



## Research on Interior Design Strategies for the Digital Display of Qiang Embroidery

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### Abstract

With the development of technology, digital display techniques have given more possibilities for the preservation and innovation of traditional cultural heritage, including intangible cultural heritage (ICH). This study focuses on Qiang embroidery—a representative ICH item of the Qiang ethnic group in China Southwest area—and explores spatial display strategies that integrate digital technologies. Through literature review and interdisciplinary research methods, the study investigates how digital tools can be embedded in the spatial presentation of Qiang embroidery. Grounded in the cultural and artistic characteristics of Qiang embroidery, the study proposes a three-stage spatial display framework: "form", "context" and "content", which helps to enhance the aesthetic and experiential engagement of visitors. This research aims to enrich public appreciation, promote better understanding of Qiang embroidery's unique charm, and expand its possibilities for inheritance and development in contemporary society. The findings offer both theoretical perspectives and practical references for the protection and transmission of Qiang embroidery as an intangible cultural heritage.

### Keywords

Qiang embroidery; intangible cultural heritage; interior design; museum design; digital media

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### Introduction

Qiang embroidery is a traditional art form deeply rooted in the cultural heritage of the Qiang people, an ancient ethnic group in southwestern China, mainly living in Sichuan's Aba Prefecture. Known for its unique patterns, colors, and craftsmanship, Qiang embroidery expresses connections to nature, belief, and daily life. Listed as a National Intangible Cultural Heritage in 2008, it now faces challenges in inheritance and sustainable development. Traditional display methods no longer meet the demand for immersive cultural experiences, while digital technology offers new possibilities for its revitalization. Integrating digital media with interior display design provides an innovative approach

to preserving and promoting Qiang embroidery in contemporary contexts.

### Qiang Embroidery

#### *Cultural Connotations of Qiang Embroidery*

"The Qiang people originate from the ancient Qiang tribe and refer to themselves as 'Erma,' also known as 'Ermai,' with various transliterations across regions. They are often called the 'people on the clouds' and regarded as a 'living fossil' of ethnic groups." As a representative intangible cultural heritage of the Qiang ethnic group, Qiang embroidery traces its origins back to the late Neolithic period. Archaeological findings suggest that the painted

pottery patterns of the Majiayao culture excavated from the upper Min River bear a strong resemblance to the geometric motifs of Qiang embroidery, such as rope and meander patterns, indicating the close relationship between Qiang embroidery and the ancient Qiang people's lifestyle. Although the Qiang people have no written language, the embroidery technique has been passed down orally and through practice from mother to daughter. After the 2008 Wenchuan earthquake, the Qiang ethnic cultural heritage suffered significant damage. Qiang embroidery was listed as a national-level intangible cultural heritage, making its protection and inheritance an important topic for preserving Qiang culture.

Qiang embroidery reflects the deep cultural memory and wisdom of the Qiang people. Its patterns, drawn from nature and daily life, carry rich symbolic meanings linked to their spiritual beliefs and traditions. For example, sheep and horn motifs honor their totem and pastoral roots, while cloud patterns show reverence for nature and a desire to connect with the heavens. Agricultural symbols like wheat ears and golden melons represent hopes for good harvests, and fire sickles reflect sun worship. Other motifs express blessings—peonies for wealth, pomegranates for fertility, and dragon-phoenix designs for harmony. These patterns go beyond decoration, acting as abstract expressions of the Qiang people's worldview and cultural identity.

### *Artistic Expressions of Qiang Embroidery*

Qiang embroidery exhibits rich and diverse artistic expressions. In terms of composition and techniques, medallion and corner floral patterns often use symmetrical central layouts, such as the "Four Sheep Protecting Treasure" design, while border patterns employ two-directional continuous rhythm. The primary stitching technique is cross-stitching, supplemented by couching, locking stitch, seed stitch, among others. Notably, the "cross-stitch" technique is entirely composed by eye, showcasing the exquisite craftsmanship of Qiang women. Regarding color usage, Qiang embroidery features strong contrasts: monochrome embroidery with black background and white thread conveys simplicity and antiquity, while polychrome embroidery employs highly saturated reds, blues, yellows, etc. Red symbolizes solar worship, and black represents resilience. There are regional variations in color palettes; for example, in Chibusu area, Mao County, Aba Tibetan and Qiang Autonomous Prefecture of Sichuan, where Qiang culture is influenced by Tibetan culture, the colors tend to be more vivid. Conversely, in Beichuan Qiang Autonomous County, Mianyang City, Sichuan Province, Qiang embroidery incorporates softer Han Chinese color tones.

Overall, Qiang embroidery values not only aesthetics but also functionality. Traditional textiles often feature "dog tooth" patterns on cuffs for durability and reinforcement. As a "wordless history book," Qiang embroidery carries the Qiang people's ecological wisdom and worldview. Through

digital preservation and innovative design—such as extracting sheep horn motifs for contemporary fashion—Qiang embroidery continues to live on as a dynamic cultural legacy.

### **Current Practices in the Spatial Display of Qiang Embroidery**

At present, the exhibition of Qiang embroidery primarily relies on traditional museum displays, with limited integration of digital technologies into spatial design. For instance, at the Qiang Ethnic Museum in Mao County, most exhibits are presented through physical display cases, with limited use of digital display methods. The few interactive touchscreen devices available are mainly used to show static images of Qiang embroidery, serving merely as supplementary information sources rather than being integrated with the content and museum environment.

Many digital exhibitions of Qiang Embroidery delivers information in a one-way method. Visitors passively observe contents without opportunities for interaction. As noted by Li (2023) in her study, traditional display methods are often inadequate for conveying the evolution of Qiang embroidery patterns—from natural imagery to abstract symbols. As a result, audiences may perceive motifs such as the "fire basin flower" or "ram horn pattern" merely at a surface level, without grasping deeper symbolic meanings. Additionally, physical embroidery artifacts and videos demonstrating stitching techniques are often located in separate exhibition zones, making it difficult for viewers to connect the visual patterns with the making process and craftsmanship. It affects the overall experience and effectiveness of learning during the exhibition.

Moreover, the use of digital technologies is limited to video playback, with minimal integration into the spatial design. Immersive experiences—those that leverage spatial storytelling to enhance audience engagement and cultural immersion—are rarely realized. Hao (2023) has pointed out that current digital displays often lack interactive support, making it difficult to reconstruct the complex cultural context of intangible heritage within existing exhibition settings. Wang (2021) further reveals that audiences under the age of 35 express a strong desire for interactive experiences that connect exhibition content with spatial design in order to better understand cultural crafts. However, most current exhibitions lack interactive zones or devices such as VR, making it difficult to effectively convey the cultural atmosphere and meanings embodied in Qiang embroidery.

In summary, traditional exhibition methods tend to separate "digitalization" from "spatial experience," lacking a holistic integration between digital content and the overall interior layout. This approach weakens both the cohesion of exhibitions and the audience's engagement with the culture on display. Digital technology should not be treated as a

mere supplement to conventional exhibitions; rather, it should become a central component. When content, technology, and space are fully integrated, technology can serve as a powerful storytelling tool. By fostering interaction, exhibitions can evoke emotional resonance and deeper understanding of Qiang embroidery's culture, enhancing its appeal and communicative power. Ultimately, such strategies support the transmission and revitalization of traditional crafts like Qiang embroidery in contemporary cultural contexts.

## Interior Design Strategies for the Digital Display of Qiang Embroidery

Digital technology brings new possibilities to the presentation of Qiang embroidery. Unlike traditional static displays, digital methods create more engaging and immersive experiences, helping audiences better appreciate the craft's artistic beauty and cultural meaning. This study draws on existing theoretical frameworks by Li (2023). In her study, she proposed a three-staged exhibition structure of "Form – Context – Content". In this article, digital display methods are applied to the structure and integrated with the interior display space.

### *The Form of Qiang Embroidery*

The first stage is form of Qiang embroidery. It highlights the visible elements of Qiang embroidery: its patterns, techniques, and visual aesthetics. As the entry point of the exhibition, it aims to capture visitors' attention and spark interest by combining physical exhibits with digital enhancements.

Various digital methods can be applied. For example, high-resolution scanning and digital archiving of embroidery motifs create a detailed pattern database. These digital assets allow for accurate preservation and flexible application across different interactive platforms. By integrating the techniques, Qiang embroidery can be displayed in a more dynamic and engaging manner within the exhibition space. For instance, 3D holographic projection can be used to present embroidery patterns in rotation, allowing visitors to appreciate their structure and design from multiple angles. Interactive touchscreens enable high-resolution zooming, giving viewers the opportunity to closely observe the stitching techniques. QR codes placed beside physical exhibits provide instant access to instructional videos that demonstrate embroidery methods in detail. In addition, some digital systems offer semantic interpretation features, where tapping on a pattern triggers explanations of its symbolism and meaning, effectively connecting visual elements with the deeper knowledge of intangible cultural heritage.

In sum, digital presentation not only overcomes the limitations of traditional displays, where visitors can see but not touch, but also enables more intuitive interaction. These interactive features provide visitors with a richer, more engaging way to access exhibit content and help deepen

their understanding of Qiang embroidery's cultural and artistic value.

### *The Context of Qiang Embroidery*

Following the visual display of form, the second stage focuses on displaying the cultural context of Qiang embroidery. "Context" refers to the historical and cultural evolution of Qiang embroidery. Building upon the audience's initial visual understanding, this stage employs spatial narrative design and digital technologies to construct immersive environments and stories. These techniques help visitors shift from aesthetic appreciation to cultural comprehension by illustrating deeper meanings behind Qiang embroidery. This contextual presentation is grounded in interior narrative space design. A narrative space design incorporates dimension of time and interior space to transform static displays into immersive storytelling environments.

In sum, the narrative can unfold along the historical development of Qiang culture and embroidery techniques, embedding folk legends, daily life scenes, and religious beliefs to gradually build the audience's understanding of the cultural background. The first step in designing a narrative display is building a storyline, centered around Qiang legends, which connects various exhibits. For example, the real-life story of a Qiang embroiderer can be used to introduce Yun Yun Shoes, which symbolize romantic love. An animated short film could narrate this cultural metaphor, accompanied by physical embroidered artifacts, thereby evoking emotional resonance in the viewer. Multisensory exhibition techniques further enrich the storytelling. Qiang flute music, herbal scents like qianghuo and danggui, and tactile elements can stimulate sight, hearing, smell, and touch, enhancing immersive experience and emotional memory.

In crafting such narrative spaces, digital technology plays a vital role. High-precision 3D modeling can create a database of models, while panoramic image projection simulates traditional Qiang settings such as stone towers or mountainous landscapes, allowing audiences to experience the cultural ambiance more vividly.

The concept of using digital technology to reconstruct the native cultural environment, traditional lifestyles, and natural settings has proven successful in practice. A notable example is the "Harmonious and Tranquil Dwelling" exhibition in the China Pavilion at the 2019 Beijing International Horticultural Exhibition. The design team combined 3D modeling, high-resolution stereoscopic projection, and surround sound technologies to create an immersive exhibition space. By integrating aesthetic elements from traditional Chinese painting, such as the use of negative space and the expression of depth and distance, into the spatial design, the project achieved an innovative application of digital technology in conveying cultural ambiance.

The incorporation of VR devices enables deeper immersion, allowing visitors to "step into" a three-dimensional virtual Qiang village and engage with the cultural environment dynamically. VR can not only recreate daily life scenes but also simulate folk customs. For instance: In a virtual wedding scene in Luobozhai, visitors can see the bride wearing a cross-patterned headscarf and the groom in Yun Yun Shoes, while hearing interactive love songs like "Sending Yun Yun Shoes to My Love, Come Back Riding the Clouds". Around the hearth, an embroiderer works on a Fire Steel Pattern Waistband, while narration explains the connection between fire deity worship and daily labor. On the rooftop of a virtual stone tower, visitors see white stones, a sacred Qiang symbol. An animated scene transforms the rooftop into an altar, interpreting the symbolic role of white stones in ritual life.

These digitally constructed scenes fuse Qiang embroidery's visual symbols and cultural narratives, enhancing emotional engagement. Given that Qiang embroidery comes from a culture with oral tradition and no written script, this nonverbal storytelling through digital exhibition provides a powerful platform for conveying memory and belief, fostering audience participation and emotional involvement, and amplifying the heritage value of Qiang embroidery. Through the immersive reconstruction of cultural context, Qiang embroidery is no longer a static object but becomes a cultural medium that can be "entered, heard, and felt." The core strategy at this stage is to use story as structure, space as stage, and technology as bridge, integrating traditional heritage with contemporary exhibition experiences and offering new dimensions for showcasing Qiang embroidery.

### *The Content of Qiang Embroidery*

After the stages of visual display of form and contextual immersion of Qiang Embroidery, the third and final stage centers on contents of it. This stage is to show the deeper cultural and symbolic connotations of Qiang embroidery. The goal is to encourage active audience engagement and emotional resonance through interactive digital design, allowing a more holistic understanding of Qiang culture.

This stage focuses on transforming passive viewing into active participation by leveraging digital technology to create meaningful interactions between visitors and Qiang embroidery. Various interactive platforms and devices can be integrated to enhance both engagement and cultural understanding.

For example, a VR embroidery simulator allows visitors to experience traditional stitching techniques such as the tiaohua method. Through motion tracking, users replicate stitching gestures, while the system provides real-time feedback on needle angle and rhythm, offering an immersive and hands-on learning experience.

A digital pattern design platform provides a modular library of traditional motifs, such as sun-and-moon or vine patterns. Visitors can mix and match designs, receive intelligent suggestions on composition and color, and project their creations onto virtual Qiang garments for souvenir photos. This open-ended creative process encourages deeper appreciation of the cultural symbolism behind the patterns.

In the cultural-creative interaction zone, installations like Weaving Memory support collaborative design. Participants use hand gestures to generate dynamic brocade patterns that merge personal memories with Qiang cultural elements. These digital works can be saved as NFT-style collectibles or customized into physical items such as cushions, bookmarks, ornaments, or personalized souvenirs. This blend of personal expression and cultural heritage promotes greater emotional connection and real-world application of Qiang embroidery in contemporary life. This type of personalized, collaborative interaction both enhances the visitor experience and stimulates creative enthusiasm. It also supports the application of traditional craft, boosting the communicative power and practical value of Qiang embroidery in modern life.

Such interactive installation designs have also been reflected in international exhibition practices. For example, the Cooper Hewitt Smithsonian Design Museum in New York developed a "digital pen" interaction system in 2015. This system provides each visitor with a dedicated digital pen, allowing them to freely draw on interactive touch tables during the exhibition. The system matches the drawings with elements from the museum's collection, and the content created is instantly transformed into personalized digital works. Visitors can choose to save their creations to a personal online account and take them home. This interactive design builds a bridge between the user, the medium, and the exhibits, enabling visitors to deeply engage with the cultural content on display and create their own unique artifacts, thereby enhancing the depth of learning.

In summary, this paper proposes a design cycle for the digital exhibition of Qiang embroidery. It starts from visual presentation, to immersive cultural context, and finally to interactive exploration of Qiang embroidery display. This step-by-step strategy not only enriches visitors' understanding and appreciation of Qiang embroidery, but also leverages digital technology to spark broader interest in traditional culture.

By offering more engaging and accessible experiences, such exhibitions encourage audiences to appreciate, approach, and better understand the cultural meaning behind Qiang embroidery. In doing so, they subtly foster greater awareness and recognition of intangible cultural heritage.

It is hoped that the strategies proposed in this paper can offer new perspectives for the preservation and promotion of traditional crafts, giving Qiang embroidery more

opportunities to be seen and appreciated in modern contexts, thereby sustaining its vitality.

The final section of this paper will discuss the challenges and future prospects of digital display for Qiang embroidery, from the dual perspectives of cultural transmission and technological development.

## Conclusion

This paper approaches the study from the perspective of interior museum design, systematically exploring the pathways for the digital application of Qiang embroidery. By analyzing the cultural connotations of Qiang embroidery, evaluating the current state of digital exhibition technologies, and reviewing relevant theoretical frameworks in exhibition design, the study proposes a design model of "Form-Context-Content" for digital display.

The research aims to provide theoretical review for the preservation and innovation of Qiang embroidery, while enriching both the content and form of intangible cultural heritage exhibition design.

It is acknowledged that theoretical exploration may have certain limitations, and the practical implementation of digital displays for Qiang embroidery may face various challenges.

## *Protection of Qiang Embroidery as Intangible Cultural Heritage*

As a significant representative of Chinese traditional culture, Qiang embroidery requires a delicate balance between inheritance and innovation in the context of digital exhibition. Digitalization is not only a means of cultural dissemination but also a form of creative reinterpretation. Thus, it is crucial to accurately convey the profound cultural meanings and unique artistic values of Qiang embroidery, avoiding excessive commercialization or entertainment-oriented displays that may distort its essence. This is identified as one of the major challenges in its digital representation.

Cross-disciplinary collaboration is essential for a more comprehensive understanding of Qiang cultural contexts and the accurate presentation of its artistry. In exhibition design, it is also vital to respect the aesthetic preferences of the Qiang people, actively incorporate their perspectives, and merge traditional embroidery techniques with new technologies and concepts. Only by doing so can we create Qiang embroidery exhibition works that retain ethnic authenticity while resonating with contemporary aesthetics, thus supporting its sustainable development and transmission.

## *Challenges of Digital Exhibition Technologies*

In addition to the challenges of interpreting Qiang

embroidery culture, the practical application of digital technology also faces several problems. Firstly, visitors come from diverse educational backgrounds and have varying levels of familiarity with digital technologies, making the digital divide a key concern in the integration of digital tools into exhibition design. Therefore, it is essential for exhibition design to respect audience diversity by offering inclusive and varied digital experiences, enabling visitors from different backgrounds to engage in ways that suit their needs. A notable example is the Hall of Earth and Space at the American Museum of Natural History in New York, where the design team employed a wide range of exhibition methods—including academic content planning, multimedia installations, real-time interactivity, visual displays, and kinetic models—to cater to audiences of different ages, cultures, and educational levels. The exhibition translates complex scientific knowledge in fields such as physics and astronomy into intuitive and accessible visual language, allowing every visitor to gain meaningful insights from the experience.

Secondly, digital displays typically require substantial financial and technological investment, and are dependent on equipment and resources. Digital exhibitions often require significant financial and technical investment and rely heavily on advanced equipment and resources. For instance, the acquisition of high-resolution imagery demands professional equipment and expertise; VR and AR technologies remain relatively underutilized; holographic projection and other cutting-edge technologies are costly and require specific spatial conditions. For many small- to medium-sized exhibition venues or local museums, the procurement and maintenance of these technologies present substantial pressure.

To address these technological barriers, collaboration with universities, research institutes, and tech enterprises can help integrate resources, share technologies, and lower the threshold for implementing digital devices. It is also important to select appropriate technical solutions based on specific site conditions and to continually experiment with new digital exhibition techniques in practice, collecting feedback to improve their applications. With the continuous advancement of digital technologies and growing public interest in traditional culture, the digital exhibition of Qiang embroidery is poised to occupy an increasingly prominent role in the preservation and promotion of intangible cultural heritage.

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