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### **SOCIAL INTERVENTION AND CULTURAL STRATEGY INTEGRATION OF CULTURAL HERITAGE ELEMENTS IN GLASS PRODUCT INNOVATION**

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## **Social Intervention and Cultural Strategy Integration of Cultural Heritage Elements in Glass Product Innovation**

Qingfeng LIU<sup>1</sup>, Nurul ‘Ayn Binti AHMAD SAYUTI<sup>2</sup>, Jiamin HU<sup>3</sup>

### **Abstract**

With the vigorous development of the cultural and creative industry, glass products, as an important carrier, have received increasing attention in their innovative design. This study aims to explore the social intervention and cultural strategy integration of cultural heritage elements in glass product innovation. Through the analysis of the Hazel Clark cultural space model, it seeks to find a path to effectively integrate cultural heritage elements into glass product design. This study adopts comparative analysis and case study methods to deeply analyze the inherent relationship between cultural spatial patterns and product attributes, and verify their feasibility in practical applications. The results indicate that cultural heritage spatial analysis and application have significant social intervention effects in glass product innovation, which can enrich the cultural connotation of products and enhance their market competitiveness. Meanwhile, this study also reveals the transformation patterns and value enhancement strategies of cultural heritage elements in glass product innovation.

*Keywords:* glass products; cultural heritage; spatial analysis; social intervention; cultural strategy; behavioral patterns.

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## Introduction

According to the latest UNESCO document “International Flow of Cultural Products and Services from 1994 to 2003”, cultural products, as an important achievement of cultural industry activities, have a core value in their unique cultural elements and connotations. Cultural products, especially when they incorporate rich cultural heritage elements, can not only meet the growing personalized needs of consumers, but also effectively inherit and promote local cultural characteristics (Zhao, 2020). Cultural heritage, as a carrier of cultural elements, has complex and multidimensional characteristics. Firstly, the aesthetic characteristics of cultural heritage are its most intuitive expression, including visual elements such as lines, shapes, and decorations. These elements provide designers with rich innovative inspiration. Secondly, the significance characteristics of cultural heritage are the embodiment of its connotation and symbolic significance, such as the progress symbolized by totems and the prayers expressed in rituals (Hsiao *et al.*, 2018). These meaningful features endow cultural products with deep cultural value. Finally, Hazel Clark’s cultural space model further proposes the behavioral characteristics of cultural heritage, namely the behavioral patterns of people in specific cultural backgrounds (Leong & Clark, 2003). These behavioral characteristics not only enrich the connotation of cultural heritage, but also provide new perspectives for the innovative design of cultural products.

By integrating cultural heritage elements into the innovative design of glass products, we can not only meet the increasingly personalized needs of consumers, but also achieve the integration of social intervention and cultural strategies. On the one hand, these glass products with rich cultural connotations can enhance the visibility and influence of local culture, promote cultural exchange and dissemination; On the other hand, these products can also become an important force in promoting the development of local cultural industries, injecting new vitality into the local economy. Therefore, integrating cultural heritage elements into innovative design of glass products is not only a challenging design task, but also a profound social and cultural practice. In future research, we will continue to explore more possibilities of cultural heritage elements in glass product innovation, contributing more wisdom and strength to cultural inheritance and innovative design.

The flow chart of cultural heritage spatial analysis and application in glass products can be seen in Figure 1.

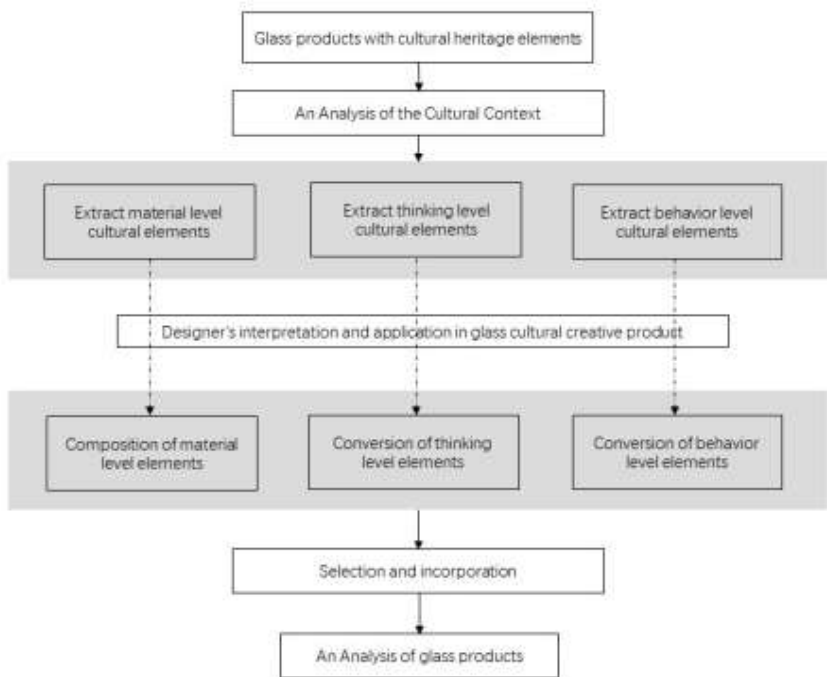


Figure 1: Cultural heritage spatial analysis and application flow chart for glass products design

### Theoretical Basis

#### *The Protection and Reuse of Cultural Heritage and Innovation of Glass Products*

With the increasing awareness of global cultural heritage protection, how to better protect and reuse cultural heritage to promote cultural innovation and sustainable economic development has become a hot research topic. Cultural heritage, whether material or intangible, carries rich historical, cultural, and symbolic values. They are not only symbols of national identity, but also important resources for promoting cultural diversity and innovation. In the field of glass product innovation, the integration of cultural heritage elements not only provides new sources of inspiration for design, but also provides new avenues for the protection and inheritance of cultural heritage. By combining cultural heritage elements with innovative glass products, we can achieve two important goals: firstly, through glass products as a modern medium, we can disseminate and popularize cultural heritage knowledge to the public, improve public awareness and protection awareness of cultural heritage; Secondly, utilizing cultural heritage

elements to provide unique design elements and concepts for glass product innovation, enhancing the cultural connotation and market competitiveness of the product.

In order to better achieve this goal, we need to conduct in-depth research and classification of cultural heritage. According to the definition of UNESCO and relevant research by scholars, cultural heritage can be roughly divided into two categories: tangible cultural heritage and intangible cultural heritage. In terms of tangible cultural heritage, we can further subdivide it into classical garden relics, urban architectural relics, cultural landscapes, tomb relics, ancient tombs, etc; In terms of intangible cultural heritage, it includes legends, performances, traditional festivals, historical relics, traditional techniques, etc. These classifications provide us with a theoretical basis for utilizing cultural heritage elements in glass product innovation.(Paschalidou *et al.*, 2022; Vecco, 2010) (Hani *et al.*, 2012). The proposed classification of cultural heritage applicable to the characteristics of cultural and creative products can be seen in Figure 2.

Proposed classification of cultural heritage applicable to the characteristics of cultural and creative products											
Tangible cultural heritage						Intangible cultural heritage					
Name	Example	Icon	Name	Example	Icon	Name	Example	Icon	Name	Example	Icon
Relic of classical garden		01	Mausoleum Heritage		04	Legends		11	Historical relics		14
Urban architectural remnant		02	Ancient town		05	Performances		12	Traditional skills		15
Cultural landscapes		03				Traditional festivals		13			
		06			09			16			19
		07			10			17			20
		08						18			

Figure 2: Proposed classification of cultural heritage applicable to the characteristics of cultural and creative products

On the other hand, some scholars have put forward a more pessimistic view. Because the value of cultural heritage assets is far more complex than that of most goods and services, it is believed that the use of cultural heritage for consumption, if not managed properly and carefully, can commercialize, dilute, and standardize the significance of cultural heritage (Ho & McKercher, 2004). This reminds the researcher that the integration of cultural heritage in glass product design must take into account the conservation and sustainability of cultural heritage reuse. Cultural heritage can be managed and protected in a variety of ways. One common approach is to protect cultural heritage through creative industries. The cultural and creative industry is one of the types of creative industry. The creative industry is becoming an essential part of the modern post-industrial knowledge economy. Not only are they considered capable of delivering above-average economic growth and job creation, but they are also carriers of cultural identity and play an essential role in promoting cultural diversity (Hani *et al.*, 2012). The combination of cultural heritage and products is an essential way of its utilization and cultural transmission, and it can seek ways to realize the sustainable development of cultural

heritage to maintain cultural diversity and meet the growing cultural needs of the public (Dang *et al.*, 2021). In other words, combining glass products and cultural heritage elements can not only innovate product design, meet people's individual needs, promote economic development, and enable sustainable development and utilization of cultural heritage.

### *Cultural Heritage Spatial Analysis*

As mentioned above, effectively understanding and interpreting cultural heritage elements is the key to correctly reusing cultural heritage. Due to the complexity and diversity of cultural heritage, many scholars have explained it from different angles. Some analyze the aesthetic characteristics of cultural heritage elements from the perspective of art, some interpret the social role of cultural heritage from the perspective of social psychology, and some focus on the economic value that cultural heritage may bring from the perspective of economics. Among them, scholars Leong & Clark's three-dimensional cultural, spatial model is more suitable for this study to analyze cultural heritage elements (Leong & Clark, 2003). This is because the three dimensions of its analytical model coincide with the three characteristics of cultural and creative product design, which were explained later in this paper. This relationship helps find a new way to innovate glass product design. Thus, in this study, it is proposed to analyze the elements of traditional cultural heritage according to the following three levels: the material level, all physical attributes of cultural heritage, such as sculpt, color, material, and pattern; the behavioral layer, including the activities, rituals, and customs of people in the cultural heritage; the thinking level, such as people's psychological and emotional demand. The proposed analytical spatial model of cultural heritage elements can be seen in Figure 3.

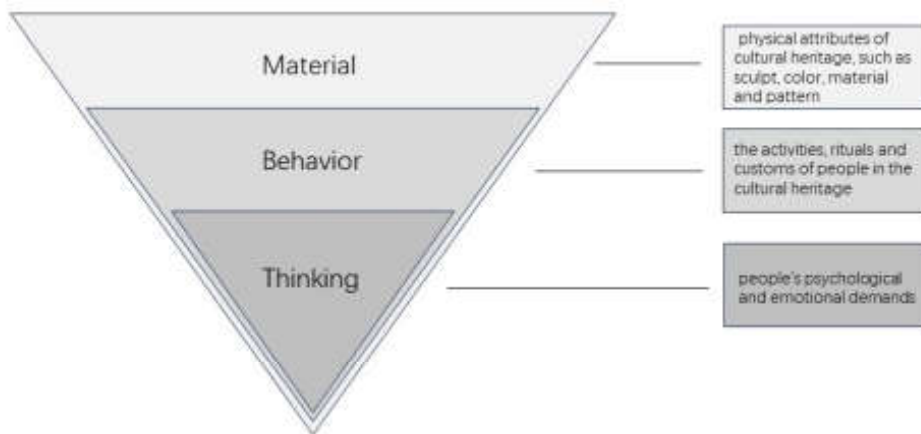


Figure 3: Proposed analytical spatial model of cultural heritage (adapted from Hazel Clark's cultural spatial model)

According to the interpretation of the cultural heritage space model and previous literature review, the three analysis levels of cultural heritage elements have their respective focuses: at the material level, the elements directly relate to our vision; at the behavior level, they reflect the people’s behavior habits, which may be corresponded to the functional characteristics of the product, and at the meaning level, they can be understood as the spiritual demands of users in this cultural heritage. Take the Dragon Boat Festival, a traditional Chinese festival, for example. According to UNESCO, it was listed in the Intangible Cultural Heritage of Humanity in September 2009. Cultural elements can be extracted from sculpt, color, material, and pattern regarding material-level elements from the iconic “Zong Zi” image. The characteristic of the sculpture is its triangular pyramid shape; the color is green and yellow, the material is glutinous rice and leaves, and the pattern is reed leaf texture. Regarding the behavior level, people eat zongzi, a traditional habit during the Dragon Boat Festival. In the process of forming this habit, people have been given good wishes for academic progress, and it has been transformed into writing articles. People’s good wishes have been reflected through this behavior and decoration in the material layer. The analysis of these three dimensions is expected to provide a comprehensive understanding of the custom of eating zongzi at the Dragon Boat Festival, which will significantly help in choosing which layer of cultural heritage elements to apply to the design of glass products. The cultural elements of the Dragon Boat Festival at three levels are analyzed according to the proposed cultural heritage spatial analysis model. The analysis results are shown in Figure 4.

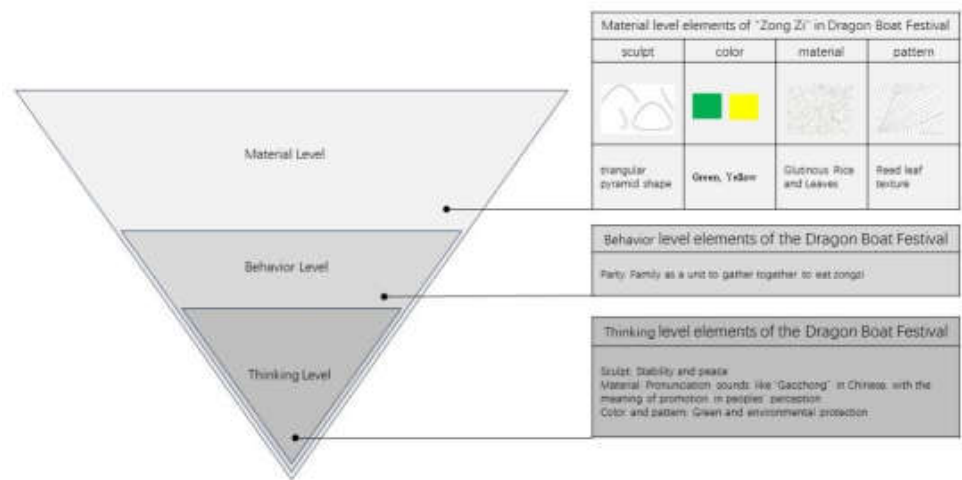


Figure 4: The cultural elements are analyzed according to the proposed cultural heritage spatial analysis model.

### *Attributes of Glass Products With Cultural Heritage Elements*

Cultural heritage elements carry rich historical, cultural, and social information. In the design of glass products, by incorporating these elements, we can give the product a deeper meaning. This semantic attribute is not only reflected in the symbolic meaning of the product, but also in its inheritance and expression of society, culture, and history. Through social intervention, we can guide the public to pay more attention to cultural heritage, enhance cultural confidence, and promote the inheritance and development of culture. The practical attributes of glass cultural creative products are reflected in their actual use value and functionality (Hancock *et al.*, 2005). In the design and production process, we should not only focus on the beauty and uniqueness of the product, but also on its practicality and ease of use. By incorporating cultural heritage elements, we can make our products closer to people's daily lives, enhance their practicality and affinity. Meanwhile, social intervention can also help us understand the needs and preferences of the public, in order to design products that better meet market demands. The aesthetic attributes of glass cultural creative products reflect their artistic and aesthetic value. By utilizing cultural heritage elements, we can create glass products with unique beauty and artistic value (Kamp & Desmet, 2014). These products not only meet people's aesthetic needs, but also stimulate their imagination and creativity. In the process of social intervention, we can use exhibitions, lectures, workshops and other forms to deepen the public's understanding of the aesthetic value of glass cultural creative products, and improve their aesthetic taste and ability.

In the field of glass cultural creative products, the third attribute of the product is more important. This is because symbolism is consciously used in the design and production of glass products, and symbolic associations are used to construct differentiated lifestyle patterns using products. Therefore, this study proposes that product attributes be distinguished from these three levels to apply cultural heritage elements reasonably. They are meaning attributes, practical attributes, and aesthetic attributes.

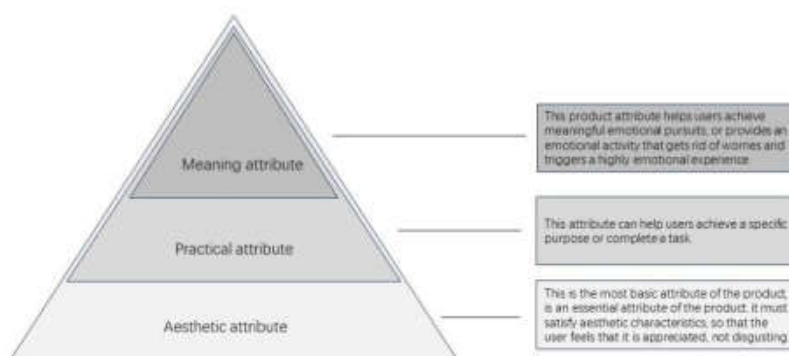


Figure 5: The proposed hierarchical classification of cultural and creative product attributes. (Adapted from Kamp & Desmet's analysis of product attributes)



The aesthetic attribute is the glass product's most fundamental and essential attribute. The glass products may not have practical functions and reflective spiritual feedback, but they must satisfy aesthetic characteristics, so that the user feels that it is appreciated, not disgusting. The practical attribute is the second level attribute of the product, which may not even exist in some glass products with cultural elements. This attribute can help users achieve a specific purpose or complete a task. The meaning attribute is the third and highest attribute of the product, which helps the user achieve emotional pursuit, or provides an emotional activity that frees from worry and leads to a highly emotional experience.

### *Analysis of Cultural Gene Transformation and Integration from the Perspective of Social Intervention*

When exploring the application of cultural heritage elements in glass product innovation, we can draw on the concept of genes in biology to understand the hierarchical structure of cultural space and how these elements combine with different attributes of products. The process of cultural gene transformation, guided by social intervention, can more effectively achieve the integration of cultural strategies. Firstly, we consider material level shapes, colors, and patterns as preliminary representations of cultural inheritance. These material cultural genes, driven by social intervention, can be transformed and integrated through modern design techniques. For example, in the design of glass products, we can preserve the physical layer genes of traditional cultural elements, such as shape and color, while using modern composition techniques and pattern design to achieve a modern interpretation of traditional culture. Secondly, in terms of significance, the intangible cultural genes carried by cultural heritage elements, such as festival culture and academic pursuits, also need to be transformed and transmitted through social intervention. Social intervention can enhance public awareness and respect for cultural heritage through various forms of cultural activities, educational projects, and promotional methods, thereby promoting the effective application of these intangible cultural genes in glass product innovation.

Taking the Loong Boat Festival as an example, its cultural genes are not only reflected in the shape and color of Zongzi, but also contain people's spiritual pursuit of academic progress. Under the guidance of social intervention, we can embody these intangible cultural genes in glass products through decorative graphic symbols. For example, in the design of glass products, we can use elements of the Loong Boat Festival, such as Loong Boat, Zongzi, etc., to carry out creative transformation through modern design techniques, while integrating the theme of academic progress, so that the products have both traditional cultural charm and modern design innovation. In addition, social intervention can also promote the cross-border integration of cultural heritage elements in glass product innovation. Through cooperation and communication with other fields, we can introduce cultural heritage elements from different fields into the design of glass products,

achieving diversified integration of cultural elements. This cross-border integration not only enriches the cultural connotation of glass products, but also injects new vitality into the inheritance and development of traditional culture. The cultural gene of the Dragon Boat Festival and its transformation process can be seen in Figure 6.

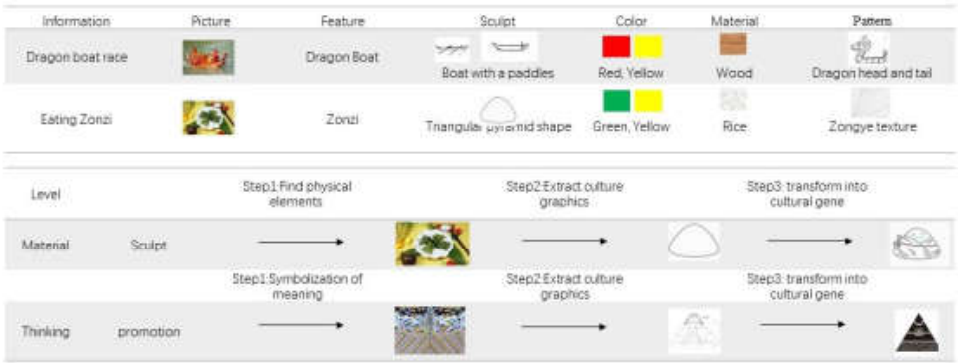


Figure 6: The cultural gene of the Dragon Boat Festival and its transformation process

When exploring the application of cultural heritage elements in glass product innovation, we need to recognize that cultural gene transformation is not always universally present in all cultural heritage spaces. Especially in certain specific categories of products, such as home furniture, functional value may not be the primary consideration factor, and the significance of cultural value will become particularly prominent. Taking Wang Sanmao’s Chinese opera character glass decoration painting as an example, the designer cleverly integrates traditional opera elements into the glass decoration painting, creating a pure cultural experience. Although the designer clearly stated that this glass product does not have practical value, it provides users with an opportunity to experience the beauty of Beijing Opera culture anytime and anywhere by showcasing the elements of the traditional character “Huadan” in Beijing Opera. This innovative approach stimulates public interest in traditional culture and promotes cultural inheritance and popularization through social intervention. The product case is shown in Figures 7 (a) - (b).

In addition, the extraction, transformation, and reproduction of cultural genes in cultural heritage can also be carried out at different levels. Taking Oracle Weather Storm Bottom Night Light, a derivative product of the National Library of China, as an example, this product not only incorporates the “Four Directions Wind” element of the oracle bone inscriptions in its appearance, but also echoes the tradition of ancient Chinese people using oracle bones to predict weather in terms of functionality. This innovative design approach allows users to feel the emotions, identity, and cultural significance carried by the product from multiple perspectives during the use of the product. Social intervention plays a crucial role

in this process. Another example in Figures 7 (c) - (e) is that the derivative product of the National Library of China, Oracle Weather Storm Bottom Night Light, can prove this. By organizing cultural activities, exhibitions, educational projects, etc., we can enhance public awareness and respect for cultural heritage, thereby guiding designers and manufacturers to pay more attention to the application of cultural heritage elements in product innovation. Meanwhile, social intervention can also help designers and manufacturers better understand market demand and consumer preferences, thereby designing glass products that better meet public expectations.



Figure 7: Chinese traditional opera characters decorative painting (a) “Huadan” role in Peking Opera (b) Oracle Weather Storm Bottle Night Light (c) “Sifangfeng” Oracle (d) Oracle (e)

Specifically, this product’s inspiration comes from the “Sifangfeng” collected by the National Library of China. For the meaning and positioning of the product, the Cultural and Creative Products Store of the National Library of China has given a good explanation, which is mainly reflected in four aspects: touching and tracing the origin of Chinese calligraphy; Appreciating the beauty of oracle bones; Understanding of the ancestors of Shang and Zhou philosophy; Inheriting and remembering the immortal history of China. The conversion process of cultural genes behind the Oracle Weather Storm Bottle Night Light can be seen in Figure 8 below. To sum up, this product draws on cultural heritage at two levels: at the physical level, it not only borrows the appearance of “Si Fang Feng” but also borrows the oracle bone decoration, which is also the main appearance feature of the glass product at the aesthetic level; at the behavioral level, the ancient behavior of weather divination is retained and transformed, and modern material technology is used to realize the weather prediction function of the product.

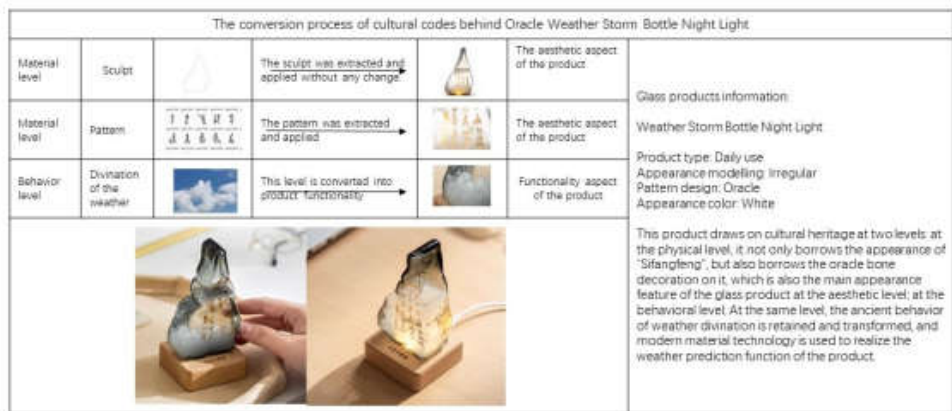


Figure 8: The conversion process of cultural genes behind Oracle Weather Storm Bottle Night Light

Methodology

Firstly, a model of applying cultural heritage elements to glass product design is proposed through the spatial analysis of cultural heritage elements and the analysis of the main characteristics of product design. In this model, through the analysis and deformation of three different levels of cultural heritage elements, these elements are integrated into different glass product attributes to achieve the purpose of integrating cultural heritage and glass products. Then, through the analysis of a successful case, the feasibility of this model is further verified. During this process, according to the proposed cultural space analysis model, the cultural gene of cultural heritage is analyzed, and through the analysis of the main attributes of product design, the model of applying cultural heritage elements to glass product design is verified. This case study used reverse thinking. Glass product cases with good feedback in the Chinese market will be analyzed and understood according to the cultural heritage spatial analysis model. This is because how to analyze and interpret the cultural elements of cultural heritage plays a vital role in whether the designers can successfully innovate glass products incorporating cultural heritage elements. Finally, according to the analysis flow chart of glass product design and cultural heritage mentioned above, the application of cultural elements in 27 glass products is analyzed using the case study method. The sampling criteria are that these glass products have the material, behavioral, or meaning-level elements of cultural heritage and have good market feedback. The designer's interpretation and application of glass products will also be discussed.

The case study is mainly analyzed through the following four steps: First, find the source and background of cultural elements; excavate the types and humanistic

background of apparent cultural heritage contained in the glass product design with cultural heritage elements. Secondly, the tangible manifestations of the intangible cultural heritage or the components of tangible cultural heritage are found. Thirdly, the material level of cultural heritage is decomposed and refined, and the abstract culture is intelligible, understandable, participative, and researchable, mainly from the visual aspects of sculpt, color, material, and pattern. Finally, the material and thinking level elements should be composited to cultural codes. The case decomposition steps of cultural heritage elements can be seen in Figure 9.

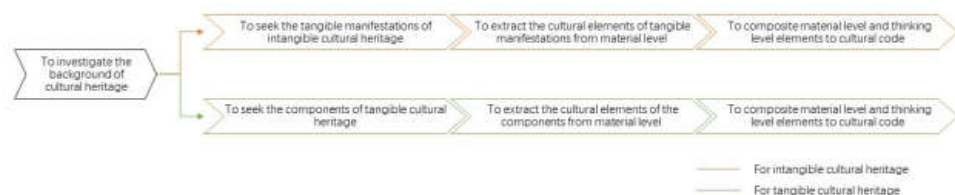


Figure 9: Proposed case decomposition steps of cultural heritage elements

### *The Application Model of Cultural Space in the Glass Cultural Products*

Previously, the three attributes mentioned above have overlapping attributes, and the glass products can have either one of these attributes, two of them, or even all three attributes. On the other hand, previous literature reviews of cultural heritage have also suggested cultural heritage spatial analysis models: material level, behavior level, and meaning value. In other words, cultural heritage mainly has the following characteristics that can be used: aesthetic characteristics, which are mainly reflected in the material level of cultural heritage, such as sculpting, color, material, and pattern; the behavior level, which can correspond to the functional value in product design; the meaning level, which is mainly reflected in the user's emotional feedback after contact with cultural heritage. For example, at the material level, the triangle is extracted as a sculpture of cultural heritage, which can be applied after repeated arrangement as the aesthetic attribute of glass products. At the behavior level, take the historical artifacts as an example. The primary way people behaved then was to hold a ceremony with this water bowl. The transformation of this water-holding ceremony into a glass wine cup makes this product not only have the decorative elements of the plum blossom bowl on the material level but also retain this sense of cultural ceremony on the behavioral level, adding another layer of meaning to the cultural attributes of the product. At the meaning level, pursuing career promotion can be enforced by decorating traditional official costumes. The combination process of cultural heritage spatial analysis and glass product attributes can be seen in Figure 10.

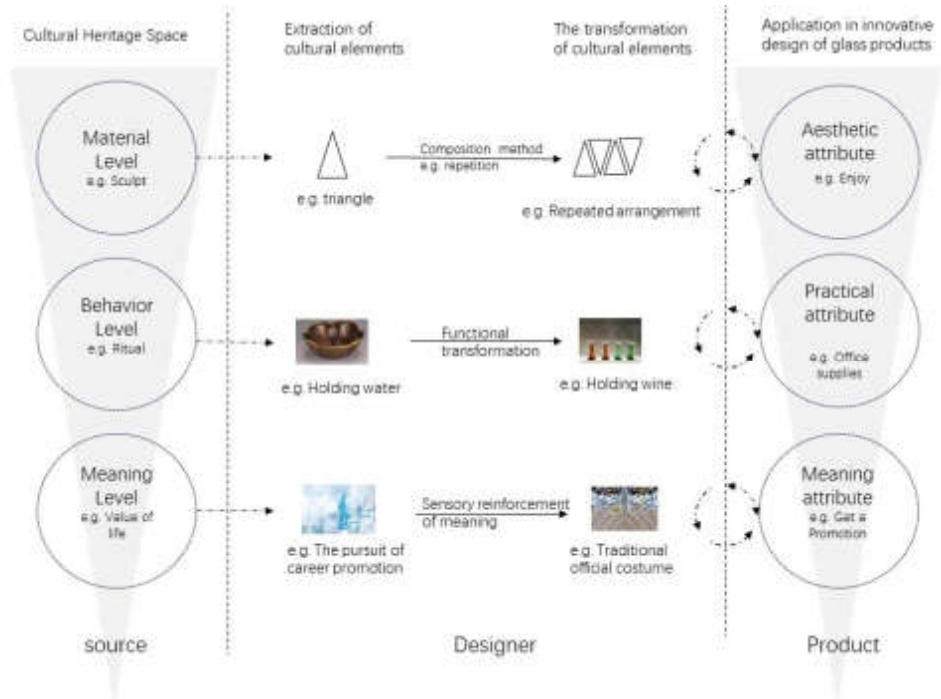


Figure 10: The combination process of cultural heritage spatial analysis and glass product attributes

Case Study

In this session, 27 representative products were selected, and case studies were made, all of which used the spatial analysis method of cultural heritage. These cases are selected from the three directions of school, studio, and market, and the selection criteria are representative of cases in the literature review and extensive observation. They all used the same model for analysis, taking the Palace Museum of China glass product as an example. The Palace Museum’s cultural and creative products are designed to adapt to more audience consumption, and the core of product positioning is to integrate cultural creativity into life.

First, the four steps of cultural heritage element decomposition proposed above were used to analyze it, as shown in Figure 11(a). Next, the cultural heritage background used in this glass product was investigated, as shown in Figure 11(b). Then, the representative objects in this cultural heritage are “Long,” “Feng,” and “Shizi.” Their material level of cultural gene analysis was analyzed, and the results can be seen in Figure 11(c)-(d). This cultural heritage’s meaning level is that it symbolizes eliminating disasters and evil, bringing good luck and justice. This cultural gene is symbolized and enhanced with the auspicious cloud symbol. The conversion process of the cultural genes behind this can be seen in Figure 11(e).

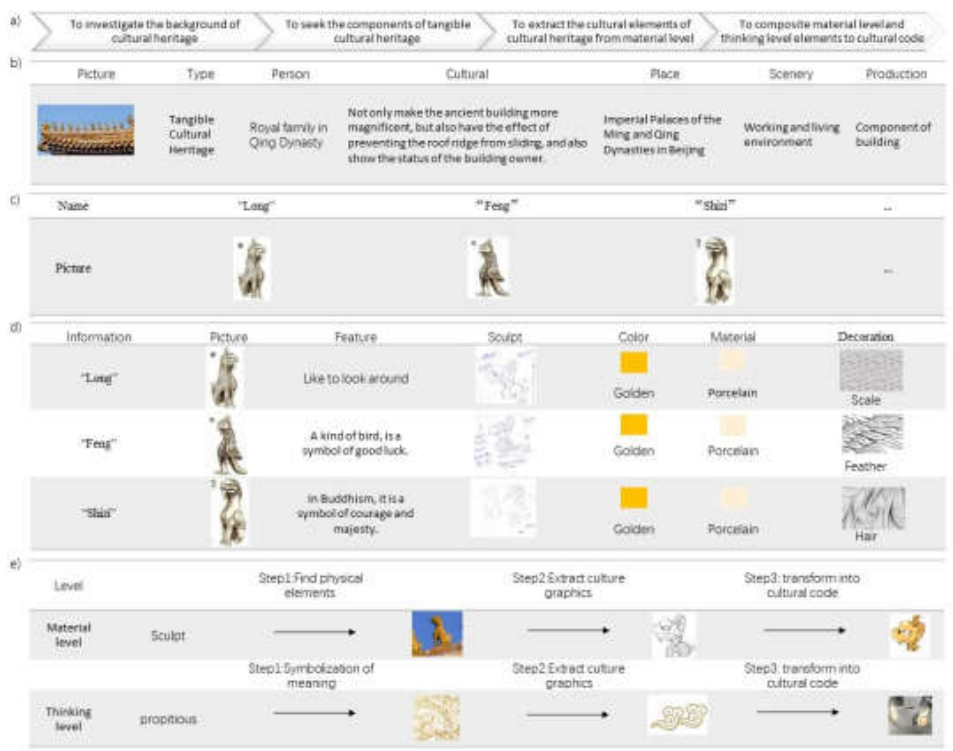


Figure 11: Proposed case decomposition steps (a) An Analysis of the Cultural Context (b) To seek the components of tangible cultural heritage (c) An analysis of the material level cultural elements (d) The conversion process of cultural codes (e)

To sum up, this glass product draws on three levels of cultural heritage: on the physical level, it borrows the appearance of “Long” and transforms it into a cartoon, which is also the main appearance feature of this glass product on the aesthetic attribute; On the behavioral level, the more stable function of preventing roof tiles from slide was converted into the pen holder function of the glass product, which is also one of the practicalities of this glass product; on the meaning level, people’s desire for good weather and good luck was expressed through traditional cloud patterns, decorating in the part of this glass product. The application progress of cultural heritage elements into glass products can be seen in Figure 12.



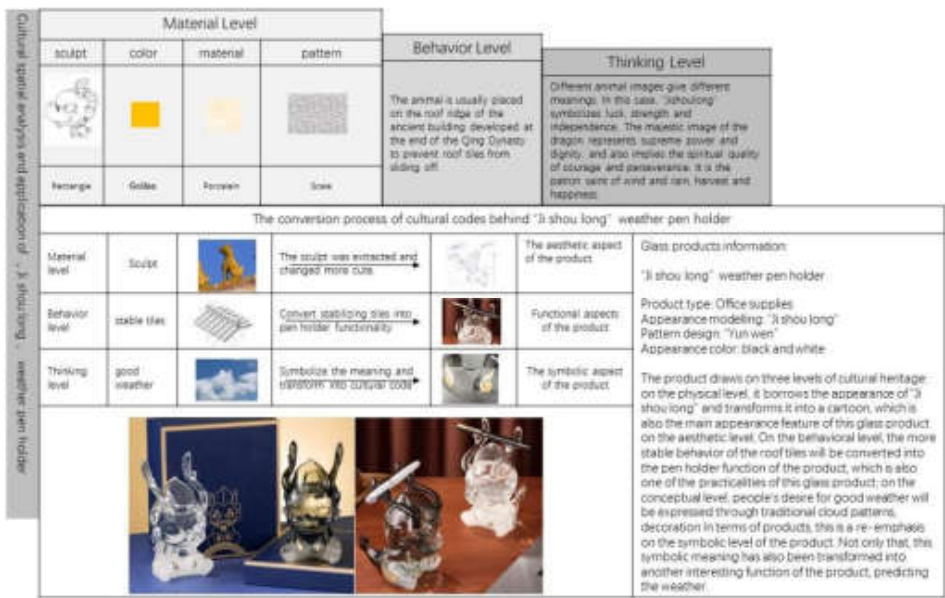


Figure 12: Application progress of cultural heritage elements into glass products

## Results

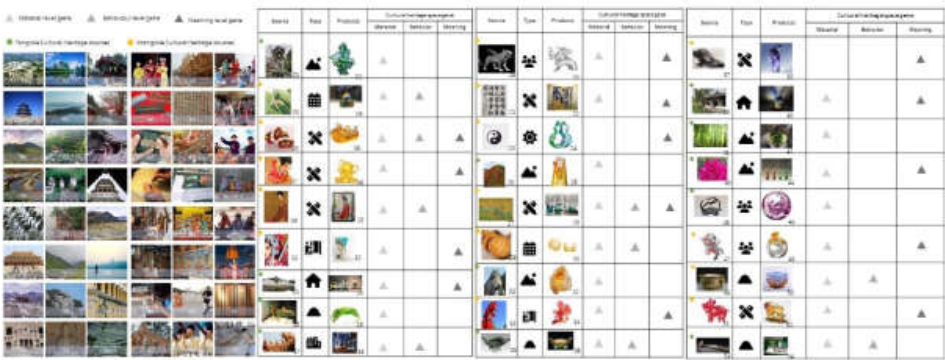


Figure 13: Classification and combination method of glass products with traditional culture are analyzed

The researcher identified 27 glass products embedded with Chinese cultural heritage elements based on the compilation and classification of glass designs with cultural heritage elements. These examples were classified by the types of elements embedded in them. Each glass product is analyzed according to the cultural heritage spatial analysis model, and the results are shown in Figure 13.



In the 27 cases of glass product design with cultural heritage elements, except for the elements of “Tai chi” and “ink painting,” which did not directly apply the material level, the others all exited the extraction and deformation of the shape, color or pattern in the cultural heritage. The reason for this is that the reception of visual information accounts for 70% of the information received by human beings, and the application of material-level elements is one of the most direct ways to make people feel the visual charm of cultural heritage.

In the cases investigated, 11 products have practical functions, and 6 of these glass products can be associated with the behavioral level of cultural heritage. The proportion of products with practical functions is relatively low in the cultural and creative glass products, unlike other cultural and creative products. This is because glass has unique material characteristics, so designers pay more attention to decorative glass products but ignore the practical function of the product development. However, from the feedback of Oracle Weather Storm Bottle Night Light and “Long” office supplies, glass products with certain practical functions are more likely to arouse consumers’ interest. From the results, the behavioral level of cultural heritage incorporating glass product design is relatively lacking in conscious application, which requires scholars and designers to study this area further.

Regarding the meaning level of cultural heritage, the results show that 9 out of the 27 cases investigated have cultural heritage elements applied at this level in glass products. The apparent difference from the other level is that the diversity of cultural heritage elements at this level was embodied in the form of visual components and functions. In other words, the re-strengthening of the meaning level is mainly achieved through visual elements. However, it cannot be ruled out that the re-strengthening of the meaning level is achieved through the practical function of the product, which is also one of the directions to be studied in the future.

## Discussion

From the above case analysis, we can observe the multiple applications of cultural heritage elements in glass product innovation: some products focus on a certain level of cultural elements, while others can cleverly integrate two or even three levels of elements. The reason behind this is that each product has its unique value and positioning, and designers strive to give the product more value and attributes. In the study of product consumption in sociology and anthropology, the role of people and the symbolic significance of products are emphasized, which coincides with the application of cultural heritage elements in glass product innovation that we are exploring. By endowing and transmitting cultural elements in cultural heritage spatial analysis, we can significantly enhance the added cultural value of glass products. This value is not only reflected in the aesthetic value

of the product, but also in the profound cultural connotations it carries. Social intervention plays a crucial role in this process.

Firstly, social intervention can help us better understand the public's awareness and needs for cultural heritage. By organizing cultural activities, exhibitions, lectures, and other forms, we can guide the public to have a deeper understanding of the value and significance of cultural heritage, thereby enhancing their sense of identification and protection of cultural heritage. This sense of identity and protection awareness will further promote the application of cultural heritage elements in glass product innovation, forming a virtuous cycle. Secondly, social intervention can promote the innovative application of cultural heritage elements. Designers and manufacturers can draw on the three levels of cultural heritage spatial analysis models - aesthetics, practicality, and cultural significance - to guide product design and innovation when developing new products. By incorporating cultural elements, not only can the cultural value of the product be enhanced, but it can also stimulate consumers' desire to purchase and sense of identity. In addition, social intervention can also help us better disseminate and promote the application results of cultural heritage elements in glass product innovation. Through media promotion, online promotion, and other means, we can make more people aware of these innovative products, thereby promoting the protection and inheritance of cultural heritage.

## **Conclusion**

This study is based on the cultural heritage spatial analysis model, and explores in depth how to extract cultural elements from three levels and combine them with the attributes of glass products, forming an innovative design method for glass cultural and creative products - the "Cultural Heritage Spatial Analysis Model". In order to verify the feasibility and universality of this model, we conducted an extensive sampling survey at the school, studio and market levels, covering 27 different types of glass products. Through this process, we have revealed the universal law of applying cultural heritage to the design innovation of glass products. By organizing cultural activities, exhibitions, lectures, and other forms, we aim to popularize cultural heritage knowledge to the public and increase their awareness and interest in cultural heritage. This will help inspire designers and manufacturers to use cultural heritage elements in glass product innovation. Guiding market demand and consumer preferences: Social intervention can guide market demand and consumer preferences through media promotion, online promotion, and other means, promoting the application of cultural heritage elements in glass product innovation. This will contribute to the formation of a market trend that combines cultural heritage elements with innovative glass products, promoting the protection and inheritance of cultural heritage. Social intervention can promote cross-border cooperation and communication between different fields, such as

culture, art, design, technology, and so on. This will help introduce cultural heritage elements from different fields into glass product innovation, achieving diversified integration and innovative development of cultural elements.

### *Acknowledgment*

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