

Digital Inheritance of Shaanxi Qiang Embroidery

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ABSTRACT

Information exchange and dissemination in the Internet era have surpassed any period in history. As the "root" of the Qiang people, southern Shaanxi has unique artistic characteristics in its embroidery. Under the background of the traditional cultural dissemination boom of the Silk Road of the "Belt and Road Initiative", this paper fully explores the value of the traditional embroidery art of the Qiang people in southern Shaanxi, analyzes the protection status of the traditional embroidery art of the Qiang people in southern Shaanxi, innovates the development, presentation and dissemination of the traditional embroidery art of the Qiang people in southern Shaanxi in a digital way, and proposes a digital protection and dissemination strategy for the traditional embroidery art of the Qiang people in southern Shaanxi. This will be a new idea for the regeneration of the traditional embroidery art of the Qiang people in southern Shaanxi, which can allow the traditional embroidery art of the Qiang people in southern Shaanxi to be regenerated and continued, and spread to the countries along the Belt and Road.

1. INTRODUCTION

Under the background of contemporary scientific and technological innovation and diversified communication media, the digital preservation and dissemination of cultural heritage are increasingly valued at home and abroad (Fang, 2016). The digital protection and promotion of embroidery skills benefit from the evolution of computer technology and the enhancement of global awareness of the protection of traditional cultural heritage. This field is both practical and innovative, covers multidisciplinary collaboration, and has broad development prospects (Lv, 2009). Due to its strong applicability, the digital protection and dissemination of cultural heritage at home and abroad are usually synchronized with research. In 1992, UNESCO launched the "Memory of the World" project, which preserves cultural heritage through digital means, which can not only achieve long-term inheritance, but also improve the public's accessibility to cultural resources. Internationally, the United States, Japan and other countries have successively implemented digital protection projects such as "American Memory" and "Japanese Memory"(UNESCO, 1992). In recent years, my country has also increased its investment in the digitization of cultural heritage, making it an important strategic direction for the protection and inheritance of cultural heritage.

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Southern Shaanxi is located between Qinba and is the ancient Silk Road and the "root" of the Qiang people (Cheng, 2012). The Qiang people have lived and lived in Ningqiang, Lueyang, Mianxian and other places in southern Shaanxi for thousands of years. The traditional Qiang embroidery art is rich and unique (He, 2013). "Southern Shaanxi Qiang" is a national cultural ecological protection experimental area (Ma, 2018). The topic was proposed under the background of the "Belt and Road Initiative". Taking "Southern Shaanxi Qiang Traditional Embroidery Art" as the research object is of great significance to promoting the comprehensive coordination and sustainable development of culture, economy and society in southern Shaanxi.

2. LITERATURE REVIEW

Even though many writers have written extensively about arts, Malay traditions and Malay heritage, on our part we shall try to gather and examine as much as we can on these subjects from various documents, books and even information that has been passed on orally from generation to generation. There are very few foreign studies on Qiang embroidery, and most of them are concentrated on the research of Sichuan Qiang embroidery (Li, 2018). Globally, the digital protection of cultural heritage has made significant progress. The virtual reality system developed by the Italian scholar Carrozzino team (2011) provides technical support for the digital inheritance of traditional crafts (Carrozzino, 2011). In Europe, France has systematically preserved precious documents through the digitalization project of the National Library and the "Cultural Digitalization 2030" plan. In North America, the "Digital Cultural Heritage" project launched by the United States integrates rich multimedia resources and uses digital technology to restore many important historical sites. In Asia, the "Digital Cultural Heritage" plan implemented by Japan not only reconstructs the appearance of the ancient capital, but also reproduces traditional festivals through virtual technology (Zhao, 2014). It is worth noting that the time-space simulation system (2008) developed by Japanese scholars successfully restored the grand occasion of the Gion Festival in Kyoto, providing new ideas for the protection of intangible cultural heritage (Liu, 2008). Regarding the research on the digital identity of intangible cultural heritage, the international academic community has a first-mover advantage. As early as the mid-20th century, Japan took the lead in establishing an intangible cultural heritage record preservation system when it revised the "Cultural Property Protection Law" in 1954 (Matsuoka, 1992). In specific practice, the University of Oz in Japan has carried out systematic digital archiving and protection work for the local characteristic intangible cultural heritage project - lion dance (Bourdieu, 2000).

In terms of digital protection and the current status of digital development of Qiang embroidery, more than 90% of Qiang embroidery research focuses on the Sichuan region, and there is a serious lack of attention to the Qiang migration areas in the west, such as Shaanxi and Gansu (Wang & Li, 2024). Through literature research and image analysis, the artistic symbols of Qiang embroidery were sorted out, and the types of digital development of Qiang embroidery and the establishment of the database were analyzed (Yang et al., 2020). Through digital technologies such as SIFT needle method extraction and AI needle method recognition, a Qiang embroidery service design model was proposed (Meng, 2021). Relevant research was carried out on the application paths of digital scanning, 3D modeling, etc. in the protection, inheritance and development of Qiang embroidery (Yin et al., 2023). In view of the unclear traceability of intangible cultural heritage artworks in my country, the small market demand, the small number of practitioners, and the lack of product promotion, the architectural idea of applying blockchain technology to the promotion platform of intangible cultural heritage artworks was proposed, in order to promote the inheritance and development of ethnic minority intangible cultural heritage artworks. In terms of digital identity practice, the National Taiwan University of Arts will combine NFT with ecology in 2022, with the theme of "Portrait of a Fish", and select 512 outstanding works as public welfare NFTs for sale, with about 50% of the proceeds used for technological and artistic innovation (Wu & Qu, 2025). Integrating Dunhuang art and culture into the design of NFT digital collections has realized the digital and living inheritance of traditional culture. The Palace Museum recently cooperated with Taiwan's NFT trading platform Lootex to release a series of co-branded NFT graphic art products, and cooperated with 8 original illustrators to promote the collections of the Palace Museum to the world. In terms of inheritance practice application, the Chinese Academy of Arts created the "China Intangible Cultural Heritage Network China Intangible Cultural Heritage Digital Museum" in 2006, and then 24 provinces

across the country successively established provincial intangible cultural heritage websites, initially forming a national and provincial intangible cultural heritage digital network system. In 2002, the National Library launched the "National Cultural Information Resource Sharing Project", using digital text, images, audio and other multimedia methods to store, display and inherit artistic resources. In 2008, the Palace Museum and IBM launched the "Virtual Forbidden City" project, using 3D modeling technology to restore the style of ancient buildings. In recent years, cultural institutions such as the Palace Museum have relied on traditional cultural IP, combined with games, animation, film and television, literature and social platforms, to develop cultural and creative products and digital content, so that traditional culture can be integrated into modern life in a new way. As of 2017, the Palace Museum's cultural and creative products have exceeded 10,000 types, with annual revenue of 1.5 billion yuan, successfully attracting the attention of young groups and realizing the innovative dissemination of traditional culture (Qin, 2023).

In short, the digital protection of cultural heritage abroad mainly relies on institutions such as libraries and museums, with the help of national financial and technical support. Its research focus is on using digital technology to restore art space, such as the application of virtual reality (VR) and augmented reality (AR) in the display of cultural heritage, emphasizing the deep integration of cross-cultural communication and digital technology. Domestic scholars have mostly focused on case analysis and explored the application of digital technology in the protection of specific cultural heritage, but have paid less attention to the actual promotion of digitalization in the development of traditional handicrafts (such as embroidery). In contrast, foreign research focuses more on technology integration and international collaboration. Therefore, this study can combine domestic and foreign experience to explore the application strategies of digital technology in the protection and innovation dissemination of traditional handicrafts to make up for the shortcomings of existing research.

This research is to the link between aesthetic philosophy and Malay elements in Malaysian visual arts. The author hopes to consolidate this information as knowledge and deploy it imaginatively in the pursuit of new ideas.

2.1 Types and artistic characteristics of Shaanxi Qiang Embroidery

The regional uniqueness of the traditional embroidery art of the Qiang ethnic group in southern Shaanxi is summarized from four aspects: Qiang embroidery shape, Qiang embroidery color, Qiang embroidery pattern, and decorative craftsmanship.

2.2 Patterned layout

The traditional embroidery of the Qiang people in southern Shaanxi forms a pattern in layout (Qian, 2012). Generally speaking, the traditional embroidery of the Qiang people in southern Shaanxi presents a sense of symmetry and balance in overall communication. It is arranged in an orderly manner in the form of axial symmetry or central symmetry, and adopts a relatively regular font skeleton, such as "rice", "field", "well", etc. It is very regular and well-behaved. Horizontal, vertical, 45° oblique lines, etc. are commonly used composition skeletons in Qiang embroidery. In the visual expression of embroidery art, the main picture composition mainly presents two basic forms: one is to use an independent and complete single pattern, and the other is to use repeated or continuous pattern combinations. It is worth noting that no matter what composition method is used, embroidery works generally follow the principles of symmetrical and balanced layout, and create a stable and solemn artistic effect and psychological feeling through equally distributed visual elements.

2.3 Diversified materials

Qiang embroidery in southern Shaanxi presents distinct multicultural characteristics in the selection of themes, which are mainly reflected in two major creative sources: artistic transformation of natural images. Embroidery artists are good at drawing inspiration from all things in nature. Their expression techniques can be divided into concrete expressions, such as independent depictions of animals (auspicious images such as sheep totems, phoenixes, and swimming fish) and plants

(flowers such as peonies and ram horns) (Shu, 2016). Image combination, mainly through composite compositions such as "Four Sheep Guarding Chrysanthemums" and "Butterflies in Love with Flowers", artistically conveys the ethnic group's sustenance for a better life. Abstract expression, mainly through the symbolic processing of geometric patterns, sublimates natural forms into visual languages with totemic significance (Zeng, 2015). Visual translation of religious culture Embroidery works incorporate primitive belief elements. For example, the use of the "卍" symbol is both a concrete expression of sun worship and a metaphor for the wisdom and light in Buddhist culture. This diversity of themes not only reflects the Qiang people's natural view of "all things have spirits", but also witnesses the historical process of the integration of multi-ethnic cultures. The evolution of embroidery patterns from concrete to abstract is essentially a visual encoding of the collective memory of the ethnic group. Most of these abstract elements are symbolized and have certain symbolism (Zhao, 2015). They are arranged in order to form a multi-angle or anti-logical spatial visual experience.

2.4 Fusion Needlework

The most essential part of the traditional embroidery of the Qiang people in southern Shaanxi is the needlework handed down by their ancestors (Yang, 2002). The traditional embroidery of the Qiang people in southern Shaanxi is mostly primitive and simple in appearance. The most commonly used needlework in the traditional embroidery of the Qiang people in southern Shaanxi includes straight needle embroidery, mixed needle embroidery, single hook embroidery, knitting needle embroidery, twisted needle embroidery, pressed needle embroidery, long and short needle super embroidery, frame embroidery, etc. The main pattern is generally made of straight needle embroidery, mixed needle embroidery and twisted needle embroidery, and frame embroidery is often used on the lace that is connected in all directions or continuous in all directions.

2.5 Layered Colors

The color choices in the traditional embroidery of the Qiang people in southern Shaanxi are mostly bright, colorful, and have a strong sense of layering (Xu, 2012). Qiang women in southern Shaanxi are accustomed to embroidering high-brightness pink sheep horn flowers in layers on low-brightness blue or black embroidery cloth. They use them as apron decorations in daily life, and they often appear on the shoulders and cuffs of clothing. The traditional embroidery of the Qiang people in southern Shaanxi is mostly in contrasting and contrasting colors, and mainly achieves harmony and unity through the transition of layers. There are generally two color matching rules: one is to arrange the same colors from dark to light in layers in terms of brightness, which produces a visual effect of shading; as shown in Fig. 1(left), the sheep horn flower shape in the Ningqiang Qiang Museum in southern Shaanxi, and (right) ①②③ respectively represent the pink lace, rose red petals, and dark red center of the flower. The colors of the same hue but different brightness promote the dark red center of the flower, rose red petals, and pink lace; the other is to directly contrast different hues, such as sky blue and rose red, bright red and white, etc. The use of contrasting colors creates a strong visual impact and shows the wonderful folk customs of the Qiang people in southern Shaanxi.



Fig 1. (Left and right) The colors of the horn flower in Shaanxi Ningqiang Qiang Museum

Source: Author

2.6 Current status of digital protection of Shaanxi Qiang embroidery

At present, the digitization of traditional embroidery art of the Qiang nationality in southern Shaanxi has played a huge role in the collection, preservation, repair, research, exhibition, education, and entertainment of the Qiang nationality's cultural heritage. However, according to the survey, some existing problems and deficiencies have also been found.

2.7 The degree of digitization is obviously insufficient

In the context of the rapid development of science and technology, the digital platform has effectively expanded the display form and service scope of traditional museums by virtue of its advantage of breaking through the limitations of time and space. It has become an important trend in cultural communication and has achieved remarkable results in my country. However, the digital construction of the Qiang nationality cultural platform in southern Shaanxi is still insufficient, and a unified standard for the digital collection of exhibits has not yet been established. The implementation of digital collection can not only improve the platform construction, but also assist the display through electronic equipment, so that the audience can obtain more intuitive and comprehensive exhibit information, thereby enhancing the interactive experience of traditional exhibitions. At present, the platform mainly relies on traditional display methods such as interpreters and text display boards. These methods have obvious limitations in information transmission efficiency and interactivity, and it is difficult to meet the diversified and personalized visiting needs of contemporary audiences.

2.8 Insufficient online publicity

In the information age, the Internet, as a key information dissemination medium, has important display and publicity functions for digital platforms. However, as a precious intangible cultural heritage, Shaanxi Qiang embroidery has obvious deficiencies and shortcomings in its online publicity. According to the latest survey data, the exposure of Shaanxi Qiang embroidery on mainstream online platforms is only 28% of that of Sichuan Qiang embroidery, and the annual update volume of related content on short video platforms such as Douyin and Kuaishou is less than 500. Specifically, it is manifested as follows: First, the publicity channel is single, mainly relying on government websites and a few cultural public accounts, and the presence is weak on platforms where young users gather, such as Weibo, Bilibili, and Xiaohongshu; second, the content quality is uneven, about 65% of the online materials are simple pictures with texts, lacking professional video production and creative planning; third, the interactivity is seriously insufficient, and the average number of comments per content on official accounts is less than 10, and the number of reposts is even lower at 2-3 times. This lack of online publicity has directly led to the limited popularity and influence of Shaanxi Qiang embroidery. In the Baidu Index, the search volume of "Shaanxi Qiang embroidery" is only 1/20 of that of "Shu embroidery", which seriously restricts its cultural dissemination and industrial development. What is more worrying is that the weakness of online publicity has caused the young group's awareness of Qiang embroidery to continue to decline. Among netizens aged 18-30, less than 15% can accurately describe the characteristics of Shaanxi Qiang embroidery.

2.9 The exhibition form is relatively single

At present, the exhibition form of Shaanxi Qiang embroidery shows obvious single characteristics. The digital protection platform of the Qiang embroidery art in southern Shaanxi integrates multiple functions such as cultural heritage protection, cultural communication, social education and public entertainment. The realization of these functions mainly relies on diversified exhibition forms. Based on their own characteristics, different platforms will organize special lectures, theme exhibitions and other special activities in addition to basic exhibitions to enhance the cultural communication effect in a rich form. Taking the Ningqiang Qiang Cultural Museum as an example, as a small and medium-sized local museum, it is difficult to continue to carry out theme activities due to its geographical location and visitor flow. It mainly relies on static exhibition methods, resulting in a lack of interactivity and memory points in the visiting experience, which affects the subsequent word-of-mouth communication effect. The development funds of the Qiang embroidery in southern

Shaanxi mainly come from the support of the government and cultural and tourism departments, and the source channel is too single. There is a lack of support and rewards for the creation of Qiang embroidery works, the creation of Qiang embroidery brands, the promotion of Qiang embroidery, e-commerce celebrity talents, the development of sports industry, and the protection and inheritance of intangible cultural heritage. The funds of local towns in southern Shaanxi are obviously insufficient, the entire industrial chain lacks risk resistance, and the degree of cultural and tourism integration is insufficient. These are not conducive to the healthy and orderly development of the cultural and tourism industry.

3. RESEARCH METHODOLOGY

Expert Consultations: Expert consultation was conducted to provide empirical evidence for Qiang embroidery. Through in-depth interviews with Qiang cultural research experts, scholars, inheritors, museum staff, designers and participants, this way further understand the artistic characteristics, inheritance status and existing problems of Qiang embroidery.

Field Research Method: Research the location of Qiang embroidery in Shaanxi province of China. Through going deep into Ningqiang County, Lueyang County and other places in Shaanxi Province, Collected pictures and samples of Qiang Embroidery, refined and classified them, and sorted out the first-hand oral materials and embroidery materials of the inheritors of Qiang Embroidery.

Empirical Method: Empirical research was conducted on practical projects to measure effectiveness. Apply a computer to Shaanxi Qiang embroidery digital products, and measure its effectiveness.

4. FINDINGS

This study found that digitized Shaanxi Qiang embroidery products and digitally innovative Qiang embroidery products generally have good themes, good craftsmanship, and meaningful meanings. The property rights of the embroidery products are clear, and Qiang embroidery is quickly disseminated and promoted, which has a positive effect on the inheritance of Shaanxi Qiang embroidery.

Table 1. Artistic characteristics of digital Shaanxi Qiang embroidery (degree of recognition)

No.	Respondent	Color	Composition	Material	Subject	Needlework	Connotation
1	Intangible cultural heritage inheritor	√	√	√	√	√	√
2	Qiang embroidery enterprise	√	√	√	√	√	√
3	Government researcher	√	√	√	√	√	√
4	Embroiderer	√	√	√	√	√	√
5	Collector	√	√	√	√	√	√

5. RESULTS

5.1 Establish a database

As an important cultural protection tool, the design of the Southern Shaanxi Qiang Embroidery Database needs to take into account both system architecture and content depth. In terms of content structure, the database should include seven core modules: the cultural background database systematically sorts out the historical origins, regional distribution and development context of Qiang embroidery; the pattern database includes typical patterns of traditional Qiang embroidery, including representative patterns such as sheep horn flowers and cloud patterns, and each pattern needs to be marked with its cultural meaning and usage scenarios; the needlework technology database records in detail traditional techniques such as embroidery, flat embroidery, and gold plating, and displays the complete production process through high-definition

video; the clothing application database collects application examples of Qiang embroidery on long gowns, aprons, headscarves and other clothing; the inheritor archives establish information archives of intangible cultural heritage inheritors, record their skills and inheritance pedigree; the academic research database integrates relevant research documents, monographs and video materials; the cultural and creative product database displays modern design works.

5.2 Building a digital museum

Building a digital platform and using new media communication channels are important measures to promote the widespread dissemination of Qiang embroidery art in southern Shaanxi (Yuan, 2012). Building an official website can not only provide basic information services, but also enhance the publicity effect through multimedia display, laying the foundation for the construction of a digital museum. At the same time, by leveraging the advantages of social media communication, visitors are encouraged to share their experiences and form a virtuous cycle of word-of-mouth communication, which is crucial to enhancing the influence of museums. In addition, innovative display forms such as creating a Qiang theme park, revitalizing the exhibition content through short videos, interactive activities, etc., allowing the audience to immerse themselves in the Qiang folk culture, can not only enhance the fun of visiting, but also contribute to the living inheritance of intangible cultural heritage skills. In particular, it is necessary to develop a "digital twin embroidery workshop" to synchronize the temperature, humidity, light and other environmental data of the physical museum in real time to provide decision-making support for cultural relics protection (Xie, 2016). Using digital tools 3D scanning (for three-dimensional embroidery modeling), high-definition photography, AR/VR (virtual display), blockchain (copyright protection), with the help of platform architecture, website + applet + offline interactive terminal, support multiple languages (Chinese, Qiang, English). The construction of the Shaanxi Qiang Traditional Embroidery Digital Museum is an innovative project that integrates cultural heritage protection, digital technology and cultural communication, aiming to preserve, display and promote Qiang embroidery, a national intangible cultural heritage, through digital means.

5.3 Create a public account interactive platform

Today, as the wave of digitalization sweeps the world, the rapid development of Internet technology and the continuous increase in the national Internet access rate have made digital technology deeply penetrate into all areas of social development (Sannikova, 2024). As an important part of China's excellent traditional culture, ethnic minority culture plays a unique and key role in the cultural inheritance system. However, due to the constraints of multiple factors such as historical conditions and regional environment, the traditional embroidery art of the Qiang people has long been confined to the traditional communication mode of word of mouth. Although this interpersonal communication method has cultural authenticity, it has obvious limitations in terms of communication breadth, depth and influence (Zhao, 2024). It is worth noting that the emergence of new media platforms represented by Tencent QQ, Weibo and WeChat is opening up a new space for the dissemination of ethnic minority culture and creating unprecedented development opportunities. These platforms not only break the limitations of time and space, but also provide an important carrier for the modern dissemination of intangible cultural heritage such as Qiang embroidery through diversified dissemination forms. As the most influential social media platform at present, WeChat has remarkable user coverage and activity. Data shows that WeChat has covered more than 90% of smartphone users in my country, with monthly active users reaching 549 million. The total number of WeChat public accounts has exceeded 8 million, with 89% of users following it.



Fig. 2. Official account

Source: Author

5.4 Digital Innovation Design

The case starts with the composition and material of "Ningqiang Qiang Embroidery", combines the transformation of Qiang embroidery needlework and color, and analyzes the artistic uniqueness of Ningqiang Qiang Embroidery. Using computer-aided design software, innovatively design new Qiang embroidery tourism products to meet the combination of "intangible cultural heritage +" Qiang culture and modern tourism products, which has a positive effect on building a Qiang cultural tourism city in southern Shaanxi. The following is a case completed by the host and team members.

5.4.1 Case 1: Qiang Embroidery + Hanjiangyuan Scenic Area Tourism Products (Staff Clothing)

This case was designed and produced for the Hanjiangyuan Scenic Area by the project leader and team members under the leadership of the Ningqiang County Cultural and Tourism Bureau. The Hanjiangyuan Scenic Area is located in the Qiang ethnic group settlement area in southern Shaanxi, where natural scenery and Qiang culture complement each other. As a national intangible cultural heritage, Qiang embroidery has become an important carrier of Qiang culture with its gorgeous colors, abstract geometric patterns and profound totem meanings. This design takes "Qiang embroidery + Hanjiang ecology" as the core, combining traditional handicrafts with modern outdoor functional clothing, so that the scenic area work clothes can not only meet the actual needs of employees, but also become a mobile exhibition hall for spreading Qiang culture. In terms of pattern selection, the classic "cloud pattern" and "ram horn pattern" of the Qiang people are used to symbolize the worship of nature, supplemented by "water ripples" and "vine patterns" to echo the landscape of the source of the Han River, forming a visual narrative of "harmony between man and nature". The colors are based on dark blue and dark green, which are both calm and solemn, and secretly match the verdant mountains in the Hanjiang River Basin. The embroidery is embellished with traditional Qiang embroidery colors such as vermilion and indigo to enhance the visual impact. This project is currently being implemented. The production of female staff has been completed, and the clothing of male scenic area staff is being implemented, as shown in Fig. 3.



Fig. 3. Innovative design of Qiang embroidery
Source: Author

5.4.2 Case 2: Qiang Embroidery + Qiang Culture Tourism Products (Qiang Dance Costumes)

This series of Qiang culture tourism products was designed and produced by the project team members. The inspiration for the products comes from the Qiang Village Blockhouse Building Complex and the personal sensory experience of the colorful Qiang embroidery. Qiang Village is the concentrated embodiment of Qiang culture. After a field investigation of the Qiang Village Blockhouse Building Complex, it was found that they have great architectural beauty. The A-shaped building, protruding windows, and the walls all built up by layers of stones have imprinted the historical changes of the Qiang people and have a unique sense of the times. In the design of clothing structure, the principles of architectural mechanics are applied to the pattern development. For example, the bias-cut coat with the A-shaped structure of the Qiang Village has a shoulder slope precisely controlled at 58° , which not only restores the architectural characteristics but also meets the requirements of ergonomics. As shown in Fig. 4. The cultural value of this series of products is not only reflected in the aesthetic expression, but more importantly, a set of replicable intangible cultural heritage innovation methodologies has been established. By cross-integrating multidisciplinary knowledge such as architectural archaeological data, material science, and digital technology, a new paradigm is provided for the contemporary transformation of traditional cultural resources. Sales data show that 68% of consumers who purchased this series of products have developed a desire to deeply understand the Qiang culture, realizing a virtuous cycle of cultural communication and commercial value. This fully proves that the combination of in-depth cultural excavation and innovative design expression can effectively activate the contemporary vitality of traditional culture.

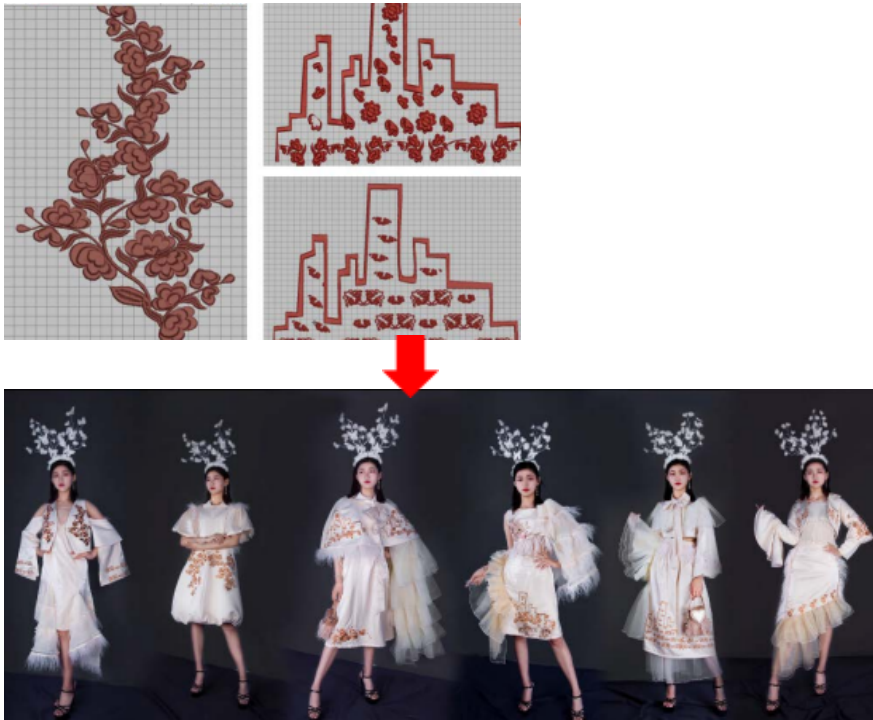


Fig. 4. Innovative design of Qiang embroidery
Source: Author

5.4.3 Case 3: Qiang embroidery + Internet celebrity tourism products (car waist pillow)

This case was designed and produced by the project leader and team members for Ningqiang County Qiangzhou Embroidery Culture Co., Ltd. Ningqiang Internet celebrity product car waist pillow. The product selects the most representative "ram horn pattern" and "cloud pattern" of the Qiang people as the core pattern, symbolizing the harmonious coexistence of auspiciousness and nature; supplemented by Ningqiang local characteristic patterns such as "camellia" and "vine pattern", reflecting the uniqueness of regional culture. The color scheme uses the traditional high-saturation color scheme of Qiang embroidery, such as vermilion, indigo, and bright yellow, to create visual impact through contrasting color design, while retaining the calm background colors such as navy blue and dark green to ensure coordination with the interior styles of various cars. Currently implemented, as shown in Fig. 5.



Fig. 5.(left and right) Car lumbar pillow
Source: Author

5.4.4 Case 4: Qiang embroidery + 3D virtual fitting

This design takes the Ningqiang Qiang embroidery, a provincial intangible cultural heritage of Shaanxi Province, as the core element, and relies on the Style3D virtual fitting software platform to build a digital solution that integrates cultural display, virtual fitting, and personalized customization. Through field surveys, it is analyzed that the themes of Qiang embroidery patterns are wide-ranging, roughly divided into plant patterns (such as azaleas, peonies, chrysanthemums, vines, etc.), animal patterns (such as sheep, cows, chickens, butterflies, fish, birds, etc.), geometric patterns (such as triangles, straight lines, oblique lines, wavy lines, etc.) and other patterns (such as daily utensil pottery, sun, moon, stars, swastika patterns, auspicious characters, etc.). Overall, floral patterns are the most common, followed by animal patterns. Import the two-dimensional paper pattern in Fuyi CAD into the Style3D virtual fitting system, adjust the details of traditional embroidery clothing in the simulation state, and obtain a preliminary 3D view of the long gown. In the future, it is planned to connect to the Metaverse ecosystem. Users can collect digital Qiang embroidery collections in the form of NFTs, participate in online virtual fashion shows and other activities, and continue to expand the modern expression space of intangible cultural heritage.

5.5 Digital Communication Promotion

“Museum +” and “Cultural Relics +” allow tourists to touch history. Use technological means to immersively reproduce the historical scenes of Qiang culture, launch a series of themed cultural activities called “Qiang Embroidery”, especially historical experience projects with NPCs (a type of character that promotes the development of the plot in the game) in large ruins, so that the general public and tourists can travel through time and space, talk to ruins, and touch history. Launch “Museum +” and “Cultural Relics +” multi-integrated products. Ningqiang Qingmichuan and Hanshuiyuan Scenic Area can launch Qiang embroidery tourism performances, etc. Use technological means to immersively reproduce the historical scenes of Qiang embroidery, which has been widely praised.

6. CONCLUSION

This project studies the traditional embroidery art of the Qiang people in southern Shaanxi, and mainly draws the following four points:

- Digitalization is the only way for Qiang embroidery to be “livingly inherited”. The traditional oral transmission model faces the risk of aging inheritors and loss of skills. Digitalization (3D modeling, VR teaching, AI pattern library) can permanently preserve core skills such as needlework and patterns, and achieve global dissemination through the Internet.
- Youthful expression is the key to breaking the circle. Qiang embroidery needs to break away from the stereotype of “intangible cultural heritage = old” and attract Generation Z with the help of national trend IP co-branding (such as games, animations) and short video challenges (TikTok #Qiang embroidery DIY) to promote the “fashionization of intangible cultural heritage”. Create a multimedia interactive platform (live broadcasts by internet celebrities, VR, 3D technology).
- Technology empowerment improves industry efficiency. Digital technology innovation design (expanding consumer groups, mixing and matching popular elements, expanding product categories, “intangible cultural heritage”, improving quality through details). By expanding the consumer group, precise digital marketing. Analyze user preferences through e-commerce platforms (Taobao, JD.com) and social media (TikTok, Xiaohongshu), and recommend customized content for different groups; mix and match popular elements, conduct digital cross-border design, and cooperate with 3D clothing design software (Style3D) to create “digital Qiang embroidery fashion”; expand Qiang embroidery product categories and conduct digital derivative development; develop the “intangible cultural heritage +” model and create digital ecological integration; use

digital technology to improve the accuracy and production efficiency of embroidery products, and improve quality through details.

- The international dissemination of Qiang embroidery needs to leverage China's "Belt and Road Initiative". Through multilingual digital museums, cross-border e-commerce (Amazon Intangible Cultural Heritage Zone), and international cultural festival VR exhibitions, Qiang embroidery will be promoted to Central Asia, Europe and other countries along the "Belt and Road", strengthening the export of Chinese excellent culture.

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CONFLICT OF INTEREST STATEMENT

The author declares that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHORS' CONTRIBUTIONS

Fangqin Zheng: Conceptualisation, methodology, investigation, data curation, formal analysis, writing—original draft preparation; Muhamad Fairus Kamaruzaman: Supervision, validation, writing—review and editing, correspondence; Rusmawati Ghazali: Methodology guidance, validation, writing—review and editing.

ETHICS STATEMENT

This study was reviewed and approved by the Research Ethics Committee of Universiti Teknologi MARA (UiTM) (Approval No: REC/12/2024 (PG/MR/620)).

All procedures involving human participants were conducted in accordance with institutional ethical standards and the principles of the 1964 Helsinki Declaration. Informed consent was obtained from all participants, and data anonymity was strictly maintained throughout the study.

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