

# Research on the Dynamic Application of Cultural and Creative Products based on Museum Resources

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## 박물관 자원에 기초한 문화 창작물의 활성화 응용 연구

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**Abstract** Museum is the carrier and symbol of history and cultural accumulation, and the museum cultural relics are clues with the spirit of history. Moreover, the museum cultural and creative products are portable history. Museum has changed form the traditional "object-basic" model to the modern "people-basic" model, which pays more attention to its living inheritance. Therefore, the museum cultural and creative products is also the way of expression of its living inheritance. This paper analyzes the opportunities and difficulties of cultural and creative products of Chinese museums by means of network survey, field survey and expert interview. In order to improve the design method of cultural and creative products. By exploring the cultural connotation, broadening the functional factors, innovating the design factors and creating the empathy factor between products and people to explore and the verify. Trying to make up the imperfect design methods of cultural and creative products in small and medium-sized museums which leads to the lack of function, innovation and communication of cultural and creative products. We try to attract more people's attention, spread traditional culture and realize the resonance between people and objects.

**Key Words** : Museum, Cultural heritage, Cultural and creative products, Design method, Design factors

**요약** 박물관은 역사와 문화 축적의 실체이자 상징이고 박물관 유물은 역사의 혼을 담고 있는 단서이며 박물관 문화 창작물은 언제나 가지고 다닐 수 있는 역사이다. 현대박물관은 전통 박물관의 '물중심'을 '사람중심'으로 변화시키고 그 활태전승에 치중하는데, 박물관의 문화 창작물은 활태전승의 일종의 표현 방식이다. 이 글은 인터넷 조사 연구, 현지 답사, 전문가 인터뷰 등의 방법을 통해 중국 박물관 문화 창작물이 현재 직면한 기회와 어려움을 분석하여 박물관 문화 창작물의 디자인 방법을 보완하려 한다. 박물관 문화 내포 요소의 발굴과 박물관 문화 창작물 기능 요소의 확대와 박물관 문화 창작물 디자인 요소의 혁신과 문화 창작물과 인간의 공감 요소의 제조에 의한 4가지 요소를 일체화한 디자인 방법으로 탐구하고 사례실천을 검증하여 중소형 박물관의 문화 창작물들이 디자인 기법 미비로 인한 문화 창작물 기능성 부족, 혁신성 부족, 전파성 부족 등의 단점을 보완한다. 더 많은 사람을 박물관으로 안내하고, 전통 문화를 전파선양하며, 인간과 유물, 인간과 인간의 공감대를 형성시킨다.

**주제어** : 박물관, 문화의 전승, 문화 창작물, 디자인 방법, 디자인 요소

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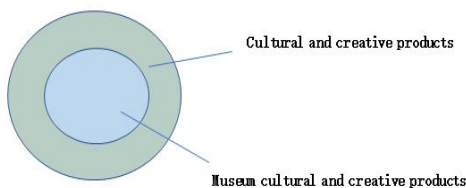
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## 1. Introduction

### 1.1 Current situation and analysis of cultural and creative products of museums

#### 1.1.1 Definition of cultural and creative products of museums

UNESCO defines cultural and creative products as the consumer products that express creative ideas, symbols and lifestyles [1]. As for “cultural and creative products of museum” a specific category “museum” is added based on the cultural and creative products. The design and research and development of cultural and creative products based on museum-related cultural and artistic elements are shown in Fig. 1. “Cultural and creative products of museum” is widely used at present, but this concept has not been strictly defined academically. With the changes of the times and background environment, the new museology has been put forward, and the cultural and creative industry of museums has achieved a good development in practice. The cultural and creative products of museums in China, led by the Palace Museum, become hot, and the term “Cultural and creative products of museums” begins to be widely used.



**Fig. 1. Relationship between cultural and creative products and museum cultural and creative products**

Many scholars have put forward their own opinions on the research of cultural and creative products of museums. In the existing literature, the term is found expressed in multiple forms, such as “museum cultural and creative products”

[2], “museum cultural products” [3], “museum cultural creative merchandise” [4], and “museum souvenirs” [5]. In foreign countries, museum cultural and creative products are usually called “museum store products”, which refer to the products sold in museum stores. Although there are a lot of products sold in museum stores, not all of them are innovative design products based on museum culture and there is the lack of cultural element.

In the doctoral thesis titled the *Development and Research of Cultural Creative Products of Museum*, Ling-yun Chen defined the cultural and creative products of museum as “special goods that integrate ornamental, memorial, practical value, use culture and art design of cultural relics, make innovative elements extraction and are sold in entity shop or electric business platform.” [6] However, with the development of the historical background and the trend of cross-border integration, the sales venues of cultural and creative products of museums are no longer limited to museum physical stores or e-commerce platforms. In its definition, the “special goods integrating ornamental, memorial, practical value” are mentioned, which is not strict enough. The ice cream of “Drumming and Rap Figure” and “Cloud Pattern and Melody” of the National Museum of China, which quickly becomes popular on the Internet this year, is not commemorative, because this food only has practical and aesthetic value. In view of the research in this paper, the author puts forward the definition of cultural and creative products in museums: “innovative products with certain aesthetic, commemorative or practical features designed and produced according to the relevant cultural and artistic elements of museums.”

### 1.2 Status quo and analysis of cultural and creative products of museums

The rise of cultural and creative industries is one of the latest trends of the world's cultural and economic development. Both the developed and developing countries regard cultural and creative industries as an important means of national economic transformation.

1.2.1 Analysis of the current situation of cultural and creative industry in foreign museums

In foreign countries, museums have become the most innovative public institutions in the field of culture and art. Cultural and creative store, also known as the "last exhibition hall" of museums, also puts forward higher requirements for the development of cultural and creative product of museums[7]. The chain expansion of the Guggenheim Museum in New York has given it a more complete catalogue and a wider audience. The Louvre Museum has transformed the underground space into a shopping mall and the museum IP into a public space that combines art and commerce. The British Museum is not only one of the most famous museums in the world, but also the originator of the development of cultural and creative products in museums. In 2015, its annual revenue of cultural and creative products was 200 million dollars. The Metropolitan Museum of Art in New York has a collection of up to 3 million pieces and is called the epitome of the world's art history. The annual sales of cultural and creative products of the Metropolitan Museum is as high as 400 to 500 million dollars, accounting for 80% of its total income, and the total number of cultural and creative products developed by the Metropolitan Museum is more than 20,000 [8]. To sum up, cultural and creative industry of foreign museums is one of the main sources of economic income of museums, and the development prospect of cultural and creative industry is relatively good.

1.2.2 Analysis of the current situation of cultural and creative industry in Chinese museums

In the era of "Internet +", the cultural and creative products of museums convey Chinese culture and creativity to the whole world with the help of new technologies and platforms, which is an important way to establish national image, promote Chinese culture and show China's strength. Some museum cultural and creative products are presented as "national gifts" and "provincial gifts" to foreign guests. According to the data released by the National Bureau of Statistics, the added value of national culture and related industries was 4,436.3 billion yuan in 2019, accounting for 4.5% of GDP. Cultural and creative industries have been increasing year by year (Table 1) and have become an important part of Chinese economy.

**Table 1. Data statistics of national culture and related industries**

particular year	Added value of cultural industry (100 million yuan)	Increase over the previous year	Proportion in GDP	Increase over the previous year
2010	11052	---	2.75%	---
2011	13479	21.96%	2.85%	0.10%
2012	18071	34.07%	3.48%	0.63%
2013	21351	18.15%	3.63%	0.15%
2014	23940	12.13%	3.76%	0.13%
2015	27235	13.76%	3.97%	0.21%
2016	30785	13.03%	4.14%	0.17%
2017	34722	12.79%	4.20%	0.60%
2018	41171	18.57%	4.48%	0.28%
2019	44363	7.80%	4.50%	0.20%

In recent years, the development of cultural and creative industry of museums in China has ushered in new opportunities. The major cities across the country have mushroomed to launch relevant policies and measures to boost the development of cultural and creative industry. For example, in May 2016, *the Notice of Several Opinions on Promoting the Development of Cultural and Creative Products in Cultural and Cultural Relics Units* (State Development Administration [2016] No. 36) was issued. The

document not only puts forward specific requirements for the development of cultural and creative products, but also encourages cultural and cultural relic units at all levels to take the initiative to develop cultural and creative products by utilizing the museum's cultural resources, so as to promote the dissemination and sharing of excellent cultural resources [9]. In May 2021, the *Guiding Opinions on Promoting the Reform and Development of Museums* were issued, which proposed that "the museum undertaking should be actively integrated into the overall situation of national economic and social development, and the transformation and dissemination of archaeological and historical research achievements should also be strengthened" [10].

According to the incomplete statistics, more than 2,500 museums, art galleries and memorial halls in China have been engaged in cultural and creative development, and 92 museums have been included in the pilot units of cultural and creative development. In 2017, the Palace Museum's revenue reached 1.5 billion yuan, followed by Shanghai Museum's 38.62 million yuan, Dunhuang Museum's 17 million yuan, and Suzhou Museum's 14 million yuan, with the annual growth of 40-50%. In 2018, the cultural and creative product development income of national museums was about 4 billion yuan, and the types of cultural and creative products developed exceeded 40,000 kinds [11].

Although the cultural and creative industry is thriving, there is still a huge danger whirlpool. According to the art market magazine, as of December 2016, 2,256 museums have been recognized by relevant national institutions to possess the capability of cultural and creative product's development and industrial scale, of which only 18 are profitable, less than 1% [12]. More than 70% of museums in China have less

than 5 million yuan in annual sales of cultural and creative products, most provincial museums have less than 1 million yuan in annual operating income of cultural and creative products, and some even have only tens of thousands of Yuan. In terms of regional distribution, the exploration of cultural and creative development is mostly concentrated in provincial and provincial capital city museums, but few in prefecture-level and county-level cities [13]. Through investigation, the author found that nearly half of the museums in China are engaged in cultural and creative development, and only the Palace Museum, Suzhou Museum, Dunhuang Museum, Sanxingdui Museum and other powerful large museums have a good income. The design and research and development of cultural and creative products of museums should not only be the patent of big museums in the first-tier cities. However, due to the shortage of funds, lack of talents, weak collaborative creative research and development ability and many other problems, the cultural and creative development of many museums in China is facing great challenges.

## 2. Research methods of museum cultural and creative products

### 2.1 Network survey method

By comparison, China has a larger number and scope of e-commerce platforms. In South Korea, sales are mainly carried out through official websites of museums, such as the National Central Museum, while in China, sales are carried out through multiple channels, such as Tmall, JINGdong and the official website of museums. China's online information is more comprehensive, through the statistical analysis of tmall, JINGdong official shopping platform. Based on the analysis of online store

subscriptions (Fig. 2), most people still focus on several national and provincial museums, while cultural creations of small and medium-sized museums in prefecture-level cities are almost nowhere to be found in the search homepage. Through the classification and sorting of cultural and creative products sold by more than 40 museums at all levels in China, they can be basically divided into creative home furnishing, clothing and accessories, office stationery, cosmetics, digital, etc. Then, part of representative products under each category are selected, and a total of 30 products have been chosen for induction (Table 2). The types of cultural and creative products are still concentrated in large museums, while those of small and medium-sized museums are relatively single, less innovative and more homogenized.

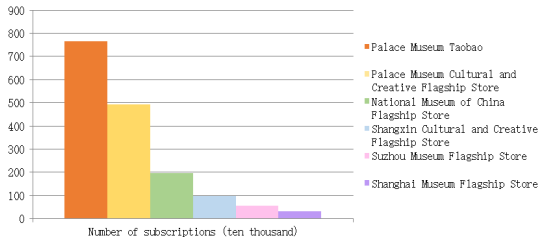


Fig. 2 . Number of subscriptions of Tmall Cultural Innovation Store

Finally, according to the analysis of the sales situation of cultural and creative products in online museums, this study found that the price advantage of the products takes the first place. In addition, the products with high sales volume are generally low in price and can be accepted by most people’s consumption ability. According to the analysis of product performance, the product pays more attention to practicality and innovation, daily application is more frequent, and there are many selections for the public. Regarding the appearance of products, it is essential to pay attention to culture and

aesthetics, and carry out story-driven and aesthetic innovation in the process of product research and development, so as to make the public more interested.

Table 2. Statistical analysis of some museum categories

Category	Details	Image	Details	Image	Details	Image
Clothing accessories	Scarves		The package		Bracelet	
	Brooch		Blindfold		Ring (Necklace)	
Quality of life	Hold the pillow		Tea		Tea bags	
	Floor mats		Little night lights		Umbrella	
Creative stationery	Notebook		Neutral pen		Folder	
	Tape		Bookmark		Postcards	
Makeup	Mask		Lipstick		Eyebrow pen	
	blush		Mirrors, combs		Eye shadow	
Digital	Watch		Mouse pad		Charging treasure	
	Phone case		Digital collection bag		Tablet case	

## 2.2 Field Investigation Method

Cultural and creative products are not only the carrier of the connection between museums and cultural industry, but also an important carrier of the long-term connection and interaction between museums and audiences. At present, actively building a scientific cultural and creative system has become a top priority. In order to explore the cultural and creative product design of the museum. I by the method of field investigation, field investigation on museum, visited South Korea’s national museum, national museum of the central six museum,

China's JiWenHua museum, qingzhou museum, such as 9 museums, and to visit the field visit and questionnaire investigation, Listen to the public's satisfaction and expectations for the museum's current cultural and creative products. There are many offline culture stores in Korean museums. Basically, each museum will display related series of products for long-term and temporary exhibitions, paying more attention to aesthetics and practicality. However, online e-commerce sales are relatively simple. Online sales channels in China are wider and more convenient for people to buy. However, cultural and creative products of local museums are in a difficult position at present. The products are slightly single, lack of innovation and serious homogenization. In general, there is a lack of innovation in the design and research of cultural and creative products in modern museums. Some forms are more than content, and cultural connotation is not enough. Cultural and creative products are not enough to arouse the resonance of the audience.

### 2.3 Expert interview

In order to further understand, I invited experts in the industry to conduct interviews. In China, I visited Li Yaqun, curator of Shandong Art Museum, Deputy Secretary of The Party Branch of Qi Culture Museum, Li Guanglan, curator of Tengzhou Art Museum and an expert in the research and development of cultural and creative products of the museum, Liu Hongqiang, visiting professor of The Party School of the Ministry of Culture and Tourism and head of Fengmei Culture Media Company. Gu Xuliang, general manager of Xi 'an Ninth Symbol Culture & Technology Co., LTD and other 6 experts are members of the Entrepreneurship talent Pool of the Ministry of Culture and Tourism. Through the integration of the interview, I drew the conclusion that small

and medium-sized museum's cultural creative industry is currently facing the plight of lacking financial support and creative design talent, leading to unsystematic product design as well as product without meaning, innovation and income, and forming a vicious cycle. The key to breaking this vicious cycle lies in the design and development of cultural creative product.

## 3. Innovative design and active application of museum resources

At present, the cultural and creative industry of museums is developing rapidly. Through the above research and analysis, cultural and creative products are still facing problems, such as the lack of cultural connotation, imperfect functionality, weak innovative design and insufficient communication, which cannot well meet the material and spiritual and cultural needs of the public. Cultural and creative products of museums are innovative products with certain aesthetic, commemorative or practical features designed and produced by condensing and enhancing the relevant cultural and artistic elements of museums. New museology advocates changing the traditional content-centered mode to "person-centered mode, and focuses on the user's emotional experience. This paper analyzes the design method of cultural and creative products of museum, provides reference for the museum's cultural and creative product design, and solves the problem such as the shortage of talent and innovation.

### 3.1 Theoretical research on the design and development of museum cultural and creative products

#### 3.1.1 Maslow's theory of demand

It is necessary to understand human nature and grasp its surface demand and potential

demand, so that any product can be deeply rooted in the hearts of people. Only by grasping the real needs of users can the products enter the depths of the soul of users. When talking about this, we tend to first think of the hierarchy of needs theory proposed by Maslow (A.H.), which emphasizes that human motivation is determined by human needs. The level of needs is divided into five levels, and the physiological needs of the lower level are also rigid needs formed and satisfied step by step. "Physiological needs" and "safety needs" are called "missing needs" level, which are the most basic instinctive needs of human beings. Indeed, users' instinctive needs should be considered first in the design of cultural and creative products. "Love and belonging", "respect needs" and "self-actualization needs" are collectively referred to as the "growth needs". The enlightenment in the design of cultural and creative products is that we need to pay attention to the design behavior of products, so that products and users can finally achieve empathy. People in each period will be dominated by one need, while other needs will be in a subordinate position. The development of cultural and creative products of museums also needs to correspond to users' needs one by one, which is consistent with the level of users' needs of cultural and creative products of museums.

### 3.1.2 User experience hierarchy theory

The user experience hierarchy theory mainly comes from Maslow's theory of needs, and the two complement each other. The book *Elements of User Experience* introduces five elements of user experience, which are promoted from the bottom level to the bottom level, and ultimately consider the actual experience of users as well as the empathy between products and users. According to the user experience hierarchy

theory, the design and development of museum cultural and creative products should also pay attention to the application of this theory.

### 3.1.3 Design level of museum's cultural and creative product

Benny Ding Lcong (2003) formulated a simple framework for studying cultural objects. In his view, cultural levels are divided into three different levels: the external level of "tangible and material", the intermediate level of "behavior and custom", and the internal level of "intangible and spiritual" [14]. Based on the previous studies, the author believes that museum cultural and creative product design can also be divided into three levels, and there is a one-to-one correspondence, as shown in Figure (3). The theory of user experience hierarchy comes from Maslow's five hierarchy of needs theory, which conforms to the development law of people from instinct layer (functional needs), behavior layer (design needs) and empathy layer (emotional needs). When designing cultural and creative products, museums should first consider the needs of users from the perspective of users, start from the most basic missing needs, and pay attention to the functionality of products corresponding to the strategic layer and the scope layer, which belongs to the instinctive level. Furthermore, it is necessary to consider the behavioral layer of the product to meet the design requirements, and finally make the product and users achieve empathy and meet the emotional needs.



Fig. 3. Correspondence among the three

### 3.2 Factors related to the design and development of museum cultural and creative products

The design of cultural and creative products of museums has certain particularity because its carrier is museums. Based on the cultural elements of museums, cultural innovation, functional innovation and design innovation are adopted to achieve empathy between products and users, so as to realize creative transformation of museum cultural resources and active application of cultural resources in collections. This paper focuses on the design method based on the integration of culture, function, design and empathy. As shown in Fig. (4), this study will conduct specific exploration and analysis from the following aspects.

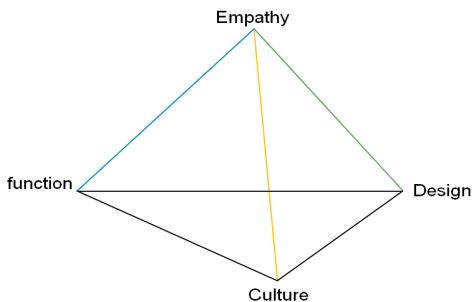


Fig. 4. Four factors of museum cultural and creative product design and development

#### 3.2.1 Exploration of the cultural connotation of the museum

Museum collection cultural resources are valuable spiritual wealth of historical accumulation and cultural inheritance, and museum cultural and creative products are the manifestation of its materialization. Cultural and creative products are the material needs of the masses, while culture is the spiritual needs of the masses. Cultural and creative products should fully respect history and culture, rely on collections, integrate “stories” with cultural

connotations, and make cultural elements run through the whole design process.

Through market research, it is found that some cultural and creative products attach too much importance to their external formalism without in-depth analysis of their cultural elements. As there are too many cultural elements in museums, it is sometimes difficult to select them in product design. In the design, it is essential to dig cultural elements and find cultural elements and ways that are easy to express, spread and carry forward. According to the particularity of cultural relics exhibited in the museum, the cultural elements of the museum can be analyzed from three aspects: time context, social level, and cultural function (Fig. 5). Designers can sort out the time sequence of museum relics and analyze their cultural background according to the evolution of dynasties. The social attributes of culture can be divided into official culture and folk culture. Designers can also find design elements for inspiration in this direction, make positioning analysis on the later cultural and creative products, seek inspiration according to the functions of cultural relics, such as ancient weapons, living utensils, and clothing, make functional and targeted product design, and let everyone see the cultural element, feel and understand its cultural connotation.

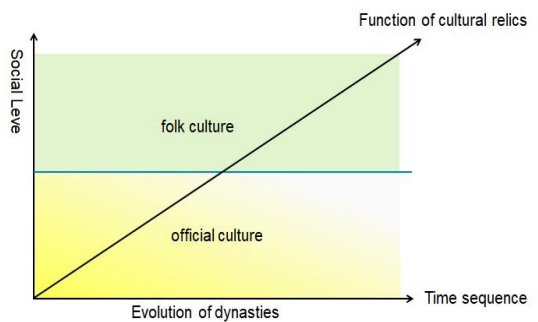


Fig. 5. Cultural factors of museum cultural and creative product design



### 3.2.2 Expanding the functional factors of cultural and creative products of museums

The aim of design is servicing the public. The ultimate goal of cultural and creative products of museums is to spread and promote culture through sales and circulation. According to the research and analysis, 80% of the audiences will consider their functional elements first when buying them. Functionality is the foundation of a product. Based on the statistics of cultural and creative products sold in more than 40 museums' cultural and creative stores online, the author found that their functions mainly cover practicality, aesthetics, education and entertainment, and the best product design integrates the four factors (Fig. 6). This paper takes the Palace Museum's cultural and creative product "Palace Museum Calendar" as an example for analysis (Fig. 7).

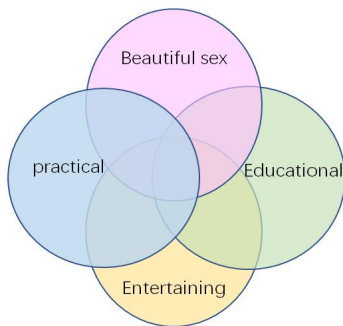


Fig. 6. Functional factors of museum cultural and creative product design

#### 3.2.2.1 Practicability

Design and life should be closely linked, and making life better through design should not be an empty talk. Design should focus on life, and show ordinary and pleasant life quality in a simple way, so that the purpose of improving life by design can be achieved [15]. The practicality of cultural and creative products in museums belongs to people's basic needs and is also one of the factors that people consider first. The practical product is to realize its purpose

and has the use value. If a product has no practical value, it will lack the possibility of dissemination. For example, the Palace Museum calendar ranked first in the comprehensive sales ranking, with more than 100,000 sales ranking, and it ranks top three every year. In ancient China, there was a high level of calendar. In the Northern and Southern Dynasties, it was a record of all the words and deeds of emperors in their whole life. In the Tang Shunzong period, it was a "notebook" that recorded the words and deeds of emperors every day. The calendar of the Palace Museum (Fig. 7) is designed as a collection of almanac, exquisite catalogue and notepad. The calendar presents the 24 solar terms and 72 phenology of China, which is convenient for the public to use in daily life. The calendar is designed for 32 accounts, which can be written freely and taken as a mood essay to record the daily drip. Only when the almanac is used can the knowledge, culture and values it carries be spread.

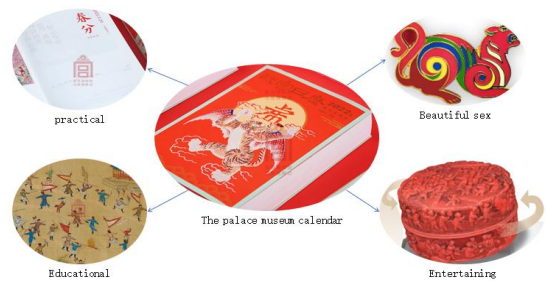


Fig. 7. The palace museum calendar

#### 3.2.2.2 Aesthetics

Cultural and creative products in museums are objects that convey ideas, symbols and ways of life to consumers. These ideas, symbols and ways in life are reflected in artistic, aesthetic, symbolic and spiritual values through cultural goods and services [16]. The design of cultural and creative products should be considered from the perspective of users. With the progress of

the times and the development of society, people's aesthetic level is gradually improving. The design of cultural and creative products in museums should not only consider the traditional cultural elements of cultural relics themselves, but also conform to the aesthetic concept of modern people. Take the design of the Year of the Tiger in the Palace Museum calendar (Fig. 7), the cover picture is taken from the Collection of the Palace Museum "Flying Tiger Flag of Qing Dynasty with Red Yarn Embroidered Moire", and there is also the Year of the Tiger emblem. Designed with enamel technology, it is exquisite and meticulous. In traditional Chinese culture, the tiger is the king of mountains and beasts and the leader of all animals. Since ancient times, it has been regarded as a symbol of vitality and glory to ward off evil spirits, wish for good luck, peace and prosperity. This implication can be easily accepted by people, attract the attention of the public, and meet the needs of people's life aesthetics, so as to spread the culture of beauty. Only by bringing culture into daily life and gaining lasting vitality can the daily life have the carrier of aesthetics.

### 3.2.2.3 Education

Education is the mission of the museum itself. New museology advocates that museum should shift from "cultural relics centered" to "people centered" mode, and its function should shift from "research centered" to "education centered" mode accordingly. The author believes that the museums not only have certain educational orientation for the public, but also show people our dusty history and traditional culture, so that the design and development of cultural and creative products in museums should have certain educational orientation. Cultural and creative products are the effective extension of

cultural resources in the collection, which have a strong publicity effect and can play a more in-depth and appropriate educational role. For example, the Palace Museum calendar for the Year of the Tiger (Fig. 7) takes "Auspicious Tiger Ushering in the New Year, and Celebrating the Prosperity of Mountains and Rivers" as the theme. The calendar selects the cultural relics collected by the Palace Museum to show the tiger as well as its weapons, riding and shooting and sports, and presents 365 pieces of tiger artifacts, paintings, accessories, clothing and other cultural relics of different dynasties, types and materials. A calendar presents the rich connotation of Chinese tiger culture. Then, it is extended to cultural relics representing mythical animals, fierce beasts and cute cats, and then to cultural relics reflecting martial arts, equestrian shooting and sports with "vitality". Finally, it is featured in *Ice Hipptu*, echoing the upcoming 2022 Beijing Winter Olympics. Every collection of pictures has short text description, integrating ancient art in modern life. In this way, the calendar presents a lively life history, becomes a "knowledge popularization type", and is suitable for the reading of public and even collection of extraordinary calendars.

### 3.2.2.4 Entertaining

With the growth of people's spiritual and cultural needs, entertainment has become one of the consumption points. With the continuous extension of museum functions, it has certain characteristics of public welfare, education and entertainment. Cultural and creative products in museums also play an entertaining role. The entertainment of cultural and creative products in museums is mainly reflected in the interaction between the products and the public, so that users can feel that they not only buy a product, but also participate in a situational

interactive experience. For example, AR technology is introduced in the Palace Museum Calendar (Fig. 7). By scanning the calendar cover with a small program, people can see the scene that the moire flying tiger on the cover magically rises from static state. The use of AR technology can not only make the ancient painting “move”, but also bring a new experience to the cultural heritage. For each month of the year, the calendar will unlock a new “AR National treasure”. Moreover, 12 cultural relics are like treasures waiting to be discovered by readers, allowing surprises to continue throughout the year. Readers simply scan the corresponding patterns with a small program, and then the national treasure “pop out” on the paper, as if the real thing is in front of them. Whether it is a peacock green and blue glaze cat, or Qianlong-style carved red 100-child figure round box, the texture and color are realistic, and a real light and shadow effect will be presented through rotation view. Various static ancient masterpieces will also be transformed into a series of interesting animations, interpreting wonderful historical stories. While reading paper books, people can also enjoy online digital calendars. In short, the cultural and creative product can bring users a year of product use entertainment, truly consider the needs of users, and pay attention to user experience.

### 3.2.3 Design factors of cultural and creative products of innovation museum

Cultural and creative industry is both an opportunity and a challenge for museums around the world. Museums in small and medium-sized prefecture-level cities should also explore the path of cultural and creative industry. However, due to financial problems and insufficient R&D team talents, product

design innovation is not strong. The design of cultural and creative products is a crucial turning point in the production process of the whole product, which belongs to the behavioral level. The following part will explore and analyze the design factors of cultural and creative products.

#### 3.2.3.1 Design elements

In the design stage of museum cultural and creative products, firstly, design elements contained in museum resources should be excavated and constituent elements extracted. Furthermore, design elements can be extracted from the recognizable lines, textures, patterns, colors and shapes of archetypal cultural relics to transform them into visual symbols, and creative design of cultural and creative products can be carried out through overall application, partial interception and structural restructuring.

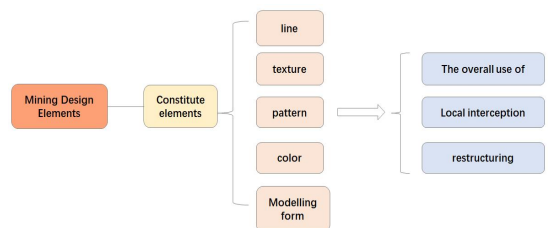


Fig. 8 . Design element diagram of cultural and creative product design of museum

#### 3.2.3.2 Design Thinking

The change of thinking can inject new vitality into products and seek new positioning. The design of museum cultural elements usually includes three ways of thinking: representation thinking, transformation and improvement, and interpretation of meaning. Representation thinking is the most intuitive and simple way of thinking to reflect the image and characteristics of products. The representational thinking design mostly adopts the cultural relics collected

in museums, which has a certain degree of popularity and recognition. Based on the composition elements of the cultural relics collected, the overall application and replication of partial interception are carried out. The products are visually intuitive and easy to be understood and accepted by the public. However, with the improvement of people's demand for product richness and innovation, design thinking begins to transform and improve the innovative design of design elements based on representation thinking. By restructuring the structure of the cultural elements of the museum, cultural elements are integrated into the product design in the form of symbolism and totemization, and innovations are made in terms of shape, color and function. Audiences of museum's cultural creative products are extensive. In addition to meeting the basic needs of the masses, higher demand should be meeting the demand of the public spirit. Then, it reaches the meaning interpretation stage of products, which will make products reach the empathy with the user, and let the public understand the story behind the product as well as the cultural connotation and meaning conveyed.

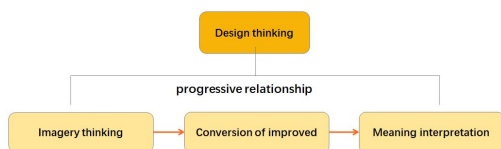


Fig. 9. Design thinking factors of cultural and creative products of museums

### 3.2.3.3 Design category

Through network research method, 45 representative online museums are selected for data statistical analysis on the official shopping platform of Tmall. In the category of cultural and creative products of the museum, the number of creative home furnishing cultural and

creative products is 32, the number of clothing and accessories cultural and creative products is 26, the number of office stationery cultural and creative products is 24, the number of theme series cultural and creative products is 13, the number of digital cultural and creative products is 6, the number of color makeup cultural and creative products is 5, the number of stamp products and books is 5. Other individual categories are less. Through the analysis of category occupancy, this study considers that the design of museum cultural and creative products should fully consider customers' consumption intention. Good design products can be purchased and disseminated only when they win the recognition of users. In the design process, it is essential to focus on the influence of category factors on the design and sales of cultural and creative products.

Table 3. Category research of cultural and creative products in online museums

category	number	content
Creative home	32	Throw pillows, tea sets, tea bags, floor MATS, night lights, umbrellas**
Clothing accessories	26	Scarves, brooches, bracelets, eye masks, rings, necklaces**
Office stationery	24	Notebooks, pens, folders, tape, bookmarks, postcards**
Digital class	6	Watch, mouse pad, power bank, mobile phone case, digital storage bag**
Colour makeup	5	Facial mask, lipstick, eyebrow pencil, blush, mirror, comb, eye shadow**
Stamp books	5	Books, calendars, brochures, postcards, greeting cards**
Collection of selected	4	Xiangbo Collection, high-end decoration, literati painting and calligraphy**
...	...	...

### 3.2.4 Creation of empathic factors between cultural and creative products and people

The design of cultural and creative products in museums should be “people-oriented” and pay attention to users’ sense of experience, so as to achieve empathy between works and people. Museum cultural and creative products are not just a product. Designers should set a situation, tell a story, write a script, and finally produce a product. A good product should also have certain emotional characteristics, which can make people feel the exquisite emotions conveyed. When the public sees the product, they will generate an overall impression on the product’s shape, color, culture and other aspects through visual, auditory, tactile and other sensory factors, and have empathy with the work. However, since everyone has different cognition, culture, values and so on, their emotional needs will be different. Therefore, for different audience groups, we should consider the emotional needs of the audience group of the product, in order to bring different emotional needs.

### 3.3 Museum cultural and creative product design case practice

The Palace Museum has been leading the trend of cultural and creative product design in Chinese museums, and it has a dedicated team to design and develop cultural and creative product design. However, small and medium-sized museums usually do not have enough funds and talent support. It is essential to improve and promote the design methods of cultural and creative products of museums, and enable more people to participate in the design of cultural and creative products of museums more deeply. This paper takes Qi Culture Museum as an example, and asks students to design cultural and creative products based on

the above analysis of the four factors in the design method of museum cultural and creative products.

Take Yeosu cultural creative design as an example. The design and development of cultural and creative products of museums should first fully understand the characteristic cultural connotation of museum collections, make precise positioning in the early stage, select the most characteristic and typical cultural elements, and determine the right direction for creative research and development[17]. In addition, the cultural factors of Qi Culture Museum are excavated, the most representative cultural elements favored by users are selected through user survey questionnaire, and analysis is made from time context, social level, and cultural relic function. “Yeosu” is a bronze inlaid with gold and silver in the Warring States period. It is the treasure of Linzi Qi Culture Museum and is called “national treasure yeosu”. Its shape resembles a calf, and “sacrificial” is a solid-color animal used in ancient temples for sacrifice. “Zun” is the ancient wine ceremony. Yeosu is a wine vessel “carved in the shape of a sacrificial cow to serve as a sacrifice” [18].



Fig. 10 . Extraction of "xizun" form

Secondly, the design factors of cultural and creative products of the museum should be innovated, and patterns should be extracted according to their shapes and patterns depicted on the body, so as to transform and improve them(Fig.10). The utensil itself is bronze, and the color on the body is lost due to a long time, so that the color scheme can be designed. In the

design process of product function, it is essential to fully expand the functional factors of cultural creative products of museum, select the appropriate category for series design such as notebook, tape, calendar and massager, print JiWenHua series knowledge in the notebook and the calendar of China, achieve practicability and aesthetics of the products, and make the products achieve empathy with the user. Through the analysis of the design methods of cultural and creative products in museums, it is hoped that everyone can understand and participate in the design, design their own unique cultural and creative products, and understand the connotation and inheritance of museum culture(Fig. 11).



Fig. 11 . "xizun" cultural creation design

#### 4. Conclusion

Cultural and creative products of museums are another way of communication, an important way for museums to achieve profits, and a significant carrier of long-term connection and interaction between museums and audiences. Under the background of continuous development and functional expansion of museums, this paper makes a profound analysis on the current status of cultural and creative products of museums. By comparing the current situation of cultural and creative products of museums at home and abroad, this paper analyzes the opportunities and difficulties encountered by cultural and

creative products of museums at home and abroad through the methods of network survey, field survey, expert interview and comparative analysis. With the case study of cultural and creative products of Chinese museums, the design method is expected to provide reference for designers, the development of cultural and creative industries of Chinese museums and museums in Korea and the world at present, and promote the innovative design and active application of museum resources.

The research of this paper, from the designer's point of view, should be user-centered. Through the design method of "four factors as one" explored in this paper, emphasis is placed on increasing cultural connotation, practical value and design aesthetics of cultural and creative products, so as to make the cultural and creative products of museums interact with the daily life of the public, enhance their cultural, practical and experiential characteristics, and achieve their active application. For the cultural and creative industry of Museums in China, cultural and creative design of museums should not only be the right of big museums in first-tier cities. Small and medium-sized museums should deeply explore their own characteristics and advantages, follow the trend of cultural and creative product design, and form joint research and development with local governments, enterprises and schools according to the design methods of cultural and creative products. Aiming at the cultural and creative industry of Korean museums, product design should be improved according to the design method, so that more people can participate in the design, and online and offline sales strategies should be promoted to promote the spread and promotion of products. Under the current global environment of active development of cultural

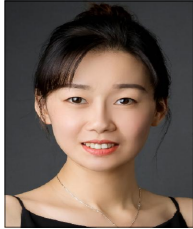
entrepreneurship industry, museum cultural and creative product design should pay more attention to the realization of cultural characteristics and differences. In the practice of continuous improvement, in order to form a certain paradigm, guide more students and the younger generation into the traditional culture, into the museum, everyone involved in cultural and creative product design, to achieve empathy between people and objects.

## REFERENCES

- [1] T. Li. (2017) . Rational Thinking about Cultural And Creative Work in Library. *Library Work and Research*. (2), 9-13.  
DOI : 10.16384/j.cnki.lwas.2017.02.002
- [2] S. C. Chiou & Y. C. Wang. (2018) . The example application of genetic algorithm for the framework of cultural and creative brand design in Tamsui Historical Museum. *Soft Computing*, 22(8), 2527-2545.  
DOI : 10.1007/s00500-017-2507-9
- [3] M. H. Huang , W. Houng & R. Lin. (2011). Exploration of the Cultural Product Design of the National Palace Museum from a Qualia Viewpoint. *International Conference on Design and Global Development*, 6775, 65-74.  
DOI : 10.1007/978-3-642-21660-2\_8
- [4] M. Wei, T. Chen & Y. Hsieh. (2019). Study of Cultural Creative Merchandises of Museums and Cultural Heritage. In *Advances in Graphic Communication, Printing and Packaging* .(LNEE 543). pp. 447-451.  
DOI : 10.1007/978-3-030-06185-23
- [5] I. Trabskaia, I. Shuliateva, R. Abushena, V. Gordin & M. Dedova. (2019). City branding and museum souvenirs: towards improving the St. Petersburg city brand. *Journal of Place Management and Development*, 529-544.  
DOI : 10.1108/JPMD-06-2017-0049
- [6] Lingyun Chen. (2018). *Research on Museum Creative Product Development*. Doctoral dissertation. Shanghai University. Shanghai, China.  
DOI : CNKI:CDMD:1.1018.271512
- [7] J. F. Li .(2020). Development and inspiration of cultural creative products in foreign public libraries. *Hebei science and technology park*, 33(1), 40-43.  
DOI : 10.13897/j.cnki.hbkjty.2020.0007
- [8] Zhe jiang Creative Design Association. (2019) . *Overview of IP operation of world famous museums*.  
[https://www.sohu.com/a/306931133\\_120066051](https://www.sohu.com/a/306931133_120066051)
- [9] State Affairs Office Of The People's Republic of China, No.36. (2016). *Notice of Several Opinions on Promoting the Development of Cultural and Creative Products in Cultural Relics Units.*.  
[http://www.gov.cn/zhengce/content/2016-05/16/content\\_5073722.htm](http://www.gov.cn/zhengce/content/2016-05/16/content_5073722.htm)
- [10] Trends of Social organizations in China. (2021). Guidelines on promoting the reform and Development of museums. *Cultural relics blog*.  
<https://baijiahao.baidu.com/s?id=1700841254718450252&wfr=spider&for=pc>
- [11] X. Q. Ma .(2020). Research on the integration design of regional culture and museum cultural and creative products. *Journal of the Staff and Worker's University*. 109-112.  
DOI : 1671-1440(2020)06-0109-04
- [12] Y. Ma. (2017). Is the Spring of Cultural Innovation in National Museums Coming? *Interface news.*.  
<https://www.jiemian.com/article/1203254.html>
- [13] Y. F. Zhao. (2020). Theory and Practice of Chinese Museum Cultural Creative Product Development. *Shandong Social Sciences*, 169-176.  
DOI : 10.14112/j.cnki.37-1053/c.2020.04.025
- [14] B. D. Leong. (2003). A New Approach to Design Thinking Based on Knowledge and Practice-A Dialogue. *Designissues*, 19(3), 48-58.  
DOI : 10.2307/1511964
- [15] Y. Xu & X. Y. Lu. (2018). Design Strategy of cultural and creative products based on the Concept of Daily use is Tao. *Packaging Engineering*, 176-180.  
DOI : 10.19554/j.cnki.1001-3563.2018.18.033
- [16] H. Q. Xu. (2017). Discussion on cultural Attributes of cultural and creative articles in art Museums. *Art Observation*, 8-10.  
DOI : CNKI:SUN: MSGC.0.2017-12-003
- [17] Z. Zhou. (2016). Discussion on cultural creation of Museum. *Decoration*, (4), 46-51.  
DOI : CNKI:SUN:ZSHI.0.2016-04-014
- [18] Collection introduction of Qi Heritage Museum Exhibition Hall. (1982). *Official website of Qi Heritage Museum.*.  
<http://www.qiheritagemuseum.com/product/36.html>

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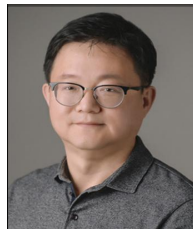


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