integration of Cultural Symbols:** Root the character design in the traditional archetype of the “Qiaoniang” (skilled woman), and incorporate symbolic elements such as magpies, auspicious clouds, the moon, and balsam flowers, thereby ensuring both high recognizability and profound cultural connotation.

In response to these design imperatives, the study proposes the creation of a culturally rich, aesthetically pleasing “Qiaoniang” IP image in a cute Chinese-style visual form—one that conveys

traditional notions of feminine ingenuity while aligning with the tastes and preferences of today's younger generations.

### ***Selection and Application of AIGC Tools***

To fulfill the design specifications, “Visionary Art” was selected as the primary AI-generated content (AIGC) illustration tool. This browser-accessible platform eliminates local installation requirements, significantly reducing technical barriers while facilitating collaborative workflows and rapid design iterations. Its integrated repository of pre-trained models and assets supports multi-style generative capabilities across diverse scenarios, rendering it particularly suitable for intangible cultural heritage (ICH) thematic innovation. Crucially, Visionary Art demonstrates superior Chinese semantic comprehension compared to alternative AI art tools, enabling precise visualization of culturally nuanced Qiqiao Festival iconography.

A curated dataset of Qiqiao cultural elements was imported into the platform, with subsequent fine-tuning of its Chinese-style illustration model via transfer learning. The operational workflow comprised: **1)** Utilizing hand-drawn conceptual sketches as base inputs (image-to-image mode); **2)** Crafting textual prompts to define character attributes and contextual elements; **3)** Iteratively calibrating generative parameters (style weight, detail density, sampling steps) through systematic test runs. This methodology yielded preliminary IP character proposals that informed subsequent design phases.

Following the validation of the overall conceptual design, we employed localized regeneration (local redraw) and other functionalities to refine details such as facial expressions and costume patterns, ultimately generating high-fidelity Qiqiao-themed IP image assets. Experimental results demonstrate that Visionary Art's AI-powered generative engine significantly enhanced design efficiency: the development cycle for a complete IP image solution was reduced from weeks under traditional manual rendering to mere days. Furthermore, the platform's capability for rapid derivative asset generation enabled the efficient creation of emoticon sticker sets and dynamic character poses within compressed timelines, thereby laying the groundwork for downstream product development ([Tang et al., 2024](#)).

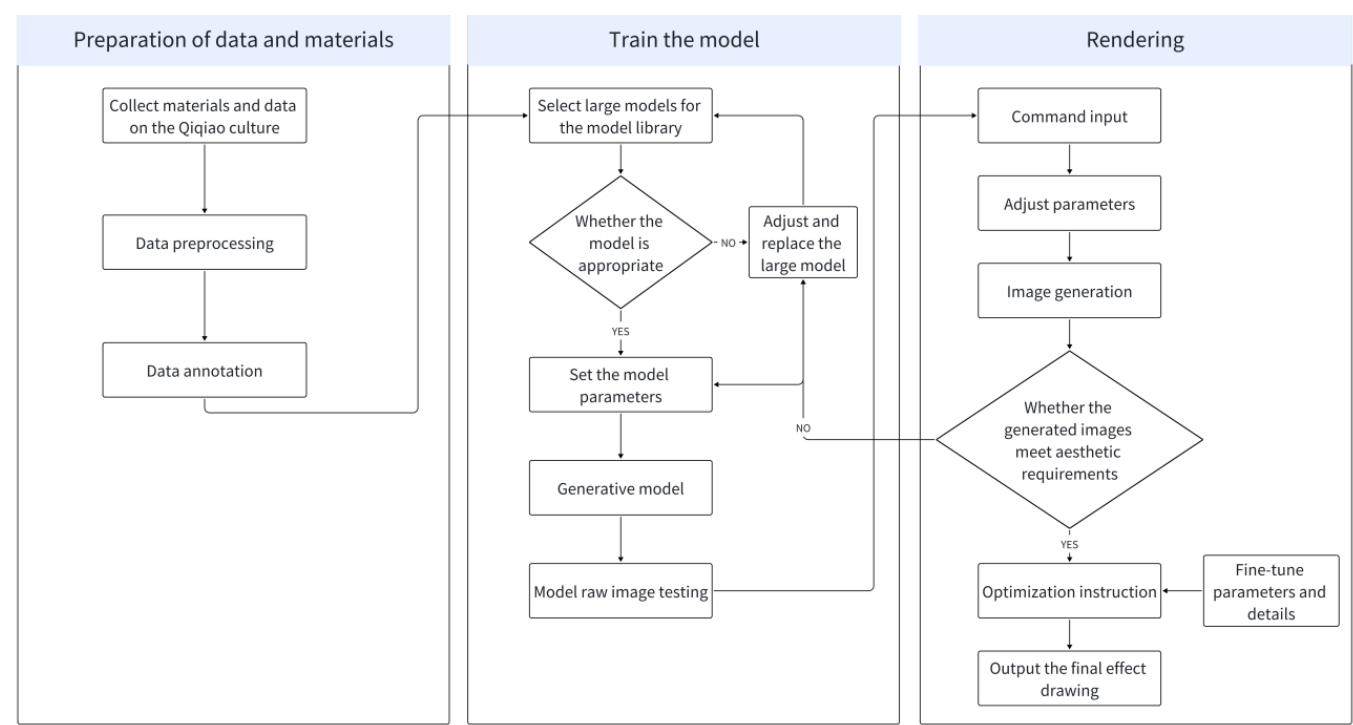


Figure 2 | Flowchart of the image generation model for Qiqiao Culture IP design based on AIGC

**Construction Process and Design Practice of IP Image Design**

This design practice takes elements of Qixi Culture as an example, combines AIGC tools to conduct IP image design for Qixi Culture, and proposes a methodological framework for AIGC-assisted IP image generation. It lays the foundation for integrating IP image design with AIGC technology (Figure 2). The design practice process is as follows:

**Data Preparation and Sketch Creation** To construct the Qixi Culture IP, we first extracted research-based elements to manually sketch preliminary drafts. These encompassed character designs, costume color schemes, and signature accessories (e.g., balsam flower hairpins, magpies) to accentuate the identity of the "Skillful Maiden." The hand-drawn sketches were subsequently scanned, simplified, and underwent contour extraction to generate AI-recognizable training images. Concurrently, we prepared PNG-format icons depicting motifs such as the Weaver Girl threading a needle and magpie bridges under moonlight. All assets were standardized in size with transparent backgrounds to ensure material quality and semantic clarity (Xu et al., 2022). Sketch-to-Image" technical workflow, whereby visual semantics extracted from sketches serve as input to provide high-quality prior information for subsequent image generation models (Zhang et al., 2023).

**Model Training and Testing** On the JiMeng platform, we loaded the aforementioned custom assets and selected its pre-trained large model as the foundation. Training parameters were configured—including generating 20 candidate images per iteration across 8 epochs. Initial small-sample testing evaluated the model's feature recognition performance regarding Weaver Girl imagery. We then employed standardized descriptive prompts (e.g., "A young Skillful Maiden in Tang-style attire with a gentle smile") for batch image generation. By comparing multiple outputs, we assessed: Facial fidelity to design expectations, Edge definition clarity, Accurate representation of Qixi cultural elements. Test results indicated that most images excelled in facial and costume details, successfully conveying the maiden's lively personality. However, certain outputs inadequately rendered background elements (e.g., starry skies, magpie bridges). To address this, we increased token weights for keywords like "magpie bridge" and "Qixi pastries" in prompts, ultimately achieving optimized model outputs (Sultan et al., 2024).

**Effect Optimization and Finalization** After selecting the optimal IP image, we performed final refinements in Photoshop. Key adjustments included: Modifying color balance and brightness/contrast to enhance layer differentiation between character and background; Enhancing ocular details and facial lighting to improve visual expressiveness. The finalized Skillful Maiden em-





**Figure 3 | IP Image Design of Qiqiao Culture**



**Figure 4 | Three-view view of the IP image of Qiqiao Culture**

bodies a chibi-style cartoon aesthetic: Wearing floral hairpins shaped like Qixi pastries, Dressed in orange Hanfu attire Adorned with magpie hair ornaments. This design balances approachable cuteness with cultural authenticity (**Figure 3**). Concurrently, orthographic projections (front/side/rear views) of the IP were generated through prompt-based iteration (**Figure 4**).

**Extended Design** Upon finalizing the core IP image, we leveraged the AIGC model's variant generation capability to rapidly produce diversified expressions and poses of the Skillful Maiden. These included:

- Expressions: joy, sorrow, blessing, prayer, shyness;
- Actions: playing embroidered balls, waving gestures (**Figure 5**).

All derivative assets maintain stylistic consistency for cross-platform applications in social media dissemination and offline merchandise design. This concludes our design practice from conceptualization to serialized assets, effectively validating AIGC's efficiency and creative potential in culturally-rooted IP development.

#### **Marketization and Communication Strategies for AIGC-Based Qiqiao Cultural IP Imagery**

With the deepening application of Generative Artificial Intelligence (AIGC) in the field of creative design, the pathways for digitally expressing traditional culture have expanded considerably. As an important component of China's intangible cultural heritage, Qiqiao culture carries profound historical significance and symbolic meaning. Supported by

AIGC technologies, the visual reconstruction of cultural symbols such as the "Weaving Maiden" and "skillful craftsmanship" enables the symbolic regeneration of Qiqiao traditions and their integration into contemporary visual narratives. In the domain of cultural and creative product design, designers can leverage AIGC-driven mechanisms in tandem with insights into modern user aesthetics and consumer psychology to develop a diverse range of products—including backpacks, toys, and digital assets (**Figure 6**) (Liang, 2024). This approach facilitates the entry of traditional cultural symbols into the consumer market in increasingly diversified forms. Such a technology-enabled mode of cultural translation not only enhances the visual appeal of intangible heritage IP imagery but also expands its reach and influence among younger audiences. By aligning traditional symbolism with contemporary market demands, AIGC empowers a new paradigm of cultural dissemination that is both innovative and commercially viable.

In terms of communication strategy development, AIGC-generated IP imagery exhibits high media plasticity, enabling cross-platform and multi-channel distribution across various media formats. The integration of emerging media technologies—such as social media, e-commerce platforms, virtual reality (VR), and augmented reality (AR)—offers Qiqiao culture new possibilities for immersive engagement and global reach within virtual spaces. Designers can leverage AIGC to automatically



**Figure 5 | Design of Qiqiao Culture IP Emoticons**

generate lightweight content formats such as emojis, short videos, and interactive characters, thereby stimulating user-driven content co-creation and promoting a shift toward participatory cultural dissemination. On the offline front, collaborations with museums, cultural and creative industry parks, and branded commercial venues can support the construction of AIGC-driven immersive exhibitions, further strengthening emotional resonance and cultural identity among audiences. Additionally, the implementation of cross-industry co-branding strategies enhances the market visibility of Qiqiao IP. Joint development initiatives with fashion brands, animation studios, and game developers not only increase public exposure but also unlock new opportunities for industrial transformation—ultimately expanding both the cultural value and commercial potential of Qiqiao cultural IP.

For practical promotion, precise market positioning and data-driven decision-making serve as key driving forces. Through behavioral profiling and interest-based analytics, designers can identify the preferences of target audiences, enabling the cre-

ation of personalized communication content and its strategic dissemination. This approach significantly enhances both the efficiency and depth of cultural transmission. Moreover, by leveraging influencer partnerships, community engagement strategies, and platform-specific distribution mechanisms, it is possible to strengthen brand loyalty and user participation—while preserving the cultural richness embedded in the IP image. In summary, the AIGC-empowered design of Qiqiao cultural IP imagery not only demonstrates a sustainable innovation pathway for intangible cultural heritage, but also offers a viable model for the market-oriented transformation of traditional culture within the digital media environment.

## CONCLUSION AND PROSPECT

This study focuses on the symbolic system and digital transformation logic of Qiqiao culture, and proposes a generative artificial intelligence (AIGC)-driven design framework for cultural IP development. It systematically explores the full





Figure 6 | Application of cultural and creative products derived from the Qiqiao Culture IP

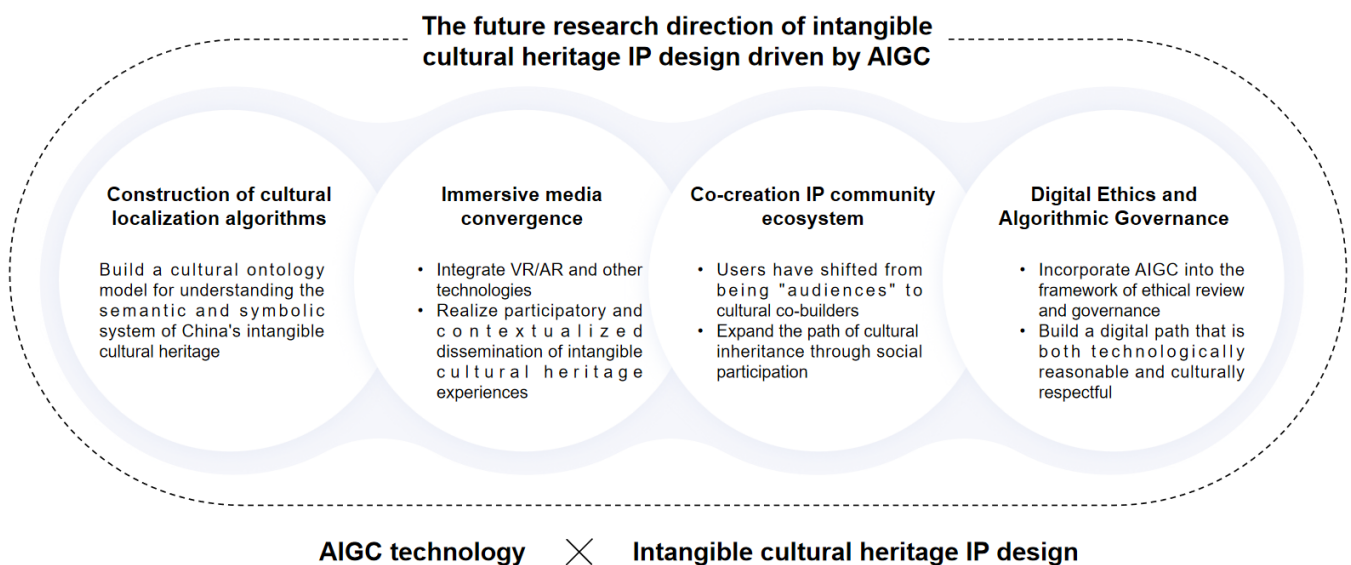


Figure 7 | The future research direction of intangible cultural heritage IP design driven by AIGC

process from data acquisition and semantic extraction to image generation and product dissemination. On the practical level, image-generation experiments conducted via platforms such as Mid-Journey and Stable Diffusion demonstrate the real-world effectiveness of AIGC in enhancing the creative efficiency and communicative expressiveness of intangible cultural heritage (ICH) IPs. Previous studies have shown that domain-specific customization methods based on diffusion models can significantly improve the quality of image generation and provide technical support for culturally distinctive visual representations (Zhu et al., 2023). On the theoretical level, AIGC is positioned not merely as a design tool but as a cultural encoder and reconfigurator. The mechanisms of prompt engineering and image synthesis serve as a form of "cultural translation within a technological

context," embedding a latent process of cultural value reconstruction and normative reconfiguration. This generative logic encapsulates both the designer's expressive intentions and the algorithmic structure, thereby redefining authorship and modes of representation in the context of AI-driven design. Consequently, it provokes critical discourse around intention formation, content ownership, and aesthetic sovereignty in the domain of computational creativity (McCormack et al., 2025).

However, AIGC-driven cultural expression is not without risks. While it revitalizes intangible heritage imagery, algorithmic generation may also lead to visual homogenization, superficial aesthetics, and the entertainment-driven simplification of symbolic content. In some cases, it may even unconsciously reinforce cultural stereotypes or dilute the deeper structural dimensions of heritage traditions. Exist-

ing research suggests that, in the absence of ethical safeguards, such algorithmic processes can undermine cultural subjectivity and destabilize established systems of value during emotional representation and cultural encoding (FU et al., 2025). Therefore, future design practices must be grounded in principles of cultural sensitivity and ethical reflexivity, remaining vigilant against excessive technological intervention that might override traditional values. Instead, efforts should actively explore the tension between technological empowerment and cultural sovereignty. On this basis, computational approaches that account for temporality and symbolic spatiality may further expand AIGC's application in narrative imaging, contextual cultural adaptation, and the construction of deep symbolic systems (Li et al., 2025).

Based on these reflections, future research can proceed along several key trajectories: **1)** advancing the cultural localization of AIGC algorithms by constructing ontology models capable of interpreting the semantics and symbolic systems of Chinese intangible heritage; **2)** integrating immersive technologies such as VR/AR to enable participatory and contextualized forms of experiential heritage communication; **3)** developing co-creative IP community ecosystems that transform users from passive audiences into active cultural contributors, thereby strengthening the social foundations for heritage transmission. Most critically, AIGC should be situated within broader discourses on digital ethics and algorithmic governance, in order to construct a heritage digitization pathway that balances technological rationality with cultural reverence (Figure 7).

The AIGC-driven design of Qiqiao cultural IPs not only demonstrates the potential for dynamic innovation within traditional cultural frameworks, but also signals a profound shift in modes of cultural expression in the age of artificial intelligence. Within the interactive co-construction of technology, culture, and users, we are witnessing a pivotal moment in the integration of heritage traditions with algorithmic environments. Only by approaching technology with reverence for tradition can we ensure that intangible cultural heritage is not merely digitized, but also meaningfully seen, understood, and transmitted amid the currents of the digital era.

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## References

1. China News Service (CNS). (2024, January 29). Xi's remarks: Culture is the soul of a country and a nation. <https://www.chinanews.com.cn/gn/2024/01-29/10154952.shtml>
2. Publicity Department of the Central Committee of the Communist Party of China. (2024, August 23). Empowering the Reform of Cultural Systems and Mechanisms Through Digital Technology. Qiushi Online. [https://www.qstheory.cn/qshyjx/2024-08/23/c\\_1130195156.htm](https://www.qstheory.cn/qshyjx/2024-08/23/c_1130195156.htm)
3. Huang, Y. (2024, March 25). The new generation of artificial intelligence empowers the development of the digital cultural industry. Chinese Social Sciences Today. [https://www.cssn.cn/skgz/bwyc/202403/t20240325\\_5740994.shtml](https://www.cssn.cn/skgz/bwyc/202403/t20240325_5740994.shtml)
4. Couldry, N., & Hepp, A. (2018). The mediated construction of reality. John Wiley & Sons.
5. Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., ... & Bengio, Y. (2020). Generative adversarial networks. Communications of the ACM, 63(11), 139-144. <https://doi.org/10.1145/3422622>
6. Brock, A., Donahue, J., & Simonyan, K. (2018). Large scale GAN training for high fidelity natural image synthesis. arXiv preprint arXiv:1809.11096. <https://doi.org/10.48550/arXiv.1809.11096>
7. Chen, H., & Tao, W. (2017). The revival and restructuring of a traditional folk festival: Cultural landscape and memory in Guangzhou, South China. Sustainability, 9(10), 1767. <https://doi.org/10.3390/su9101767>
8. Wei, T., Huiling, C., & Shuiqing, C. (2014). Influence of Lingnan traditional folk festival reconstruction on residents' place attachment: A case study on Qiqiao Festival in Guangzhou Zhucun. Acta Geographica Sinica, 69(4), 553-565. <https://doi.org/10.11821/dlx201404011>
9. TiMedia Research. (2023, August 22). Are love-themed shopping festivals losing their allure in China? Dao Insights. <https://daoin-sights.com/news/are-love-themed-shopping-festivals-losing-their-allure-in-china/>
10. Gao, X. (2021). A study of the differences about Chinese Qixi Festival custom – Taking Shanxi's old local chronicles as an example. International Journal of Culture and History, 8(1), 1–7. <https://doi.org/10.5296/ijch.v8i1.18154>
11. Zhao, Y. (2022). A study on the customs and connotations of Qixi Festival. Advances in Higher Education, 6(3), 98–102. <https://ojs.usp-pl.com/index.php/ADVANCES-IN-HIGHER-EDUCATION/article/view/6033>
12. Cong, L. (2024). A framework study on the application of AIGC technology in the digital reconstruction of cultural heritage. Appl. Math. Nonlinear Sci, 9(1). <http://dx.doi.org/10.2478/>
13. Yang, R., Wei, Z., & Xian, L. (2025). Innovating China's Intangible Cultural Heritage with DeepSeek+ MidJourney: The Case of Yangliuqing theme Woodblock Prints. arXiv preprint arXiv:2506.14104. <https://doi.org/10.48550/arXiv.2506.14104>
14. China Daily. (2023, February 20). Dunhuang Academy's digital flying sky wins over young netizens—digital twin in Grottoes gains over 200 million interactions. Qiushi. Retrieved from [https://subsites.chinadaily.com.cn/Qiushi/2023-02/20/c\\_859737.htm#:~:text=The%20Dunhuang%20Academy%20employs%20a,paintings%20in%20the%20Mogao%20Grottoes](https://subsites.chinadaily.com.cn/Qiushi/2023-02/20/c_859737.htm#:~:text=The%20Dunhuang%20Academy%20employs%20a,paintings%20in%20the%20Mogao%20Grottoes)
15. Song, L., Chow, O. W., Na, M., & Sarjit, S. G. (2024). Virtual idol and youth identity: the impact of mainstream culture on the virtual idol online fanbase community in China. Studies in Media and Communication, 12(2), 100-115. <https://dx.doi.org/10.11114/sm-c.v12i2.6658>
16. Gao, J. (2021). Analysis of the anthropomorphism phenomenon in online political communication. People's Tribune, (08), 94–96.
17. Wang, W. (2023). The Development Status of IP Culture in Chi-

- na's Cultural and Creative Industries. *Communications in Humanities Research*, 23, 121-133. <https://doi.org/10.54254/2753-7064/23/20230854>
18. Wang, S., & Bi, D. (2023). Marginal Diminishing Effects in Intangible Cultural Heritage Experience—Case Study on Guangzhou Qixi Natural Resort. *Academic Journal of Humanities & Social Sciences*, 6(7), 104-113. <https://doi.org/10.25236/AJHSS.2023.060719>
  19. Tang, Y., Zhang, N., Ciancia, M., & Wang, Z. (2024, November). Exploring the Impact of AI-generated Image Tools on Professional and Non-professional Users in the Art and Design Fields. In *Companion Publication of the 2024 Conference on Computer-Supported Cooperative Work and Social Computing* (pp. 451-458). <https://doi.org/10.1145/3678884.3681890>
  20. Xu, P., Hospedales, T. M., Yin, Q., Song, Y. Z., Xiang, T., & Wang, L. (2022). Deep learning for free-hand sketch: A survey. *IEEE transactions on pattern analysis and machine intelligence*, 45(1), 285-312. <https://doi.org/10.1109/TPAMI.2022.3148853>
  21. Zhang, C., Wang, W., Pangaro, P., Martelaro, N., & Byrne, D. (2023, June). Generative image AI using design sketches as input: Opportunities and challenges. In *Proceedings of the 15th Conference on Creativity and Cognition* (pp. 254-261). <https://doi.org/10.1145/3591196.3596820>
  22. Sultan, Y., Ma, J., & Liao, Y. Y. (2024). Fine-Tuning Stable Diffusion XL for Stylistic Icon Generation: A Comparison of Caption Size. arXiv preprint arXiv:2407.08513. <https://doi.org/10.48550/arXiv.2407.08513>
  23. Liang, J. (2024). The application of artificial intelligence-assisted technology in cultural and creative product design. *Scientific Reports*, 14(1), 31069. [10.1038/s41598-024-82281-2](https://doi.org/10.1038/s41598-024-82281-2)
  24. Zhu, J., Ma, H., Chen, J., & Yuan, J. (2023). Domainstudio: Fine-tuning diffusion models for domain-driven image generation using limited data. <https://doi.org/10.48550/arXiv.2306.14153>
  25. McCormack, J., Gifford, T., & Hutchings, P. (2019, April). Autonomy, authenticity, authorship and intention in computer generated art. In *International conference on computational intelligence in music, sound, art and design (part of EvoStar)* (pp. 35-50). Cham: Springer International Publishing. <https://doi.org/10.48550/arXiv.1903.02166>
  26. FU, K., Ye, C., Wang, Z., Liu, Z., Wu, M., & Yuan, Y. (2025). Ethical Dilemmas and the Reconstruction of Subjectivity in Digital Mourning in the Age of AI: An Empirical Study on the Acceptance Intentions of Bereaved Family Members of Cancer Patients. *Frontiers in Digital Health*, 7, 1618169. <https://doi.org/10.3389/fdgth.2025.1618169>
  27. Li, Y., Ye, C., Wang, P., Yang, L., & Zhou, S. (2025). An Interpretation of Computational Methods of Time Consciousness and Symbolic Space in Photographic Art in the Age of Digital Imaging. *J. COMBIN. MATH. COMBIN. COMPUT*, 127, 1477-1493. <https://doi.org/10.61091/jcmcc127a-085>