

Research on the Design of Cultural and Creative Products based on China's Woven Timber Arch Corridor Bridges

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Abstract

In recent years, cultural and creative product industries based on regional culture have been flourishing. China's woven timber arch corridor bridges are of great value to be developed for their unique construction skills and abundant cultural connotation. According to the summary of previous studies, there are three main methods of developing cultural and creative products based on cultural elements: representational fusion, framework is fusion and implication fusion. Based on the above three methods, this paper discusses how to integrate the cultural elements of the corridor bridge into cultural creative products through case studies.

Keywords

Cultural and Creative Products; Products Design; Corridor Bridges.

1. Introduction

Chinese woven timber-arch corridor bridges, renowned for their elegant and intricate structures, often with a traditional Chinese roof, are mainly found in the mountainous regions of northeastern Fujian and southern Zhejiang [1]. The delicate structure featuring arch rings of interlaced timber beams is what sets Chinese corridor bridges apart from other bridges [2]. By combining the traditional techniques of beam-weaving with mortise-and-tenon connections, the corridor bridges are assembled using several multiple-segment arch members composed of short timber beams [3]. In 2009, this unique construction method was inscribed on the UNESCO list of 'Intangible Cultural Heritage in Need of Urgent Safeguarding'. There is a great urgency to inherit and preserve the cultural heritage of corridor bridges.

Chinese corridor bridges not only perform basic transportation functions, but are also the site of many folkloric activities, such as rituals, social interactions and trade [4]. Corridor bridges are an important part of regional culture. It is therefore meaningful to design cultural and creative products based on the unique construction methods and rich cultural connotations of Chinese corridor bridges.

Many Chinese scholars have conducted research on woven timber arch corridor bridges, but there is little research on the design of cultural and creative products based on corridor bridges. The current design research cases are mainly about the application of corridor bridge elements to the design of buildings, bridges [4] and furniture [3]. This paper provides methods and ideas for the design of products based on the culture of corridor bridges through literature survey and case studies.

2. Literature Review

2.1. Definition and Characteristics of Cultural and Creative Products

According to the international definition of the cultural and creative industries, they include at least the following six categories: ①cultural and natural heritage, including antiques; ②performance and celebration, including musical instruments, recording media; ③ visual

arts and crafts, including paintings, other visual arts, crafts, jewellery, photography; ④ books and newspapers, including books, newspapers, other printed materials; ⑤ audio-visual and interactive media, including film and video; ⑥ design and creative services, including architecture and design [5]. In contrast, cultural and creative products in a narrow sense mainly refer to all kinds of goods that are given certain cultural connotations by means of design, with practical functions as the basic condition [6]. In this paper, we focus on cultural and creative products in the narrow sense, which are "products that originate from cultural themes, are transformed through creativity, and have market value" [7]. Culture and creativity are the essential differences between cultural and creative products and ordinary commodities. In recent years, the design of cultural and creative products is becoming more differentiated, interactive, technological and digital [8]. How to creatively integrate culture into products and design creative products that meet the needs of the times is a proposition that designers are constantly exploring.

2.2. Design Methods for Cultural and Creative Products

Many scholars have researched how to develop cultural creative products based on specific cultures and put forward feasible methods. It is generally agreed that the basic path to design products based on specific cultures is to extract representative cultural elements, such as patterns, colours, shapes and material cultural connotations, and incorporate them into the products [9]. There are three main ways of incorporating cultural elements into cultural and creative products: representational fusion, framed fusion and implication fusion [10].

Representational fusion, refers to the incorporation of cultural elements into product design in a symbolic or totemic manner. The designer selects and extracts the representative visual elements of the regional culture for reproduction or artistic processing, and applies these visual elements to the product. Cultural and creative products designed in this way retain the characteristics of the original motifs and are highly recognisable.

Framed fusion, instead of simply applying patterns to products, is based on recognising and understanding the representative features and cultural connotations of things, using cultural elements to dovetail with modern products in terms of function and usage, and combining the use function of the products themselves to give cultural elements practical meaning.

Table 1. Cultural integration methods and design aspirations

Development Approach	Design Directions	User Experience
Representational fusion	Surface decoration, colour, texture, shape, etc.	Users get an intuitive feeling through the appearance of cultural and creative products
Framed fusion	Function, operation, etc.	Users feel the culture contained in the product by understanding how the product is used or structured
Implication Fusion	Cultural connotations, storytelling, emotionality, etc.	After understanding the spiritual connotation of cultural elements, users can read the connotation of the product. There is a spiritual belief and ideological interaction between users and cultural and creative products.

The superficial design of patterns and the functional design of product forms are not enough to reflect the inner core of the cultural elements; designers need to design products with narrative, abstraction and emotion from the deeper spiritual connotation of the cultural elements. This integration is not a simple application of the 'shape' of the cultural element, but rather a spiritual and emotional integration of the essence of the cultural element into the product. The

products designed in this way may not have a tangible cultural element on them, but when you look at them, you can feel the cultural flavor. This is because the core of the product comes from the connotation of the cultural elements, from the spiritual aspect of the cultural elements. This is the implication fusion of cultural elements and the product.

The ways of incorporating cultural elements and design aspirations are shown in Table 1. Different methods of incorporating cultural elements correspond to different cultural product design aspirations and design outcomes, and bring different experiences and feelings to the user.

3. Case Study

In the following, I will analyse the above three approaches to cultural and creative product development in relation to existing examples of Corridor Bridge-themed cultural and creative products, and explore the path of developing cultural and creative products based on Corridor Bridge culture.

3.1. Representational Fusion

There are two main approaches to representational fusion. One is to print patterns directly on the surface of the product, such as on small everyday objects like bookmarks, handbags, postcards and mobile phone cases. As shown in Figure 1, the corridor bridges are designed as illustrations applied to mobile phone cases. This method of product development is low cost, easy to imitate and easy to disseminate.



Figure 1. Phone cases with corridor bridges patterns

The other is to artistically reproduce the extracted representative regional cultural elements through artistic techniques and apply them to products that match the shape. Compared to the first method, this method is more original and artistic. As shown in Figure 2, the designer uses the visual language of paper carving to present the stunning scenery of the corridor bridge and incorporates its patterns into the design of the night light. Rather than simply printing on the product, the corridor elements in the night light are presented in a more artistic way.



Figure 2. Lanxi bridge paper carving night light

The Corridor bridge octavo box in Figure 3 is another example. The designer has simplified and extracted the shape of the corridor bridge and designed it as a small landscape on the octavo box. When the music of the octavo box plays, the view of the bridge on the box rotates with the music. In this case, the bridge no longer appears as a flat pattern, but is an important part of the product shape.

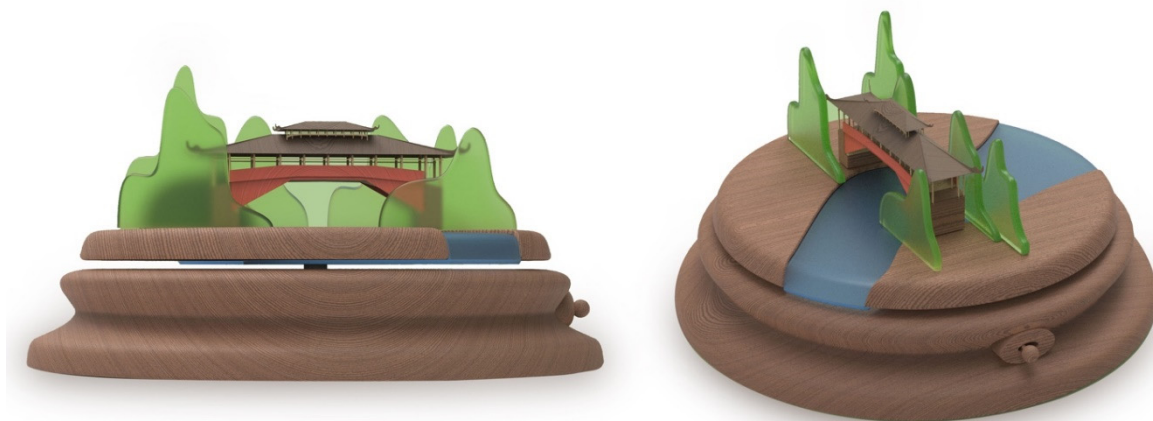


Figure 3. Corridor bridge octavo box

In all of the above examples, cultural elements are incorporated into the appearance of the product, and the user gets an intuitive sense of the product through its external appearance. This approach provides a direct cultural experience for the user, but it is often superficial. However, it is a widely used design method that allows for the quick development of a series of products with visual unity and recognition, thus creating a recognisable brand.

3.2. Framed Fusion

Rather than simply attaching cultural elements to the product, the framed fusion design approach combines the cultural elements with the use of the product itself so that the user experiences the cultural elements in their use.

In Figure 4 the designer has applied the structure of a woven timber arch bridge to the bench and has chosen wood as the body of the bench. This gives the bench a solid structure and the characteristic aesthetics of a corridor bridge. When the consumer uses the bench, he or she can feel the balance, stability, strength and formality of the gallery bridge. The mechanics and aesthetic values of the corridor bridge are presented in this piece.



Figure 4. A bench inspired by the woven timber arch bridge design

The woven wood arch bridge block in Figure 5 is another typical example of frame fusion. In contrast to the bench case, the designer has deconstructed and restructured the structure of the woven timber arch bridge in greater depth. The blocks in this work can be broadly divided into two types, those built-in mortise and tenon construction, and those built through the interaction of structure and force. The colour of the blocks is a reference to the colour palette of ancient Chinese architecture, giving them a distinctive flavor. In this example, the designer has analysed and modified the structure of the arcade bridge in more depth and then incorporated it into the product, giving the blocks a deeper cultural meaning and allowing children to naturally learn about traditional Chinese culture while playing with them. Compared to previous examples, the arch bridge blocks are more interesting and interactive, giving users a more subtle and profound cultural experience. The framed fusion design approach, where the product is designed from the user's usage behaviours and the culture of the arcade bridge is integrated into the specific functions of the product, gives the user a deeper interactive experience compared to the superficial fusion design approach.



Figure 5. Woven timber arch bridge building blocks

In order to meet market demand, form a brand identity, and respond to the trend of differentiation, interaction and technology in cultural and creative products, the team has tried to design cultural and creative products using both representational and framed fusion methods.

The 3D printing pen gift box in Figure 6 is a high-end cultural and creative product designed based on the regional culture of Taishun, represented by the corridor bridge. It contains a 3D printed pen, a cleverly designed box, model papers and material packs based on the regional culture. The designers combed through the intangible cultural heritage items in the Taishun region and designed intangible cultural heritage items such as the corridor bridge, puppet show and the Dingbu dragon into model papers. Using the 3D printing pen to draw the mould papers, consumers can get three-dimensional scenes of the intangible cultural heritage and experience the charm of Taishun culture.

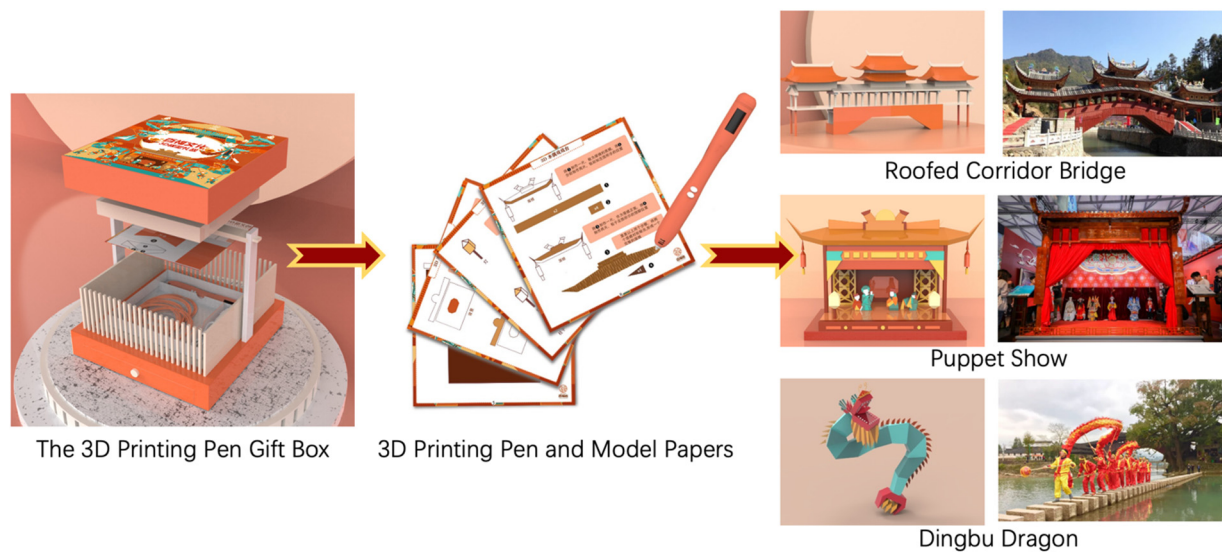


Figure 6. 3D printing pen gift box

The packaging of the gift box is ingeniously designed as a set of corridor bridge blocks. The wooden sticks in the packaging can be removed and built into the body of a corridor bridge, as shown in Figure 7, which is similar to the arch bridge blocks in the previous article. The difference is that the user can use the 3D printing pen to create the roofs of the bridge and get a complete view of the Taishun bridge. Compared to the corridor bridge blocks mentioned before, this work is more visual, tangible and recognisable.

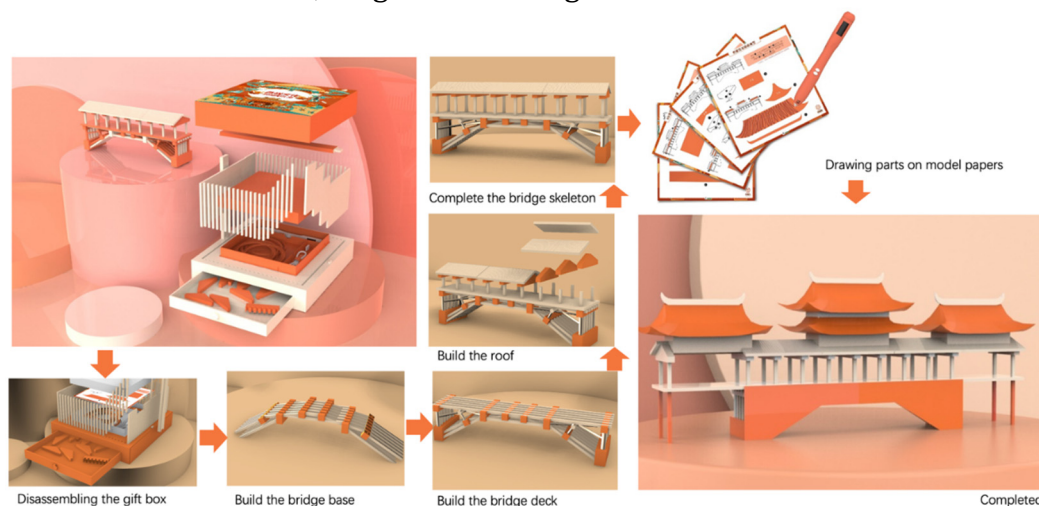


Figure 7. The gift box is ingeniously designed as a set of corridor bridge blocks

In addition, the designer has designed an intangible and cultural heritage booklet to introduce the local intangible and cultural heritage projects of Taishun in detail (Figure 8). The whole work not only shows the structure and form of the bridge, but also the local culture of Taishun County, where the bridge is located. The bridge is not an isolated entity, but is complementary and interconnected with other cultures in the region. This design provides a panoramic view of the culture of the region and brings the user an immersive and interactive cultural experience. In this case, the designers used the representational fusion approach to apply the main packaging visuals to the packaging of cultural and creative peripherals and local specialties in Taishun, creating a series of products and forming a unified brand identity. The framed fusion approach was also used to design the corridor bridge block packaging and the 3D model papers, making the products highly interactive and interesting.



Figure 8. The intangible and cultural heritage booklet of Taishun

3.3. Implication Fusion



Figure 9. Hangzhou stool

Implication fusion refers to the incorporation of the spiritual connotations of cultural elements into a product in a spiritual and emotional way. For the consumer, after understanding the spiritual connotations of the cultural elements, it is possible to read the meaning of the product. This design allows for a spiritual, ideological interaction between the user and the cultural product [11]. For example, this Hangzhou stool made of bamboo (Figure 9) is inspired by the

West Lake in Hangzhou, with layers of curved bamboo pieces visually resembling the shape of an arch bridge and ripples. When the user sits on top of the stool, he or she can feel the deformation of the sheet in the centre of the stool under pressure. This feeling is poetically reminiscent of the soft waters of the West Lake and the arched bridges over the lake. There are currently no similarly corridor bridge themed products, and it is more difficult to design them using an implicit fusion approach. This may be due to the fact that the most important feature of the corridor bridge is its delicate structure and beautiful shape, which is more difficult to distil into abstract meaning. Therefore, it is a proposition that needs to be studied in order to continue to explore the spiritual connotations of the bridge culture and integrate it into the creative products.

4. Conclusions and Recommendations

There are three ways to develop cultural and creative products based on cultural elements: representational fusion, framed fusion and connotational fusion. Based on the case studies in the previous section, we found that:

In terms of element extraction and application, the representational approach focuses on extracting and applying the appearance of the bridge, the framework approach focuses on extracting and applying the structure and construction techniques of the bridge, and the implication approach requires designers to extract more abstract cultural elements to present the aesthetic and cultural heritage of the bridge.

In terms of product development and user experience, the representational approach to product development is highly efficient and low cost, and can be widely applied to the design of corridor bridge-themed creative products, suitable for establishing brand identity and developing a series of products. The framed approach allows for the design of interactive and creative cultural and creative products that allow the user to feel the cultural connotations of the product. The subtle structure of the corridor bridge is well suited to be integrated into the structure, function and mode of operation of the product. The design of connotations can create a deep and spiritual exchange between the user and the product, but there is still a lack of practice in the use of connotations in the design of cultural and creative products for corridors, which can be explored in conjunction with the regional culture of the bridge.

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