

# The Design of Practice on Wicker Intangible Cultural Heritage Skills in Public Art Based on Sustainable Design Concepts

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## Abstract

The rapid development of China's urbanization process has, on the one hand, caused the intangible cultural heritage wicker weaving skills to face difficulties in the protection and inheritance, and on the other hand, promoted the vigorous development of urban public art. This study attempts to intervene the traditional willow weaving skills into the field of public art, and promote the inheritance and development of willow weaving skills in the city through the integration and innovation of willow weaving traditional skills in public art. The research goal: Based on sustainable design theory, demonstrate the practical creation of traditional willow weaving skills in public art in first-tier cities in Shanghai. First, based on literature research, fieldwork on intangible cultural heritage wicker weaving, and in-depth interviews with young users in Shanghai, the research results on the four sustainability dimensions of culture, environment, economy, and society were sorted out. The focus is on analyzing and discussing the attitudes and evaluations of young users in Shanghai on the four dimensions; Secondly, the "Magic City Rubik's Cube" - a wicker public art concept plan was designed and created, and the work was specifically displayed from the four dimensions of cultural sustainability, environmental sustainability, social sustainability, and economic sustainability ;The final research results show that young users in Shanghai pay more attention to the cultural sustainability of wicker public art, hold a positive attitude towards environmental sustainability throughout the life cycle of LCA, and are more willing to accept innovative applications of new technologies and new materials in wicker public art. Research contribution: For the first time, the creative process of traditional willow weaving skills in public art is demonstrated, providing an important reference for the sustainable innovation of intangible heritage traditional skills in the field of public space.

**Keywords:** The Design of Practice; Wicker Intangible Cultural Heritage Skills; Public Art; Sustainable Design Concepts

## Introduction

Since the industrial revolution, the overuse of resources has led to the rapid reduction of natural resources, and 86% of the world's population lives in an ecologically innocent country (WWF, 2018). While our country has achieved world-renowned economic achievements, it has also paid a huge price for resources and the environment, and there is a serious imbalance between environmental protection and economic development (Wang & Guo, 2016). "Sustainable design is the systematic thinking and coordination of the connotation and relationship of design-related elements based on sustainable development (Hila, Adela, & Meret, 2016) The basic logic of the development and evolution of sustainable design is from the technologically oriented product individual Green design has gradually developed into a large-scale systematic innovation with a humanistic orientation, including the three sustainable dimensions of environment, economy and society (Ceschin & Gaziulusoy, 2016).

Huaihe willow weaving is an intangible cultural heritage of China, and its rich and varied weaving patterns are a good display of local regional culture. Many traditional weaving techniques are currently in a state of elimination with no one to inherit them because they cannot adapt to contemporary life and market needs (Chen, 2020). Taking Funan willow weaving as an example, currently there is only one national-level intangible cultural heritage inheritor left, Wang Wenzhong, one provincial-level intangible cultural heritage inheritor, and eight municipal-level intangible cultural heritage inheritors, and the average age is over 50 years old (Sun, Yang & Ren, 2019). Therefore, how to protect and inherit the intangible cultural heritage willow weaving skills is a major issue facing the development of willow weaving in Huaihe River.

As an important carrier of urban spirit, public art is an important way to create and enhance urban aesthetic quality, balance the ecological environment, and improve people's quality of life. It is also an important way to understand and perceive urban culture (Zhou, 2013; Sun, 2021) At present, the development of new products of traditional willow weaving skills is mainly concentrated in a single product field. It is rarely used in public spaces, especially in the form of public art in urban parks, urban public blocks, urban communities, commercial public spaces and campus public spaces. As an international metropolis, Shanghai has always been at the forefront of China in terms of urban construction and public art creation. Therefore, this article attempts to explore more possibilities for the innovative development of the traditional willow weaving skills and public art in the first-tier cities of Shanghai.

The research contribution of this article: for the first time, it demonstrates the creative process of traditional willow weaving skills in public art, providing an important reference for the sustainable innovation of intangible heritage traditional skills in the field of public space. At the same time, it also provides technical guidance for other intangible cultural heritage techniques to be involved in urban public art.

The overall structure of the article is as follows: the first part is the introduction; the second part is the literature review; the third part is the research method; the fourth part includes results and discussions, showing the creation process of willow weaving public art, focusing on analyzing the specific embodiment of willow public art works in the four dimensions of culture, environment, society and economy; the fifth part is the conclusion.

## Research Objectives

To demonstrate the design creation method of traditional willow weaving skills in public art based on sustainable design theory.

## Literature Review

In recent years, with the revival of Chinese traditional culture, the survival and sustainable development of culture have become key issues facing the intangible cultural heritage industry (Chen Ma, & Teng, 2013). Many scholars have analyzed and thought about cultural sustainability from different dimensions in the fields of traditional skills, intangible cultural heritage, tourism culture, corporate culture, urban protection and other fields. For example, Tang Xiaoying et al. (2023) conducted research on the sustainable dissemination of lion dance digital virtual cultural IP; Chen Xiang (2022) et al. proposed culturally sustainable countermeasures for cultural and creative products; Zhao Xiaoyue & Zhang Lin. (2022) proposed a systematic strategy for cultural sustainable design; Zeng Chaohui (2021) conducted a study on the cultural heritage excavation and sustainable design of traditional villages in Guangfu, China; Li Qi (2021) and others conducted in-depth research on the redesign and practice of waste leather from the perspective of brand culture construction. Existing literature research proves the feasibility and importance of culturally sustainable design. From the triple bottom line of economy, environment and society to the sustainable development of cultural dimension, the connotation of sustainable design is constantly enriched and expanded.

The article was searched on the web of sciences using the keywords Sustainable Design and traditional craft, and a total of 73 related journal articles and conference papers were found. Researchers have mainly studied the sustainable development of traditional skills from the perspective of social innovation, participatory design, inheritor sustainability, digital design, business and consumer perspectives, and material sustainability. The author combed the relevant literature from 2010 to 2023, analyzed the co-occurrence of citations in the literature through Cite space software, and found that the authors of relevant research on sustainable design and traditional skills are relatively scattered, and the connection between the authors is not strong (As shown in Figure 1). There are few studies on the sustainable design of cultural heritage and sustainable design and creation of traditional techniques. In particular, there is almost no research on the sustainable design application of willow weaving techniques.



## **Research Methodology**

### **1. Sample collection**

In order to conduct an in-depth study of the current status of Huaihe's traditional willow weaving skills and the attitudes of young users in Shanghai towards the sustainable application of willow weaving skills in public art, this sample collection includes Huaihe willow weaving inheritors and young users aged 18-38 in Shanghai.

#### **1.1 Collection of relevant samples from inheritors of Huaihe willow weaving intangible cultural heritage skills**

The sample collection location is Huanggang Town, Funan County, Anhui Province. As the birthplace of Chinese willow weaving, this area is known as the "Hometown of Chinese Willow Weaving" and "The Willow Weaving Capital of China". In order to gain a deeper understanding of the history and current status of Funan willow weaving skills, in-depth interviews were conducted with the inheritors of intangible cultural heritage willow weaving and Huanggang Town Government staff to obtain first-hand information.

Currently, there are 10 inheritors of intangible cultural heritage willow weaving at the national, provincial and municipal levels in Funan County. Among them, national-level willow weaving inheritor Wang Wenzhong founded Anhui Huayu Crafts Co., Ltd.; provincial-level inheritor Sun Chuangui, and municipal-level inheritors are Yang Fuxi, Chen Ziyu, Meng Xiangrong, Xu Zhihe, Gao Jijia, Cheng Yangshan, Ma Zhenxiu, Sun Chuanjin, etc. The in-depth interview was conducted with 5 people, mainly to conduct in-depth analysis and investigation of the current development status and future development of willow weaving, and to provide important basic information for the subsequent public art creation of willow weaving.

#### **1.2 Sample collection of young users in Shanghai area**

The sample collection location is: No. 3098 Wahong Highway, Fengxian District, Shanghai. The survey population is young people aged 18-38. Through site research and user research, in-depth interviews were conducted on the application of traditional willow weaving skills in public art, and on this basis, the interview content was sorted out. The content of this in-depth interview mainly focuses on the four dimensions of cultural sustainable innovation, environmental sustainable innovation, economic sustainable innovation, and social sustainable innovation of willow weaving public art. The content of this in-depth interview mainly focuses on the cultural sustainability, environmental sustainability, economic sustainability and social sustainability of willow public art.

### **2. Sampling method**

#### **2.1 On-site research and in-depth interviews with willow weaving inheritors**

Through field surveys and in-depth interviews in the hometown of willow weaving in Funan County, Anhui Province, an overall analysis of the current development status of traditional willow weaving skills was conducted. This survey visited 10 willow weaving companies, inspected 3 willow weaving villages, and conducted in-depth interviews 5 craftsmen and relevant government staff, the interview results are shown in Table 1.

**Table 1.** Interview form on current situation of willow weaving inheritors

Category	Main content
Willow weaving material	The willow produced in the Huaihe River Basin has high toughness and is stronger and more durable than the willow produced in other places. This has also become an important basis for the reputation of Huaihe willow weaving products at home and abroad.
Current status of willow weaving inheritors	The inheritance of willow weaving is in crisis. Farmers' income from knitting products is relatively meager, generally ranging from 50 to 100 yuan a day. After excluding costs, the average monthly income is about 2,000 yuan. This has led to many young people preferring to work outside the home rather than engage in wicker weaving at home. At present, most willow weaving craftsmen are over 50 years old, and many traditional weaving techniques are facing loss.
Current situation of willow weaving enterprises	Willow weaving companies mainly focus on OEM processing and lack independent innovation. Currently, 90% of their products are mainly exported to Europe, the United States, Japan, South Korea and other places. The domestic market development is seriously insufficient, mainly due to the lack of understanding of the domestic market and the lack of effective means such as the operation and management experience of online stores and live broadcasts.
Current status of wicker products	At present, the categories of wicker products are relatively rich, reaching more than 2,000 types, 80% of which are concentrated in the field of household products, and the other 10% are in the pet nest, outdoor furniture and other markets, and the rest are scattered in the fields of restaurant trays, decorations and other fields. There is almost no reference to the public art field of willow weaving.
Related policy	In the past five years, my country has promulgated a number of policies related to the protection of intangible cultural heritage and traditional crafts, such as the "Opinions on Further Strengthening the Protection of my country's Intangible Cultural Heritage" and the "Plan for the Revitalization of Chinese Traditional Crafts", which have promoted the protection of intangible cultural heritage and crafts and inheritance; at the same time, the local government has also introduced a number of policies to support the development of the willow weaving industry, such as the "Start of Construction of the Huanggang Willow Weaving National Geographical Indication Product Protection Demonstration Zone", "Funan County's "Addition, Subtraction, Multiplication and Division" Method Fully serve the willow weaving enterprises", "Funan County takes multiple measures to support the high-quality development of the willow weaving industry", etc.

Source: Author

### 2.2 In-depth interview sampling of young users in Shanghai area

This interview mainly focused on young people aged 18-38 in Shanghai. A total of 15 people were interviewed in depth: 7 men and 8 women. 40% are aged 18-20, 35% are aged 21-24, 20% are aged 25-30, and 5% are aged 31-38. In-depth interviews were conducted around the four sustainable innovation dimensions of culture, environment, economy, and society. The interview results are as follows (Table 2):

**Table 2.** User in-depth interview statistics table

Four dimensions	Interview questions	Interview results	Importance
Culturally sustainable	Should design works improve the characteristics of urban public spaces through cultural value-added innovation?	Young users generally believe that design works should focus on value-added innovation of local culture and enhance the regional characteristics of urban space through value-added innovation.	More important
	Should design works focus on the integration and innovation of intangible cultural heritage skills and Shanghai's local culture?	Young users have shown a strong interest in intangible cultural heritage skills and hope to protect and inherit intangible cultural heritage skills through the integration and innovation of intangible cultural heritage skills and local culture.	Very important
	Should design works pay attention to the fashionable and modern expression of intangible cultural heritage skills?	Young users like to follow fashion trends and strongly hope that design works can modernize fashion elements and traditional techniques.	Very important
	Should design works have some educational significance?	Young users believe that the educational significance of design works should be expressed through metaphors, and suggest that the educational function of the work should not be overemphasized.	Generally important
Environmentally sustainable	Should design works be highly adaptable to the site?	Young users believe that design works should pay attention to the local attributes of the site, advocate the independence and particularity of the work, and have an indifferent attitude towards the adaptability of the same work in different sites.	Generally not important
	Should design works	Young users strongly believe that	Very

	focus on the LCA full life cycle design of wicker public art (that is, the entire link of design-production-installation-disassembly, recycling, and reuse)?	design works should focus on being friendly to the surrounding environment and minimizing damage to the surrounding environment, and strongly support LCA life cycle design.	important
	Should the design be continually updated over time?	Young users believe that design works should be updated as time changes, and it is recommended to do so in the form of partial updates.	Generally important
Economically sustainable	Can design works not only beautify the city, but also generate economic benefits and promote rural revitalization?	Young users generally do not pay special attention to the economic benefits generated by design works, and believe that the important function of design works is to highlight the characteristics of the city.	Generally not important
	Should design works be as cost-effective as possible and adopt modular production and installation?	Young users generally believe that design works should save costs as much as possible. From an environmental perspective, the use of modular installation methods greatly reduces pollution to the surrounding environment.	More important

Socially sustainable	Should design works pay attention to new technologies, new materials and traditions? Integration and innovation of skills?	Young users strongly believe that it is crucial to integrate and innovate traditional techniques with new technologies and new materials in design works, so that the fashion and modernity of the works can be better highlighted.	Very important
	Should design works focus on the application of new media, such as smart phones? Interaction and display design?	Young users believe that design works should focus on the application of new technologies and new media methods, and focus on intelligent interactive experience.	More important
	Should design works focus on the new dissemination of intangible cultural heritage skills, such as	Young users generally believe that intelligent interaction and display design should be paid attention to in design works, and it is recommended to integrate and innovate digital imaging	Very important

	Digital images?	and digital technology to promote digital dissemination of intangible cultural heritage skills.	
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Source: Author

### 3. Research methods

This study mainly adopts qualitative research techniques. First, it conducts field investigation on the current situation of Huaihe willow weaving in Huanggang Town, Funan County, Anhui Province and conducts in-depth interviews with intangible cultural heritage inheritors to sort out the development status of intangible cultural heritage willow weaving skills. Secondly, it establishes a team of 10 people. The focus group, based on the theory of sustainable design, discussed the four dimensions of sustainable design of intangible cultural heritage willow weaving techniques in public art, drafted relevant interview outlines, and conducted in-depth interviews with young users aged 18-38 in Shanghai to obtain the true attitudes of young users; finally, the research results are analyzed and discussed in the four dimensions of culture, environment, society, and economy, and on this basis, the "Magic City Rubik's Cube" wicker public art concept design plan is created.

## Results

### 1. Cultural sustainable innovation is the basic principle of design creation

From Table 1, we can see that most of the current intangible cultural heritage willow weaving skills are processed by OEM orders, and design innovation is seriously insufficient. The main reason is that traditional willow weaving craft products are difficult to adapt to today's production and lifestyle, and traditional intangible cultural heritage craft culture is difficult to deeply integrate with modern design culture. There are few changes in willow weaving categories, and the traditional willow weaving skills have almost no applications in public spaces, especially in public art.

From Table 2, we can see that young users in Shanghai have a strong support for sustainable cultural innovation. They believe that the sustainable innovation of traditional willow weaving skills in public art should fully respect local culture and integrate international fashion culture and trend culture. This provides an important foundation for the sustainable development of willow weaving public art. Young consumer groups prefer to pursue new consumption forms such as fashion trends, appearance consumption, and emotional consumption (Li, 2022). Young users pay more attention to the integration and innovation of fashion and trend culture in wicker public art. The younger generation, especially the consumer group of the millennium, obtains identity and emotional satisfaction by endowing the culture behind public art (Jiang & Ji, 2021). In the creation of design practice works, we should focus on exploring the local culture of Shanghai and deeply integrating it with the traditional willow weaving skills and culture to reflect the fashion, modernity and culture of public art.

**2.The integration and innovation of new technologies and traditional skills will become an important guarantee for the sustainable development of society.**

Through field investigation, we found that most willow weaving enterprises currently adopt traditional processing models, and there is almost no application of new materials and new technologies, especially the interactive design of information technology and willow weaving skills. From Table 2, we can see that young users have a special preference for new technologies and strongly hope to integrate information technology in the creation of design works, and deeply integrate and develop traditional skills with big data, the Internet, blockchain, etc., so as to realize intangible cultural heritage spread and inheritance of skills in Shanghai's urban space. The new generation of consumer behavior is a combination of rationality and sensibility, and has a strong sense of participation (Chang, 2012) The application of new technologies provides technical support for new forms of public art, enhances the interest of space, and allows more young users to enhance their digital emotional experience in space through intelligent interaction with public art (Sun, 2014). Therefore, in the creation of willow weaving public art, we should keep up with the trend of the information age, fully cater to young users' favor for new technologies, and enhance the information interaction of the works and the users' emotional experience.

**3.Environmental sustainability is an important prerequisite for wicker public art design creation**

Through fieldwork and in-depth interviews with willow weaving inheritors, we found that willow weaving craftsmen believe that willow weaving products themselves are a model of sustainable design, and that the entire stage from material selection to peeling to weaving to scrap reflects a friendly attitude towards the surrounding environment. As the concept of sustainable development becomes more and more popular, the new generation of users has become more aware of environmental protection. From Table 2, we can see that young users in Shanghai generally believe that more attention should be paid to the protection of the surrounding environment in the design and creation of willow weaving public art. Sustainable design encourages the use of recyclable, explainable, and recyclable design materials, insists on starting from the full life cycle of LCV, establishes its own circular economy sustainable recycling system, and ultimately achieves the harmonious development of man and the environment (Yu & Wang, 2016; Sun, 2019). Therefore, in the creation of wicker public art, the full life cycle of LCA should be adhered to, recyclable and recyclable biological materials should be used, and traditional skills can be realized in the public through local renewal. Sustainability in the Arts.

**4.Economic sustainability is a secondary condition for the creation of willow public art design.**

In recent years, the national and local governments have introduced a number of relevant policies (Table 1) to promote the protection and development of intangible cultural heritage skills. The implementation of these policies not only provides an important guarantee for the development of local willow weaving enterprises, but also protects the local economic development driven by the willow weaving industry. From Table 1, we find that the income of traditional willow weaving craftsmen is meager and very unstable, which directly leads to the reluctance of many young people to engage in willow weaving skills, causing the intangible cultural heritage wicker weaving to face a crisis of inheritance.

Economic sustainability is one of the important ethics of sustainable design. On the basis of adhering to the circular economy theory (Hapuwatte & Jawahir, 2021), it is key to drive the development of local industries and continuously increase the income of local residents through the innovative design of willow weaving skills and public art. Young people aged 18-38 are the generation that grew up after China's reform and opening up, especially those born after 2000, and their family economic conditions have significantly improved. Therefore, this group of young people, especially those in Shanghai, pay more attention to the environmental, social and cultural values of willow weaving public art, while the economic value becomes relatively less important (Table 1). This is in line with the economic consumption concepts of modern young people, that is, young consumers prefer art works with a sense of design and fashion, and price is not the most important consideration (Liu & Wan, 2020). Therefore, in the creation of willow public art, we should pay more attention to modularity, give full play to the weaving skills of willow craftsmen, let young people like and be willing to engage in this skill, and drive local economic development through willow design innovation.

## Discussion

Based on the analysis of the research results of the four dimensions of culture, environment, economy and society in the sustainable design of wicker public art, this paper takes the wicker public art design work - "Magic City Magic Cube" as an example for discussion.

### 1. The integration and innovation of willow weaving culture and local culture is an important condition for achieving sustainable development of willow weaving public art.

As one of the important weaving techniques in China, willow weaving has a history of more than 7,000 years. There are more than 20 traditional weaving techniques, including flat weaving, binding weaving, standing weaving, winding weaving, back weaving, mixed weaving, etc. (Table 3). With the process of industrialization and the transformation of modern lifestyles, many traditional weaving techniques are in a state of elimination without successors because they cannot adapt to contemporary life and market needs (Chen, 2020)

**Table 3** Display of traditional willow weaving skills

Weaving techniques	Content	Picture display
Flat weaving	Flat knitting is mainly made by interpenetrating and stacking warp and weft threads and used for weaving baskets or buckets.	
Straight weaving	Straight weaving is a traditional wicker weaving type of work. The hemp rope is used as the warp and the wicker as the weft. The hemp rope is interlaced and passed through the wicker.	

	Commonly found in dustpans, fence buckets, bamboo baskets, etc.	
Winding weavin	Generally, the warp is woven with wicker first, and the weft is made of wicker to surround the warp. As the weft rotates and changes direction, the texture appears to be the rotation of the weft and the weft is wrapped side by side. Commonly found in the handles of woven utensils.	
Back weaving	Back knitting is to interweave wicker in a triangular or trapezoidal shape on the warp or weft after fixing the warp or weft. Commonly used in woven baskets.	
Vertical weaving	The warp knitting is completed first, and then the wicker is knitted around the warp. After the weaving is completed, only the weft knitting is visible, but no warp knitting. Often used in weaving baskets and other utensils.	
Mixed weaving	Mixed weaving is a combination of other weaving methods or weaving materials, which has strong flexibility and autonomy. Often used in the bottom, sides or edges of weaving utensils.	

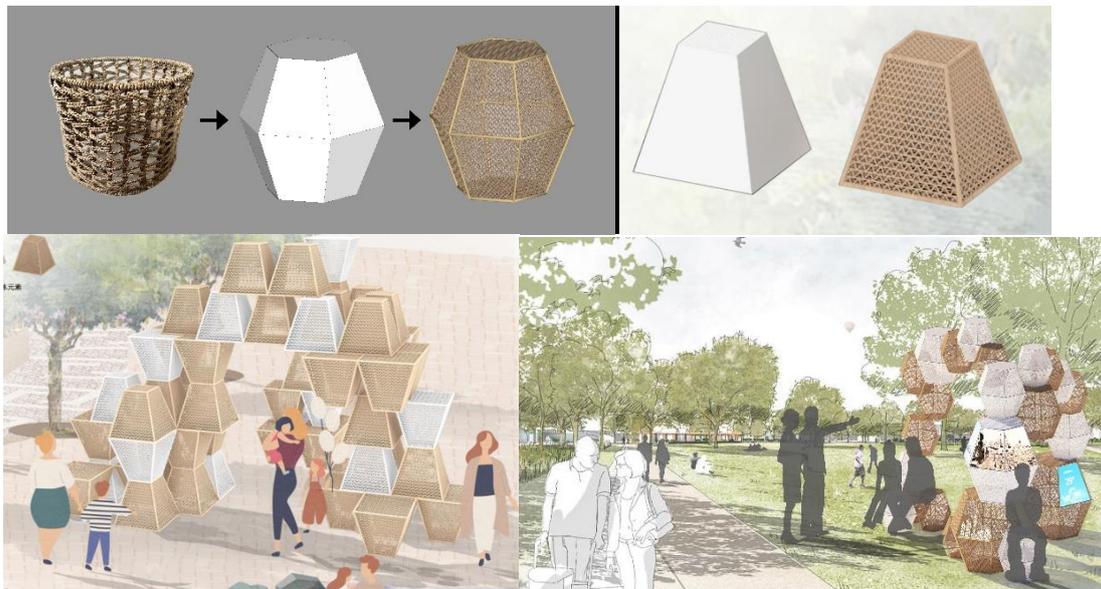
Source: Author

At present, 90% of willow weaving products are concentrated in the fields of household products, daily necessities and wall decorations. However, there are very few application cases and related research of traditional willow weaving skills in public spaces such as hotels, restaurants, clubs, shopping malls, etc. Therefore, intangible cultural heritage willow weaving needs to continue to innovate and expand in the field of indoor and outdoor public spaces. As an important carrier of urban culture, public art plays an important role in promoting cultural heritage, public understanding and perception of traditional cultural spirit (Liu Weiqi, 2019).

In the creation of willow weaving public art, the focus should be on integrating and innovating the traditional weaving techniques of willow weaving with local culture, so that the traditional skills can present the cultural characteristics of the city and integrate fashion elements into it to cater to the pursuit and appreciation of fashion trends by young groups (Li, 2022). For example, in the process of creating willow weaving public art using Shanghai as an example, we fully considered the cultural attribute of Shanghai being called the "Magic City", which emphasizes the mystery and attractiveness of Shanghai as a modern city. As the country's economic, financial, trade and cultural center, Shanghai is one of the world's largest port cities, attracting young talents from China and even the world. At the same time, high housing prices and high consumption have also put many young people under tremendous pressure to survive.

The design work of "Magic City Magic Cube" takes the traditional willow weaving technique - back weaving in Table 3 as the basic element, extracts its unique trapezoidal weaving pattern, deforms it with modern techniques, and retains the basic pattern of the technique itself. At the same time, based on the traditional weaving utensils - baskets, innovative designs of monomer elements are carried out. As shown in Figure 3, the monomer elements can be designed into squares or hexagons according to the site requirements, and different monomer forms will create different artistic forms.

Shanghai is known as the "Magic City". By randomly stacking and combining individual elements, a variety of public art works can be generated, showing the fashion and retro style of Shanghai, the "Magic City", in the form of a Rubik's Cube. This design scheme caters to young users' pursuit of fashion and trend culture from a cultural sustainability perspective through the deep integration and innovation of Shanghai's regional culture and willow weaving craftsmanship culture, and gains identity recognition and emotional satisfaction by giving cultural recognition behind public art (Jiang & Ji, 2021).



**Figure 2** "Magic City Rubik's Cube" - wicker public art conceptual design work  
**Source:** Author

## **2. Adhere to the LCA life cycle to carry out willow public art design and creation**

We found in Table 2 above that as sustainable development has become more popular, modern young people pay more and more attention to environmental protection. They hope that willow weaving creation can adhere to the LCA full life cycle principle and consider the entire life cycle of "design plan - production - transportation and installation - dismantling, recycling and reuse" in all aspects (Yu & Wang, 2016; Sun, 2019). Taking the "Magic City Magic Cube" public art creation as an example, the design plan fully considers the design, materials, recycling and reuse, and minimizes the damage to the surrounding environment. First, in terms of material selection, metal skeletons and traditional Qi willow weaving patterns are used, and the natural degradation and recyclability of materials are fully considered. Secondly, local updates and redesigns according to site requirements, as well as the later maintenance and repair stages, are fully considered. Finally, the sustainable update

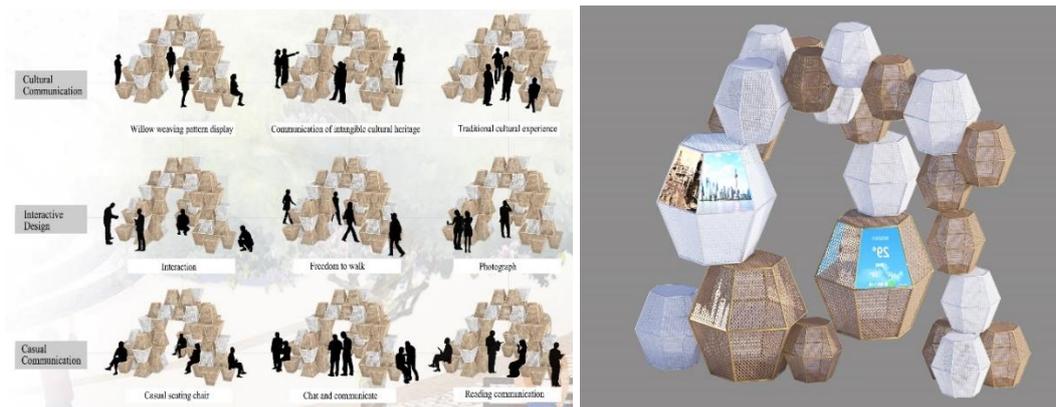
link of the entire work is considered. Each single element in the work is made in a modular way to facilitate later dismantling and updating. Because the single element is flexible and changeable, it can be partially or completely updated according to site requirements in the later stage, such as updating the weaving pattern or material, and the environmental sustainable development of public art can be achieved through local updates and material recycling systems.

### **3. Willow weaving public art creation should adhere to the integration and innovation of digital technology and traditional skills**

With the rapid development of information technologies such as the Internet, big data, and blockchain, it is necessary to integrate and innovate traditional skills with digital technology, and constantly bring forth new ideas in the intelligentization and digitization of willow weaving public art. In fact, the digital design and development of public art has become a new development trend, which is consistent with the previous research results (Sun, 2014). In the development and design of willow weaving public art, the new forms of intelligent and digital public art are gradually implanted into the urban indoor and outdoor space environment from point to surface, which has an important role in promoting the improvement of the quality of indoor and outdoor spaces. At the same time, intelligent voice, weather forecast, road query, local history and culture can be combined with the appearance of public art, which plays an important role in the digital dissemination and inheritance of willow weaving skills and local culture (Sun, N.; He, Y 2023).

In the design of "Magic City Magic Cube", full consideration is given to the integration and innovation of digital technology and traditional wicker weaving skills. On the basis of respecting traditional weaving skills, the design of this scheme caters to the strong demand of young people in Shanghai for new technologies and new communication, boldly integrates new technologies and new materials, and demonstrates the interaction and interaction between people and works of art in terms of intelligent interaction and digital experience. The communication is shown in Figure 3. Specifically reflected in: ① Fully considering the durability and publicity of public art works, using a deep integration of metal material frames and traditional weaving techniques to further enhance the sturdiness and durability of the works. ② The application of new technologies enables voice broadcasts, weather inquiries, cultural history and other information to interact and communicate with users through LED displays, enhancing users' digital emotional experience. At the same time, the traditional weaving techniques of this solution are also displayed in single elements in the form of QR codes. Users can scan the QR codes to watch the traditional weaving techniques, further enhancing the spread of traditional techniques among young users and cities. ③ With humanized functional attributes, this design scheme expresses the ever-changing city of Shanghai in a variety of artistic forms. At the same time, each plan fully considers and designs humanized functional attributes, where users can rest and chat, shuttle and play, take photos and check in, parent-child interaction, etc., which enhances the harmonious relationship between people and society through in-depth participation and interaction between users and the works.

This design scheme satisfies young users' strong sense of participation in public art through humanized functional attributes (Chang,2012). The innovative application of new technologies and new communication methods caters to the intelligent interaction between young users and public art, and enhances their digital emotional experience in the space (Sun , 2014) .



**Figure 3** “Magic City Cube” – Exhibition of willow weaving public art design works  
**Source:** Author

#### **4 Promote local economic development and rural revitalization through willow weaving public art creation.**

There is a crisis of fault lineage in the inheritance of willow weaving intangible cultural heritage. Most local young people are unwilling to engage in this traditional weaving work. The most important reason is that the income is low, the weaving techniques and products are monotonous and boring, and it is difficult to attract young people (Sun, Yang & Ren, 2019). In the creation process of willow weaving public art, the income and weaving techniques of local willow weaving artists should be fully considered. Actively build a linkage mechanism between enterprises and park landscapes in first-tier cities in Shanghai, and drive local economic development through willow weaving public art creation. In an in-depth interview with 15 Shanghai users, young people in Shanghai do not care about the economic value of public art, and are not sensitive to the modular design and production of public art, and the control of economic costs.

This is consistent with the influence of price on design works by young consumers. That is, young consumers prefer artworks with a sense of design and fashion, and price is not the most important consideration (Liu& Wan,2020). But from another level, it also reflects the different attitudes of young users and local willow weaving artists towards economic development. Willow weaving artists hope to increase their economic income and improve their living conditions with the help of willow weaving public art creation. The article believes that the design and creation of willow weaving public art should be jointly developed with relevant government departments, attach importance to the economic benefits it brings, and make positive contributions to local economic development.

In the design of the “Magic Cube”, a modular design and production method is adopted, which fully considers how to reduce production costs and promote the sustainable development of the local economy (Hapuwatte 2021). The single module is based on a metal frame. After being processed in the factory, the willow weaving artist hand-weaves on the

single metal frame. The willow weaving artist chooses different weaving techniques according to the size of the single element (as shown in Figure 4). It not only increases the economic income of local craftsmen, but also provides a new perspective for the innovative development of public art and intangible cultural heritage skills in Shanghai, a first-tier city.



**Figure4** “Magic City Magic Cube” – Willow Weaving Public Art Hand-woven Picture  
**Source:** Author

## Conclusions

Based on the theory of sustainable design, this article focuses on the analysis and discussion of the sustainable design creation of traditional willow weaving skills in public art from the perspective of young users, focusing on the four sustainable dimensions of culture, environment, society, and economy. On this basis, the conceptual design work of willow weaving public art -"Magic City Rubik's Cube" was completed, focusing on analyzing the specific display of traditional willow weaving skills in public art. The final conclusion shows: ① With the rapid development of China's economy and the further improvement of cultural confidence, young users in Shanghai pay more attention to the integration and innovation of cultural sustainable innovation in willow weaving public art works, which is in line with the current development trend of China's "national trend culture" (Sang, Guo, & Sun 2021) ② As the scientific outlook on development and the concept of sustainable development become more and more popular, young users have a more positive attitude towards environmental protection (Zhang, An & Liu, 2016). This group generally believes that willow weaving public art works should pay more attention to the harmony between people and the environment, and focus on the implementation and management of the entire life cycle of LCA. ③ Young users aged 18-38 are the biggest beneficiaries of the development of the Internet economy and have a strong support for digital emotional experience (Liu & She, 2021). This group is even more looking forward to the widespread application of new technologies, new materials, and new communication methods in willow weaving public art works, and hopes that new works can bring users in-depth participation and emotional experience of intelligent interaction; ④ The generation who grew up in the reform and opening up also The generation with China's rapid economic development does not pay special attention to the economic benefits of willow public art works, but pays more attention to the cultural quality, environmental factors and positive impact on society in the works (Li , 2022).

The results of this study provide an important reference for promoting the design practice of intangible cultural heritage skills in public art, and play a positive role in promoting the dissemination and inheritance of intangible cultural heritage skills in first-tier cities. However, this sample collection is limited to young users in Fengxian District, Shanghai and the user's education, age, income, etc. will all have a certain impact on the survey results. In addition, this study is limited to the conceptual design stage and lacks empirical research on user satisfaction after the design works are implemented.

## **Suggestion**

### **1. Adhere to the principle of sustainable development of culture, environment, economy and society**

In the process of willow weaving public art design and creation, we should adhere to the sustainable design strategy, pay close attention to the integration and innovation of willow weaving culture and local culture, pay attention to the sustainable development of the surrounding environment, take into account economic interests, and promote the harmonious development of society.

### **2. Adhere to the principle of digital innovation**

With the rapid development of science and technology, more and more young people are highly welcoming of intangible cultural heritage skills, and expect willow products to have better development in digital design and new media technology applications. Therefore, integrating digital technologies such as smart voice and smart lighting with willow products will become a future development trend.

### **3. Adhere to the principle of modularization and LCA life cycle**

In the development and design of willow public art, the principle of LCA life cycle should always be adhered to, and the whole chain of design and development, processing and production, weaving presentation, transportation and installation, dismantling and reuse should be designed holistically, and the principle of modular design should be adhered to save costs and reduce damage to the surrounding environment.

### **4 Suggestions for further research**

In the future, relevant empirical research will be conducted on the implementation of willow weaving public art works, and satisfaction evaluation will be conducted on the user group and experts in related fields to obtain more scientific and effective research results. In short, in the future, the design plan will be further optimized, and the boundaries of the integration and innovation of intangible cultural heritage skills and public art will be continuously expanded to promote the protection and inheritance of willow weaving skills and the sustainable development of the human living environment.

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