



# Analysis of the Domestic Cultural and Creative Product Field from the Perspective of Knowledge Graph

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**Abstract.** The aim of this work is to visually sort out the current status and hotspots of museum research in China, summarise the current development dilemmas, and analyse the future development trends through knowledge graph. The method is to use CiteSpace literature data visualisation software and select CNKI database to analyse the knowledge graph of domestic academic papers in related fields during 2012-2023. The 10 most frequent research themes, 10 hot focus areas and 3 research development stages were summarised. Keyword clustering, keyword emergence and other maps are generated. The result is that the annual number of domestic papers published tends to be stable; the research history of the museum cultural and creative field is divided into the research start-up stage, the high-speed development stage and the digital application stage; culture, design strategy, marketing and digital cultural and creative are the more popular research areas; according to the research hotspots and keyword highlights, it is predicted that optimising the business environment, building intellectual property rights, new media communication and marketing, cultural and confident design and digital cultural and creative design will be the future research focus in this field. According to the research hotspots and keywords, it is predicted that optimising the business environment, building intellectual property rights, new media communication and marketing, cultural confidence design and digital cultural and creative design will be the focus of future research in this field. The conclusion is that the study sums up the development stage of domestic museum cultural and creative products, explores the future development direction of this field, and provides ideas and references for subsequent scholars to study the design of domestic museum cultural and creative products.

**Keywords:** Domestic Museum Cultural Creation; CiteSpace; Cultural Creation Products; Development Trend.

## 1 Introduction

The social significance of museums is becoming more and more prominent with the continuous growth of domestic economy, the improvement of people's living standards, and the expanding spiritual and cultural needs of people. As one of the important ways of cultural dissemination of museums, cultural and creative products have at-

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tracted the attention of the general public, and their development modes have also shown a spurt, with new modes emerging in an endless stream<sup>[1]</sup>. However, some museums rely too much on selling imitations of cultural relics to attract attention, there is a lack of innovative products, and there is still a lot of room for improvement in the combination of creative symbols and physical carriers. As the unity of cultural attributes and essential attributes of commodities, the unique cultural creativity of museum cultural and creative products has become the key to enhance the added value of products and market competitiveness<sup>[2]</sup>. Therefore, it is particularly urgent to study the field of museum cultural and creative products in depth, and to find effective ways to improve the level of cultural and creative product design and the direction of innovation by analysing the themes and trends of museum cultural and creative research.

## **2 Data Source and Research Method**

### **2.1 Data Sources**

This paper mainly focuses on the literature data in the CNKI database of China Knowledge Network (CNKI) as samples, and focuses on the relevant literature on cultural and creative products of museums that has been published in China. The keywords "museum cultural creativity" or "museum cultural creative products" are used as keywords. The article "Innovation, Development and Win-Win - Approaching the Cultural Products of the National Museum of China" published by Honglin Li, Mingwei Jiang and Ming Yang in 2012 is the earliest document included in the Knowledge Network under the conditions of keyword search, so the data from 2012 to 2023 are chosen. Therefore, the data of 2012-2023 is selected. The search date is set to 31 December 2023, and the journal sources are all journals, and a total of 1433 documents are retrieved. In order to ensure the accuracy of data collection, articles and materials with incomplete literature information and irrelevant to the research topic were manually excluded, and 1276 pieces of valid data were obtained.

### **2.2 Research Tool Selection**

CiteSpace is a scientific literature and knowledge graph visualisation software developed by Prof. Chaomei Chen based on Java language, which can analyse and explore the overall status of research results in a certain field as well as the hotspots and frontiers of the field<sup>[3]</sup>. The software is capable of visualising and analysing the literature and clustering the research hotspots in the field to determine the development trend of the field, which is suitable for the research needs of this paper<sup>[4]</sup>.

### **2.3 Research Methodology**

In this paper, With the help of CiteSpace6.5 R4 and the metrological analysis tool that comes with China Knowledge, this paper adopts the information visualisation analysis

method, takes the knowledge graph analysis as the main way, and takes the museum cultural and creative products as the object to draw the visual map of the research dynamics of the museum cultural and creative research, and further discusses the future development trend of the cultural and creative field of the museum.

### 3 Statistical Analysis of Research Literature in the Field of Museum Creative Design in China

#### 3.1 Graphical Analysis of the Number of Papers

The number of publications can reflect the progress and importance of the field in the academic world<sup>[5]</sup>. The number of publications on museum cultural and creative design in the Knowledge Network is shown in Figure 1, which was first included in 2012. The overall trend of the number of publications in this field of research is increasing, and the number of publications declined after 2020. The research in this field can be divided into three phases: 2012-2014, the number of articles published in this phase is relatively small, with no more than five articles per year. Early for the museum cultural and creative research is in the beginning stage, the scholars are mainly museum research librarians, for the development of museums in their region to discuss. 2015-2020, the growth rate of literature published in the high growth trend. The third stage is 2021-2023, and the chart shows that the number of studies has gradually levelled off in the past three years. In summary, the study found that the surge and decline in the number of museum literature research is more related to the release of national policies.

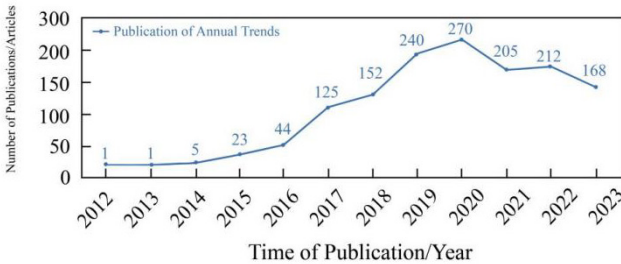


Fig. 1. Statistical chart of the annual posting volume of museum literature and creativity.

#### 3.2 Distribution of Research Journals

Table 1. Journal sources and publications.

Ranking	Journal title	Number of published papers
1	Identification and appreciation of cultural	119
2	relics	52
3	Cultural industry	47

Popular literature and art

4	Packaging engineering	41
5	Design	37
6	Chinese museum	30
7	Art education research	28
8	Modern and ancient literary creation	28
9	Art and Design (Theory)	25
10	China National Expo	24

Analysing the sources of literature journals by combing through them is conducive to clarifying the development trend in the field of museum cultural and creative products, discovering new research hotspots on the basis of previous research, and at the same time, helping to present the research results<sup>[6]</sup>. Table 1 shows the top ten publications in the field of museum cultural and creative products, and the CNKI database shows that the largest number of articles is "Cultural Relics Appraisal and Appreciation", with 119 articles, followed by "Cultural Industry", "Popular Literature and Art", "Packaging Engineering", "Design", etc. These publications are the best way to understand the domestic museum cultural and creative products in China, and they are also the best way to understand the domestic museum cultural and creative products in China. These journals are important channels to understand the research and development in the field of domestic museum culture and creativity. Among the top ten journals, six of them are core journals, which indicates that this field is published in more high-quality journals, and the papers are of good quality and have certain research value.

### 3.3 Research Institutions Mapping Analysis

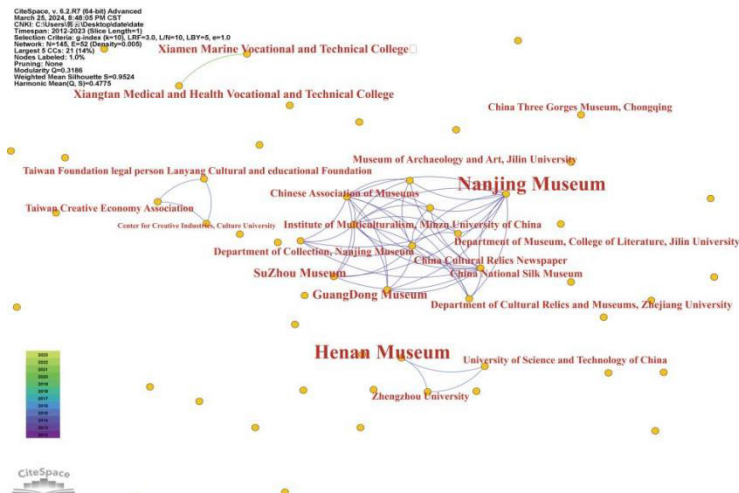


Fig. 2. Collaboration mapping of research institutes in the field of museum creativity

**Table 2.** Frequency of research by research organisations

Serial number	Research institution	Frequency
1	Palace Museum	10
2	College of Home and Industrial Design, Nanjing Forestry University	9 8
3	School of Art and Design, Nanjing Forestry University	8
4	School of Media and Film, Jiangsu Normal University	8
5	School of Journalism and Communication, Hunan Normal University	8
6	Nanjing Museum	6
7	Henan Museum	6
8	Guangdong University of Technology	5
9	National Museum of China	5
10	Shanghai Museum	5

The analysis of the co-occurrence of research institution collaborations provides an overall picture of the distribution of research efforts in the field. Using Time Slicing time slicing, slicing 1 year for the data, setting the Node Types parameter as Institution, the analysis generates a network knowledge graph consisting of 145 nodes of co-operative institutions with a Density of 0.005, the larger the node, the more important the institution is in the field of museum culture and creative industries. Table 2 shows the top ten institutions in terms of the number of published articles. Currently, research in the field of museum cultural and creative products is mainly carried out by local museums, museums and higher education institutions. Among them, local museums are represented by the Palace Museum, Nanjing Museum and Henan Museum. The institutions of higher learning are represented by Nanjing Forestry University, Jiangsu Normal University, Hunan Normal University and Guangdong University of Technology.

The density and coarseness of the links between institutions indicate the degree of co-operation between institutions<sup>[7]</sup>. As shown in Figure 2, the co-occurrence mapping of research institutions shows a total of 145 nodes and 52 links. Universities with a relatively high number of publications conduct research around museums in their regions, but the cultural and creative teams of domestic museums do not have close connections with universities, so this leads to a relative dispersion of research node associations. And some small and medium-sized museums have fewer nodes scattered due to difficulties such as fewer collection resources, lack of professional research talents, and shortage of R&D funds, resulting in less cooperation and communication with other institutions<sup>[8]</sup>.

### 3.4 Institutional Collaborator Mapping Analysis



Fig. 3. Mapping of author partnerships in the field of museum creativity

The Author Collaboration Graph is a graph depicting micro-collaborative relationships between authors. The size of the nodes reflects the number of articles published by the authors, larger nodes indicate more citations and influence, and the lines between authors represent the cooperation relationship between authors. Using CiteSpace, setting the Node Types parameter to Author, selecting the COA-Coauthorship Network command under the Analytics menu, and setting Time Slicing to 1 year, we obtained a visual co-occurrence of author cooperation and citation with the number of nodes 197, the number of links 112, and the density 0.0058. mapping, see Figure 3.

At present, the research on cultural and creative products in museums forms a decentralized group, and the ones that are closely connected mostly collaborate with teams from universities of the same institution. Yan Simin from Southwest University for Nationalities used Kano model and joint analysis method to analyse the cultural and creative products<sup>[9]</sup>; Yao Yi from Northeast Forestry University analysed the significance of cultural and creative products to the sustainability of museums<sup>[10]</sup>; and Wang Cailian from Wuhan University of Science and Technology explored the "re-generation" innovation design of cultural derivatives in museums<sup>[11]</sup>. Lv Jun, Shi Jixiang, Yan Jianqiang and An Laishun conducted written discussions through the 2014 International Museum Day activities, forming a denser node segment. Unlike universities, researchers in museum institutions collaborate in a dispersed manner, hence the more dispersed nodal line segments.

## 4 Research Themes and Hotspots in the Field of Domestic Museum Cultural Creativity

### 4.1 Keyword Mapping Analysis

Keyword is usually a summary of the topic in the literature, keyword analysis of the literature can be from the side to grasp the focus of the research in the field at various stages. In this paper, the literature from 2012 to 2023 is partitioned by year, the parameter of Node Types is set as Keyword, and the LLR algorithm is chosen to analyse the keyword co-occurrence knowledge graph with the number of nodes as 210, the number of connecting lines as 565, and the Density as 0.0257, as shown in Fig. 4. Each circle represents a node of the keyword, and the larger the circle is, the higher the frequency of the node, indicating that the node is in the field of the research focus at each stage of the research. Each circle in the graph represents a node of the keyword, and the larger the circle is, the higher the frequency of the node, indicating that the node has received extensive attention in the subject area. Combined with Figure 4 and Table 3, the node of "museum" is the largest, which indicates that "museum" appears more frequently in the literature, and is more important and influential in the research.

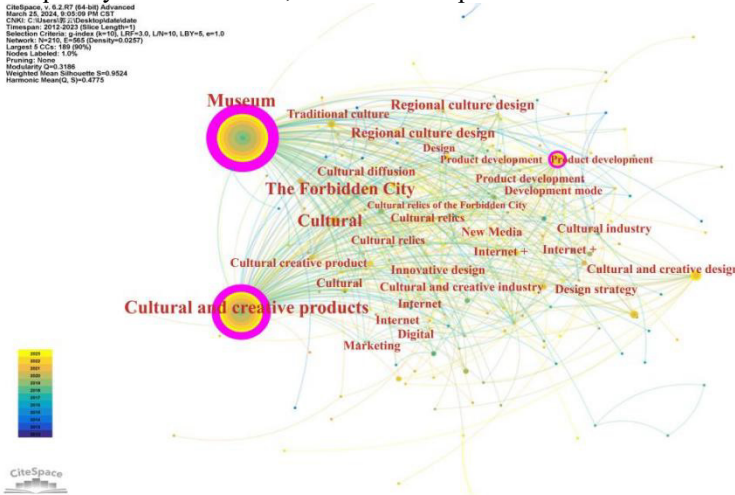


Fig. 4. Cultural and creative design

Table 3. Frequency statistics of keywords

Serial Number	Keyword	Frequency	A Given Year
1	Museum	519	2014
2	Cultural And Creative Products	435	2013
3	Cultural And Creative	86	2017
4	Cultural And Creative Design	44	2018
5	Exploit	41	2013

6	Design	37	2014
7	New Media	29	2016
8	Cultural Creativity	27	2016
9	Cultural And Creative Industry	26	2017
10	Traditional Culture	25	2017

## 4.2 Keyword Theme Cluster Analysis

The research hotspots are reflected by mining keywords, which, as the condensed embodiment of the article's theme and research content, can directly demonstrate the core of the article. In this study, we use the clustering module in CiteSpace software to analyse the keyword clustering map in the research field of cultural and creative products in museums, set the parameter of Node Types as Keyword, select the LLR algorithm, and click Label clusters with indexing terms to iteratively analyse the keyword thematic clustering map, which is shown in Fig. 5. The main indicators used to assess the degree of modularity of the network are Q value (Modularity) and S value (Silhouette), where the higher the Q and S values, the better the clustering effect of the network. When the Q value is greater than 0.3, it indicates that the clustering structure is significant; whereas an S value greater than 0.5 is generally considered reasonable, and an S value greater than 0.7 implies that the clustering is convincing<sup>[12]</sup>. In Figure 5, Q=0.3624; S=0.7196 indicates that this clustering view is significant and reasonable.

The keyword clustering of "museum cultural and creative products" forms nine clusters. The higher its intermediary centrality, the more important role the node has in the information transfer process; the identifier represents the key hot words appearing in the cluster. From the figure, it can be seen that the Internet, cultural creativity and cultural and creative design; countermeasures, design strategies, and the Forbidden City form two closely linked clusters in turn. Combining the literature, keyword co-occurrence results and keyword clustering results, the research themes of cultural and creative design in museums are categorised into the following three stages of thematic knowledge domains.



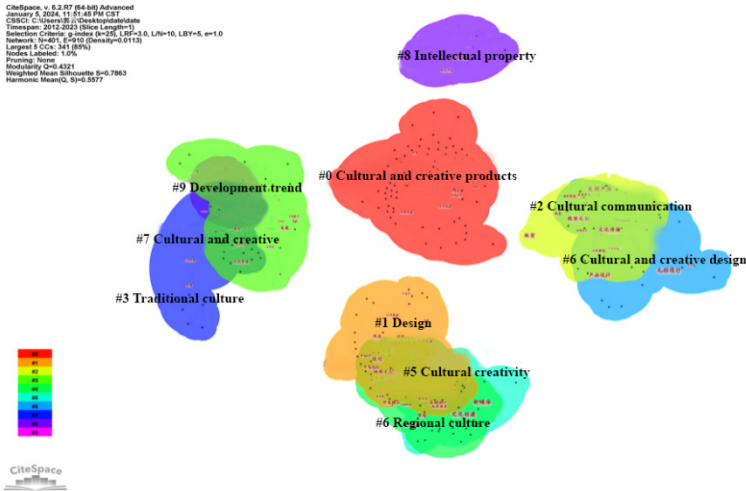


Fig. 5. Visualisation of keyword clustering in the field of museum literacy

### *Analysis of the Current Situation of Cultural and Creative Products in Museums*

The keyword clusters of the knowledge domain for this theme are cultural and creative products, cultural and creative, intellectual property and development trends. Their cluster sizes are 82, 34, 11, and 7. Museums are a type of institution whose mission is to collect, protect and study human cultural heritage, and whose essence is to find cultural commonalities in the course of human history and civilisation. Starting from the aspect of improving the social and educational effectiveness of museums, Ellie proposed that museums should strengthen the communication and cooperation between them and the education sector to make up for the problem of underutilisation of educational resources<sup>[13]</sup>. Li Boya, on the other hand, focuses on the three different levels of "information"- "knowledge"- "culture", and takes the museum as a position to highlight its cultural output function. In addition, it highlights its cultural output function<sup>[14]</sup>. While giving full play to the educational function of museums, cultural and creative products as the physical manifestation of cultural dissemination have also attracted the attention of scholars. Lou Bing conducted a theoretical study on the development of cultural and creative products, proposing that the theory of cultural capital, the theory of public cultural services, the theory of public products and the theory of concentric circles provide theoretical support for the development of cultural and creative practices<sup>[15]</sup>. Lian Kai analysed the Nanjing Museum based on the Jiangsu Museum Store Alliance, to create a "cultural and creative brand" to promote the development of cultural industries in cities, counties and museums business ideas<sup>[16]</sup>. Through the comparative analysis of the R&D capability of large museums and small and medium-sized museums, Wu Liang et al. introduced the intellectual property protection and authorisation of cultural creation involved in the R&D path of cultural and creative products, and proposed that the protection of intellectual property rights is the guarantee for the promotion of the R&D of cultural and creative products<sup>[17]</sup>.

### ***Design Methods for Museum Cultural and Creative Products***

The keywords clustered in the knowledge domain of this theme are design, regional culture and traditional culture. Their cluster sizes are 49, 33 and 20, respectively. By integrating and summarising the cultural resources stocked by museums, integrating traditional and local cultural elements to further enhance the reputation and image of museums, this is the main direction and strategy that museums are currently focusing on to develop cultural and creative products. Zhou Meiyu et al. analysed the application of humanistic design method in the field of cultural and creative product design by analysing the literature of museum cultural and creative design<sup>[18]</sup>. Wang Lu studied Hubei Provincial Museum's cultural and creative products based on tourists' sensory experience and found that most of the current best-selling products are mainly visual stimulation products<sup>[19]</sup>. Qiu Yu proposes that starting from the exhibits of museums, researching the cultural connotation and regional cultural characteristics behind the museum artefacts is the way to build a cultural and creative brand<sup>[20]</sup>. The branding of museum creations has become a trend, and large museums such as the Palace Museum, the Nanjing Museum and the Shanghai Museum have already been in the forefront. Yi Ping proposed that the core of the museum creative industry lies in innovation, and the premise of innovation is based on culture, therefore, when emphasising the creativity of the products, the cultural heritage of the museum creative products themselves should not be ignored<sup>[21]</sup>.

### ***Cultural and Creative Development in the Context of Digitalisation***

The keywords clustered in the knowledge domain of this theme are cultural communication, cultural creativity and cultural design. Their cluster sizes are 34, 32 and 30, respectively. Along with the changes in media communication methods, museums' cultural and creative industries are provided with brand-new communication channels and tools. The high degree of interactivity of new media enables museums to better meet the needs of potential consumers in the marketing process and quickly adjust creative design concepts and marketing methods<sup>[22]</sup>. Wang Xiang proposes to design and analyse products and conduct detailed and in-depth research on the needs of different groups of people, which will also improve the success rate of product development<sup>[23]</sup>. Wu Zhiyong et al. found that the main communication mode of local museums in the past was limited to "basic display + publications + lectures", and local museums in the new media era have gradually formed a new communication mode of "online + offline"<sup>[24]</sup>. Jidong et al. analysed the method of content marketing of Shandong Museum's cultural creation with short video as a carrier, and put forward the four aspects of short video operation: user first, content guidance, value enhancement and channel dependence<sup>[25]</sup>. Yu Yan et al. around the "Zibo barbecue" brought about by the city traffic changes, analysed the Zibo museum to cope with this incidental event, by strengthening the passenger flow management, complete media matrix and enrich the mode of cultural and creative products<sup>[26]</sup>. The innovation of digital technology has also brought about changes in the design of cultural and creative products. Taking the Shanghai Museum as an example, Hu Xuwen proposed that with the rapid technological advancement and the constant updating of VR, AR and MR technologies, the development of cultural and

creative products should connect the audience with culture through the forms of technological enhancement and Internet super-connection<sup>[27]</sup>. Because the immersive sensory experience can make the museum's cultural relics more easily accepted and remembered, which also provides ideas for the current problems encountered in the development of cultural creativity in museums.

### 4.3 Keyword Hotspot Prominence

The distribution of emergent words reflects the citation intensity of keywords related to the research field, as well as the starting and ending years with the highest citation intensity, and due to the fluctuation of word frequency, it can reflect the development trend of the research field, research hotspots and the development trend of the research frontiers to a certain extent. In CiteSpace, set the Node Types parameter as Keyword, choose Burstness in Control Panel panel to set the  $\zeta (0, 1)$  to 0.7, and Minimum Duration to 1 year, click View to get the 15 keywords of the emergent knowledge map, and analyse the emergence of the keywords, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence, the greater the intensity of emergence. The greater the intensity of emergence, the higher the research intensity in this phase, as shown in Figure 6. The word "culture" is in the first place with a burst intensity of 3.08, followed by "design strategy" and "marketing". This is also the keyword that is more concentrated in the research hotspots up to now. Based on the starting and ending time of the emergent keywords, the author divides the development of cultural creativity in museums into the following three stages.

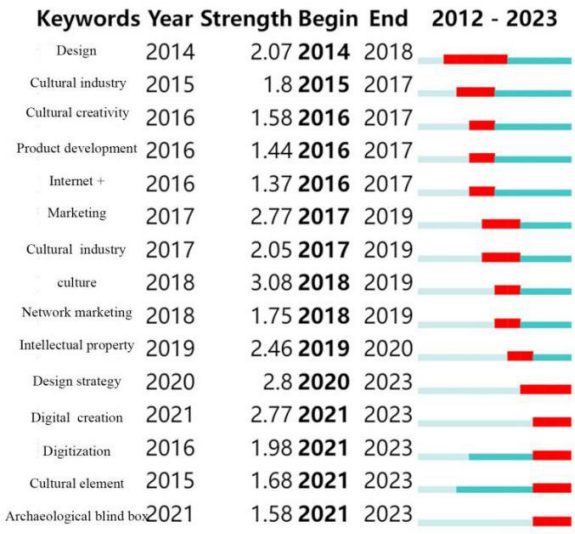


Fig. 6. List of keywords highlighted in the field of museum creativity

### ***Research Initiation Stage***

The initial phase of research began to emerge between 2014 and 2017. In 2014, the Southeast Forum invited experts in the field of museums to conduct a written discussion on the theme of International Museum Day, "Museum Collections Build Bridges of Communication". In March 2015, the first national regulation on museums, the Museum Regulation, was released. In 2016, the General Office of the Ministry of Culture and Tourism and the State Administration of Cultural Heritage released policies related to the development of cultural and creative products in cultural and heritage units, and museums have entered the era of cultural and creative operations. "Design" is the most prominent keyword at this stage, which confirms that scholars at this stage mainly focus on the design and development of cultural creative products in museums.

### ***High-speed Development Stage***

The rapid development stage began to emerge from 2018 to 2020. "Culture" is the keyword with high intensity in this phase, with an intensity of 3.08, which indicates that a large number of scholars in this phase mainly focus on culture as the theme for the study of museum cultural creativity. Zhang Ziqing explains the reasons why viewers are attracted to cultural relics programmes from the programme content and audience evaluation data, which leads to the interpretation of Chinese culture in the process of cultural creation design<sup>[28]</sup>. From the perspective of cultural self-confidence, Wang Yuyao suggests that the effective use of cultural creations to tell the story of cultural relics is the key to promoting the culture of museums and cities<sup>[29]</sup>. Through analysing and learning from the advanced experience of developed countries in the United Kingdom and the United States, Nie Hongtao and others put forward the suggestions of clarifying the property rights of original collections and cultural and creative products on the basis of the confirmation contract, and setting up the internal intellectual property rights management institution of museums<sup>[30]</sup>. There are not many successful cases that can be compared with the Palace Museum in China, and the successful model of the Palace Museum is difficult to be copied in other museums<sup>[31]</sup>. On the whole, scholars at this stage have researched around the marketing strategy as well as the design direction of large museums in the context of cultural self-confidence, and explored the intellectual property issues arising.

### ***Digital Application Stage***

The digital application phase will begin to emerge between 2021 and 2023, with "digital creativity" being the keyword with the highest intensity of 2.77. "Digital creativity" is the keyword with a high intensity of 2.77. The production and dissemination of cultural and creative content has also undergone revolutionary changes since the digital era. From the beginning of the physical display of cultural relics to the current VR/AR virtual display with the venue as the carrier, it breaks the technical barriers between cultural communication and digital environment, and makes a significant innovation to the traditional display of cultural relics and the development of cultural creative products. Jiang Ningwen discusses the advantages of

the new media to connect life and cultural creativity in the context of "Internet +"<sup>[32]</sup>. Luo Min proposes that to make good use of digital technology to develop museum cultural and creative products is the premise of the integration of museum cultural resources, each regional museum represents the local history and cultural flavour, different development concepts and sources of exhibits will give the museum a completely different look<sup>[33]</sup>. Yuan Lin analyses the application scenarios of AIGC technology in the design of museum cultural and creative products and predicts its possible impact, which opens up a new direction for cultural relics to "come alive"<sup>[34]</sup>. On the whole, scholars at this stage are thinking about how to use digital technology to carry out innovative design of museum cultural creation, seeking further development and innovation of museum cultural resources.

## 5 Research Conclusions

### 5.1 Firm Cultural Self-confidence is the Foundation for the Development of Cultural and Creative Industries

Cultural self-confidence is the most fundamental, profound and enduring driving force for the development of a country and a nation. Chinese civilisation is one of the only civilisations in the world that has lasted forever, and has created many dazzling cultural achievements. In the keyword highlighting map, "culture" has the highest highlighting intensity and the hottest research trend, which fully reflects the importance of cultural inheritance by researchers of museums and cultural creativity. In the new era, museums must also give full play to their role in exploring cultural connotations with their collections. Marketing" in the atlas is also the focus of scholars' research, revealing that museums should make good use of marketing means in the new media era to tell China's story through cultural exhibits, so as to make museums become an important position for the promotion of excellent traditional Chinese culture. Taking the National Palace Museum, the museum most studied by scholars, as an example, cultural and creative products such as the Three Palaces and Six Courts refrigerator stickers, Linglong Fuyun necklaces, and White Crane and Purple Sky note pads sell well for no other reason than that they are boldly innovated on the basis of maintaining the characteristics of the original cultural relics and become more practical and diversified. So that the Palace culture into the consumer's daily life in the necessary objects, usually lying in the exhibition hall of cultural relics "live up", so that both the dissemination of traditional culture, but also enhance people's cultural self-confidence. It can be seen that cultivating the seeds of cultural self-confidence is the potential goal of the development of cultural creation in museums, and firm cultural self-confidence is the basis for the development of cultural creation industry.

### 5.2 Intellectual Property Protection is a Prerequisite for Stimulating the Innovation Vitality of Cultural and Creative Products

Innovation is the first driving force leading development, and the protection of intellectual property rights has become a key part of protecting innovation. China's muse-

um cultural and creative industry is now showing a trend of rapid development, especially in the field of creation of cultural and creative products, intellectual property rights not only builds an important foundation for the cultural and creative industry, but also maintains its healthy development. The term "intellectual property" shows a relatively high intensity of 2.46 in the mapping of research hotspots. Since 2019, there has been a gradual increase in research on intellectual property rights in the field of museum culture and creativity. Shan Jixiang, former president of the Palace Museum, said in an interview that from 2011 to 2019, there were about 58 cases of infringement in the Palace Museum<sup>[35]</sup>. It can be seen that adequate intellectual property protection is needed for the museum creative industry in order for the domestic market to maintain a stable and positive development trend. Under such circumstances, creators will put their creativity and ideas into practice, thus promoting the innovation and quality of cultural and creative products. The protection of intellectual property rights is not only an important endeavour for the benefit of society, but through strict protection of intellectual property rights, the consumer market can also be purified and the rights and interests of consumers protected.

### **5.3 Dissemination of China's Voice is the Direction for the Future Development of the Museum's Cultural and Creative Industry**

Chinese culture is the soul of the Chinese nation. Promoting Chinese culture and expanding the power and influence of communication focuses on improving the effect of communication. Museums' cultural creations are a business card for displaying Chinese excellent traditional culture, and they should do a good job of positive publicity to increase public attention and cultural infectiousness. Under the support of the background of "Internet+", it has become a phenomenon for cultural and creative products to go overseas through online sales platforms. According to the statistics of Tmall Taobao's overseas platform, the museum's cultural and creative products are among the "top ten most popular New Year's products among foreign consumers". The unique oriental elements in Chinese museum cultural and creative works have attracted more and more foreigners to learn and explore Chinese culture, and this kind of cultural and creative works with strong national tendency and practical characteristics has become a brand. It has become a brand that encourages Chinese culture to go global, and the effective "cross-border" cooperation between China's outstanding cultural and creative brands and well-known intellectual property rights at home and abroad has improved the mode of digital selection to explain and promote Chinese culture to the public<sup>[36]</sup>.

### **5.4 Digital Innovation Will Promote High-Quality Development of Cultural and Creative Products**

Nowadays, digital technology is at the forefront of the global technological revolution and industrial transformation. With a salience value of 2.77, "digital culture and creativity" is one of the hottest research hotspots. How to give full play to the driving leadership of information technology and digitalisation to promote the construction of

digital China is the main theme of the development of cultural and creative industries. The "Nine-Coloured Deer" series of cultural and creative works is Gansu Provincial Museum's attempt to design the familiar image of the nine-coloured deer. By integrating the contexts of "Bodhi has no tree" and "Spiritual Deer", the museum has successfully created immersive cultural and creative products through the contextual interaction of "Spiritual Deer and Nature"<sup>[37]</sup>. This technological innovation not only brings the audience a more interactive and immersive visiting experience, but also expands the forms and media of cultural and creative products, greatly enhancing their attractiveness and influence<sup>[38]</sup>. In recent years, the rapid development of generative artificial intelligence (AIGC) has brought new opportunities for designers in AI image generation, AI literary creation, etc. Applying AI technology to the design of museums' cultural and creative products brings more diversified and up-to-date experiences to the audience. It can be foreseen that AI technology is bound to be the new direction for the development of museum creative development in the future. Wang Xiaohui and others use AI image generation technology to carry out algorithmic cultural and creative design with the artistic style of Eight Broken Pictures<sup>[39]</sup>. Digital technology also provides a convenient channel for the digital protection of cultural relics, virtual exhibitions, and online education. In the future, it is necessary to further strengthen technological empowerment, make use of meta-universe, virtual reality, augmented reality, mixed reality, as well as blockchain, big data, cloud computing and artificial intelligence, to build a civilisation dissemination system that is fundamental to the construction of content, supported by advanced technology, and safeguarded by innovative management, to grasp the audience's mindset, to highlight the immersive experience, and to make the Chinese civilisation more tangible and palpable.

## 6 Conclusion

In this paper, through CiteSpace, the mainstream software for visual analysis of academic literature, we chose CNKI academic database that contains Chinese journal articles, and mapped 1433 related scientific research literature during 12 years, and the author divided the development trajectory of the field of cultural and creative products in museums into three time phases, and refined four key conclusions through the keyword clustering and hotspot highlighting results, the data conclusions and clustering results meet the requirements of software accuracy and have certain theoretical reference value. Firstly, the focus of the research in the beginning stage is centred on cultural confidence. From the perspective of the function and cultural inheritance of museums, this argument makes it clear that the cultural creation of museums must be down-to-earth, and based on the use of rich collection resources, it should tap into the connotation of excellent culture to better display Chinese culture to the world. At the stage of high-speed development, for the creation of cultural and creative products, intellectual property rights are an important foundation for the construction of the cultural and creative industry, and also a key element to stimulate the innovation vitality of cultural and creative products and promote market competition. Therefore, paying attention to the protection of intellectual property rights is also an im-

portant measure to promote the museum's cultural and creative industry to a faster and better development. In the digital application stage, the development of digital technology provides a wider creative space for the design of cultural and creative products, and digitalisation will promote the high-quality development of cultural and creative products.

In the current context, the rise of cultural and creative industries in museums is not only an inevitable phenomenon, but also a result of the mutual promotion of national policy support and market economy. In the deep ploughing of scholars, the research in the field of museum cultural and creative products has already constituted a certain theoretical system, but there is still a need for breakthroughs in four aspects: product rethinking based on the perspective of cultural self-confidence, optimising the mechanism of operation and development and establishment of intellectual property rights, reinforcing the dissemination of Chinese museum culture, and stimulating the vitality of product innovation through the use of digital technology. In the future, the museum creative industry will face more new opportunities and challenges. Under the leadership of digital innovation, more forward-looking and innovative cultural and creative products can be expected to emerge. We hope that this article can help researchers of cultural and creative products to understand the current situation of domestic research and provide some ideas and insights for their design research.

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