

Research on the Design of Sanxingdui Cultural and Creative Products Based on Artificial Intelligence Technology

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doi:10.56397/AS.2023.12.02

Abstract

The research aims to explore the design of cultural and creative products related to the Sanxingdui culture from the perspective of artificial intelligence (AI) technology. This study considers the significance of integrating AI technology into the design process of cultural and creative products, with a focus on the Sanxingdui culture. By examining existing cases of cultural and creative products, the research identifies principles and methods for designing AI-based products that reflect the essence and uniqueness of the Sanxingdui culture. The findings of this study can contribute to the development of innovative and interactive cultural and creative products that bridge the gap between traditional culture and modern technology.

Keywords: Sanxingdui culture, artificial intelligence, cultural and creative products, design, research

1. Introduction

Sanxingdui Civilization, located in Guanghan City, Deyang, Sichuan Province, China, has gained worldwide fame since it was officially discovered in the late 1920s and early 1930s. Guanghan Sanxingdui is a key cultural relic protection unit in China. It is an ancient city, ancient country and ancient Shu cultural site with the largest scope, longest duration and richest cultural connotation found in Southwest China. It is known as one of the greatest archaeological discoveries of mankind in the 20th century and the “source of Yangtze River civilization”. With the rapid development of modern Internet technology, AI technology has risen rapidly (LIU Rui, 2023).

Society and academia generally believe that the rapid development of artificial intelligence technology provides new possibilities for the inheritance and protection of Sanxingdui culture. By integrating artificial intelligence technology with Sanxingdui culture, unique and attractive cultural and creative products can be created, so that people can better understand and experience the charm of Sanxingdui culture.

In the design of cultural and creative products, the importance of Sanxingdui culture cannot be ignored. As an outstanding representative of ancient Chinese civilization, Sanxingdui culture contains rich symbolic meaning and artistic characteristics, and its unique patterns, murals and artifacts have become valuable resources in the design of cultural and creative products. However, the traditional way of cultural display has been unable to fully meet the needs of modern people, and people’s understanding and appreciation of culture have also changed. Therefore, the development of artificial intelligence technology provides the public with a new way of cultural exchange and display, so that Sanxingdui culture can be presented to the audience in a more vivid and interactive

way.

2. Definition of Relevant Concepts

2.1 Introduction to Sanxingdui Civilization

Sanxingdui civilization refers to an ancient civilization found at the Sanxingdui Site in Guanghan City, Sichuan Province, China. According to information released by the Ministry of Culture and Tourism of the People's Republic of China, the Sanxingdui civilization originated between about 1200 BC and about 1100 BC and is considered to be one of the important stages in the development of prehistoric culture in China. The site of Sanxingdui civilization is located in the Chengdu-Chongqing Plain in the middle reaches of the Yangtze River Basin, which has important historical value and cultural heritage.

According to the book *Sanxingdui: The Mysterious World of the Late Neolithic Age* (by Yang Hongzhi, China Social Sciences Press), the emergence of Sanxingdui civilization is closely related to Hongshan culture. Hongshan Culture is one of the branches of Chinese prehistoric culture, which flourished from about 1900 BC to about 1300 BC, mainly distributed in southwest China. Sanxingdui civilization is a branch of Hongshan culture, formed and developed on the basis of Hongshan culture.

According to the Sanxingdui Museum's exhibition materials and archaeological findings, the Sanxingdui Site is a huge urban site, covering an area of about 48,000 square meters. A large number of artifacts and remains have been found in the site, such as bronzes, jades, pottery, stone tools, altars, Mayan pyramids, etc. Among the most famous finds are a large number of mysterious bronze wood engravings of human faces and bronze skulls decorated with sun and fire patterns.

These unique cultural relics and relics reflect the unique characteristics and religious beliefs of Sanxingdui civilization. According to the explanation provided by the Sanxingdui Museum, the Sanxingdui civilization may be related to the belief in the worship of monsters in the ancient Bashu region (Zhao Hongju, 2023). The patterns and symbols on the bronze face and the bronze skull show the worship and sacrificial activities of the ancient people to the mysterious power.

2.2 Definition of Artificial Intelligence

Artificial Intelligence (AI) is a subfield of computer science that seeks to research and develop technologies and systems to simulate, extend, and extend human intelligence. According to the White Paper on the Development of Artificial Intelligence in China (2018) released by the Ministry of Industry and Information Technology, PRC, artificial intelligence is defined as "a science and technology that uses computer technology to simulate, extend and extend human intelligence."

According to official information, the core concept of artificial intelligence is to let computers have the thinking ability of perception, understanding, learning, reasoning, judgment and decision-making, so that they can imitate human intelligent behavior and achieve a certain degree of autonomy. Through the use of big data and analytical algorithms, artificial intelligence enables computers to extract useful information from complex data, conduct autonomous learning and adapt to environmental changes, quickly process complex problems and make decisions (Li Zhenhua, 2023).

In the sub-field of artificial intelligence, Machine Learning is one of the most critical technologies. According to official sources, machine learning is an important branch of artificial intelligence, whose goal is to learn and improve by making computers learn from data, rather than strictly explicit programming instructions. This learning process allows the computer to adjust its behavior based on experience and data and continuously optimize its performance.

Another concept closely related to artificial intelligence is Natural Language Processing (NLP). According to the National Natural Language Processing Development Plan (2021-2030), natural language processing is an important component of artificial intelligence, with the goal of enabling computers to understand and interpret human language. Through natural language processing technology, AI is capable of text analysis, machine translation, sentiment analysis and other tasks.

3. The Significance of Innovating Sanxingdui Cultural and Creative Product Design with the Help of Artificial Intelligence Technology

At present, with the increasing development of Internet technology, artificial intelligence technology has also ushered in new development opportunities, and began to play a role in the field of cultural industry. For Sanxingdui Museum, using artificial intelligence technology to innovate the design of Sanxingdui cultural and creative products is an inevitable trend of the progress of The Times, which can not only be conducive to the publicity and promotion of Sanxingdui culture, but also promote the public to better understand Sanxingdui Museum and Sanxingdui culture, and play a positive role in improving the research and development level of museum cultural and creative products in China. This will help inherit and carry forward the fine cultural

tradition of the Chinese nation and promote the prosperity and development of China's cultural and creative industries.

3.1 Is Conducive to the Publicity and Promotion of Sanxingdui Culture

With the progress of science and technology, the Sanxingdui civilization site is constantly being mined, which once again amazes the world. By using artificial intelligence technology, virtual reality experiences related to Sanxingdui culture can be created, such as using augmented reality technology to present Sanxingdui cultural relics to the audience in the form of three-dimensional models. This immersive experience will attract more people to pay attention to and understand Sanxingdui culture and increase its popularity at home and abroad. In addition, artificial intelligence can also use speech recognition and natural language processing technology to provide personalized and interactive guided Tours for viewers, enabling them to have a deeper understanding of the historical background and characteristics of Sanxingdui culture.

3.2 It Will Help the Public Better Understand Sanxingdui Museum and Sanxingdui Culture

With the increasing popularity of Sanxingdui civilization at home and abroad, people's attention to Sanxingdui civilization is also increasing. By combining AI technology and display methods, Sanxingdui Museum can create a more vivid and interactive exhibition. For example, artificial intelligence technology can be used to realize the intelligent display and interpretation of cultural relics, so that the audience can more intuitively observe and understand the characteristics and historical background of cultural relics. Meanwhile, AI can also provide visitors with personalized visit suggestions through data analysis and recommendation algorithms to help them better plan their trips and explore the treasures of Sanxingdui Museum in depth.

3.3 It Is Conducive to Improving the Research and Development Level of Cultural and Creative Products in Chinese Museums

Artificial intelligence has unique advantages in product design and creative generation, which can assist designers in image design, color matching and other aspects of creative work. At the same time, artificial intelligence can also provide museums with the basis for market research and product planning through big data analysis and market trend prediction, and improve the research and development accuracy and market adaptability of cultural and creative products. Through the introduction of artificial intelligence technology, it can promote the innovative development of China's museum cultural and creative industry and improve its competitiveness in the international cultural and creative market.

4. Application Principles of Artificial Intelligence Technology in the Design of Cultural and Creative Products of Sanxingdui Museum

In the modern era of digital economy, artificial intelligence technology has become an important force to promote social progress. In the cultural and creative industry, artificial intelligence technology is also playing an increasingly important role. Artificial intelligence technology has an important application prospect in the design of cultural and creative products of Sanxingdui Museum. At the same time, the development of cultural and creative products related to Sanxingdui culture with the help of artificial intelligence technology is also an extremely challenging field, because innovation and design need to be carried out on the basis of respecting history and culture to attract more tourists and audiences. The continuous development of artificial intelligence technology has brought new opportunities and possibilities to this field.

4.1 Principle of Interactivity

Interactivity is the primary consideration of artificial intelligence technology in the design of cultural and creative products. In the design of cultural and creative products of Sanxingdui Museum, interactivity is mainly reflected in enhancing the experience of visitors. Through voice interaction, gesture recognition and other technologies, visitors can interact with the exhibits, thereby obtaining a more in-depth visit experience. For example, visitors can control the display of the exhibits by voice or gesture, and even experience the charm of Sanxingdui culture through virtual reality technology. This interactivity not only enhances the visitor experience, but also makes cultural and creative products more attractive and unique. For example, design a cultural robot interpreter, and set up a variety of language explanation mode (Mandarin and local dialects), a variety of foreign language explanation mode. It can help foreigners, the elderly and children to better experience the mysterious charm of Sanxingdui culture during the tour.

4.2 Practical Principles

The practical principle is the principle that artificial intelligence technology must follow in the design of cultural and creative products. In the design of cultural and creative products of Sanxingdui Museum, practicality is mainly reflected in improving the use value and efficiency of products. For example, through artificial intelligence technology, cultural and creative products can make intelligent recommendations and personalized services according to the needs and preferences of visitors, improving the satisfaction of visitors. In addition,

artificial intelligence technology can also improve the service life and reliability of cultural and creative products, reduce maintenance costs, and make products more competitive in the market. For example, cultural and creative products can help people to recognize and understand Sanxingdui culture at the same time, with daily practical use functions, and Sanxingdui culture-related cultural and creative digital toys, digital games, digital projectors, digital e-books, digital cups, etc. For the lovers of Sanxingdui culture, to provide more practical souvenirs, thus narrowing the distance between consumers, more conducive to the spread of Sanxingdui culture.

4.3 Principles of Data Intelligence

Data intelligence is another important principle of artificial intelligence technology in cultural and creative product design. In the design of cultural and creative products of Sanxingdui Museum, data intelligence is mainly reflected in the collection and analysis of visitor behavior data. Through the collection and analysis of visitors' behavioral data, such as visit routes, stay time, purchase preferences, etc., visitors' needs and behavioral habits can be deeply understood, thus providing strong support for the design and marketing of cultural and creative products. For example, based on the results of data analysis, designers can adjust the layout of exhibits, optimize the appearance and function of products, and improve visitors' satisfaction and purchase intention. In addition, data intelligence can also provide decision support for the operation and management of museums, such as dynamically adjusting opening hours and optimizing the distribution of people. According to the data analysis results, the types of cultural and creative products can be more accurately developed, and the market positioning of Sanxingdui cultural and creative products can be more accurately realized.

5. Application Measures of Artificial Intelligence Technology in the Design of Sanxingdui Cultural and Creative Products

5.1 The Inevitability of Applying Artificial Intelligence in Cultural and Creative Design of Sanxingdui Museum

With the rapid development of science and technology, the advanced technology of artificial intelligence has been widely used in various fields. With its unique advantages, it has played a pivotal role in many industries. Especially in the design of cultural and creative products of Sanxingdui culture, the introduction of artificial intelligence technology will inject new vitality into this ancient civilization.

Sanxingdui culture, as an important part of Chinese civilization, has a long history and unique charm. However, due to its long history and geographical restrictions, the general public has limited knowledge about it. Cultural and creative products are the bridge connecting Sanxingdui culture and the public. Through creative design, more people can appreciate the charm of this culture (Qi Qi, 2023).

Artificial intelligence technology, with its powerful computing power and deep learning ability, provides unlimited possibilities for cultural and creative product design. Designers can use artificial intelligence technology to dig deeply into the elements of Sanxingdui culture and extract its unique artistic features and cultural connotations. At the same time, artificial intelligence technology can also accurately grasp market demand and consumer preferences through big data analysis, and provide more targeted creative direction for cultural and creative product design.

In the realization process, artificial intelligence technology can work closely with professional designers to jointly complete the design of cultural and creative products. Designers provide creative inspiration and artistic control, while AI technology provides technical support and data analysis. This mode of cooperation will give full play to the advantages of both and realize the perfect combination of technology and art.

Through the introduction of artificial intelligence technology, cultural and creative product design will be more efficient, accurate and creative. At the same time, this will also inject new vitality into the inheritance and development of Sanxingdui culture, so that more people can appreciate the charm of this ancient civilization.

5.2 Application of Artificial Intelligence in Information Integration and Analysis of Cultural and Creative Product Design

Sanxingdui Museum can use artificial intelligence technology to integrate and analyze a large amount of cultural heritage information in order to better understand the characteristics and connotation of Sanxingdui culture. Through artificial intelligence algorithms such as data mining and pattern recognition, the hidden laws and trends can be found, providing strong support and guidance for cultural and creative product design.

Sanxingdui Museum utilizes advanced artificial intelligence technology to accurately integrate and analyze a large amount of cultural heritage information. By using efficient machine learning and natural language processing algorithms, artificial intelligence can automatically process and interpret massive data, thus revealing the characteristics and connotation of Sanxingdui culture in a more comprehensive way. This intelligent processing method can greatly improve work efficiency, reduce manual intervention errors, and provide more accurate data analysis and interpretation according to the needs of different fields.

Through artificial intelligence algorithms such as data mining and pattern recognition, Sanxingdui Museum can

discover the laws and trends hidden behind cultural heritage information. These algorithms can extract valuable information from a large amount of data and automate classification, induction and summary. This intelligent data processing method can provide strong support and guidance for cultural and creative product design, so that designers can more accurately grasp the market demand and consumer preferences, so as to create more in line with market demand and consumer preferences of cultural and creative products.

In addition, artificial intelligence technology can also provide more refined support for the design of cultural and creative products. For example, through machine learning and computer vision technology, designers can automatically analyze the appearance, structure and function of cultural and creative products, so as to more accurately grasp the design direction and details of the product. This intelligent processing method can greatly improve the design efficiency and quality, and can provide designers with more comprehensive and accurate design support and guidance.

Therefore, artificial intelligence technology has wide application prospects in the field of cultural heritage protection and cultural and creative product design. By adopting intelligent processing methods, Sanxingdui Museum can better understand the characteristics and connotation of Sanxingdui culture, discover the hidden laws and trends, and provide more accurate support and guidance for the design of cultural and creative products.

5.3 Application of Artificial Intelligence in the Creative Generation of Cultural and Creative Product Design

Sanxingdui culture has a rich art and symbol system that can stimulate the creativity of designers through artificial intelligence technology. Through technologies such as deep learning and generative adversarial networks, computers can simulate the creative process of humans and generate unique and artistic design schemes, bringing new possibilities to the design of cultural and creative products.

Sanxingdui culture, an ancient and mysterious existence, has a rich and diverse art and symbol system, which seems to tell the story of the past and arouse deep thought. These art and symbol systems not only have a deep historical background, but also are full of unlimited creativity, they can serve as an important source of inspiration for artificial intelligence technology, and stimulate the infinite creativity of designers.

Through cutting-edge artificial intelligence technologies such as deep learning and generative adversarial networks, we can enable computers to simulate the human creative process and generate unique and artistic designs. The application of this technology undoubtedly brings new possibilities for the design of cultural and creative products and opens a new future.

Specifically, these AI technologies can analyze various artistic elements and symbols of Sanxingdui culture, digging deep into its unique creativity and aesthetic value. They can then recombine and recreate these elements and symbols according to the needs and goals of the designer, producing a design that is both historic and modern.

These design schemes can be in various forms, such as flat patterns, three-dimensional modeling, and even dynamic images. Whether it is in the appearance design of the product or in the interior decoration design, these design schemes can be used for reference and application, so as to bring more diversified choices to consumers. For example, some home decorations with Sanxingdui cultural symbols can be designed, including cups, carpets, 3D printed decorative paintings and so on. For another example, we can give full play to artificial intelligence technology, develop some cultural and creative products related to the treasure of Sanxingdui Museum and town hall — bronze Dali Man, and design young people's favorite hand office, desk lamp, car decoration and so on with his image (Wang Liping & Zhou Liang, 2023). It can also combine the shapes and patterns of other cultural relics in Sanxingdui to design schoolbags, pencil cases and toys for primary school students, which can increase the practicability of cultural and creative products while widely spreading and popularizing Sanxingdui culture.

In general, through artificial intelligence technology, we can not only better understand and apply the art and symbol system of Sanxingdui culture, but also pass on these valuable cultural heritage, providing a steady stream of inspiration and creativity for the design of cultural and creative products in the future.

5.4 Application of Artificial Intelligence in Personalized Customization of Cultural and Creative Products

Everyone's understanding and preferences of culture may be different, so the personalized customization of a cultural and creative product is very important to meet the needs of consumers. Through artificial intelligence technology, users can be provided with personalized customized services for cultural and creative products based on their preferences and historical behavioral data. This can not only increase user satisfaction, but also increase sales and brand loyalty.

In this digital age, the continuous development of artificial intelligence technology makes personalized customized services more and more common. For cultural and creative products, personalized customization services can not only meet consumers' pursuit of uniqueness, but also help enterprises improve sales and brand

loyalty.

Through AI technology, Sanxingdui Museum can analyze users' preferences and historical behavior data to provide them with customized recommendation services for cultural and creative products. This personalized customized service can help enterprises better understand the needs and preferences of consumers, so as to provide them with more intimate products and services. On the other hand, Sanxingdui Museum also uses artificial intelligence technology to conduct more in-depth research and analysis of cultural relics. Through the application of high-definition photography, image recognition, deep learning and other technologies on cultural relics, experts at Sanxingdui Museum can more accurately identify the age, material, process and other information of cultural relics, and further explore the historical value and cultural connotation of cultural relics.

At the same time, Sanxingdui Museum is also actively using artificial intelligence technology to enhance the visitor experience. Through the combination of intelligent voice guide system and virtual reality technology, visitors can have a deeper understanding of the history and culture of Sanxingdui civilization and feel the charm of ancient civilization.

Sanxingdui Museum also uses big data technology to analyze visitors' behaviors and preferences to provide them with more personalized services and experiences. For example, for primary school students, kindergartens and other educational institutions, Sanxingdui Museum can use artificial intelligence technology to develop some suitable cultural and creative experience games, including online games and offline games, through these virtual cultural and creative game products, primary school students and kindergarten students can immerse in archaeology, excavation and other game activities. It can not only develop the hands-on and brain ability of children and primary school students, but also broaden their horizons and improve their cultural literacy.

For consumers, personalized customized services can enable them to obtain cultural and creative products that are more in line with their needs and improve purchase satisfaction. At the same time, this personalized customized service can also let consumers know more about the products and services of the enterprise, thus increasing the sense of trust and loyalty to the enterprise.

In addition, artificial intelligence technology can also help cultural and creative enterprises better manage inventory and supply chains. By analyzing sales data and market trends, companies can more accurately predict market demand and supply, so as to better plan production and inventory management. This can not only improve the operational efficiency of enterprises, but also reduce inventory overhang and waste.

The application of artificial intelligence technology in cultural and creative products can help enterprises better meet the needs of consumers and improve sales and brand loyalty (Chen Chucer, 2023). At the same time, this personalized customized service can also help enterprises better manage inventory and supply chain, improve operational efficiency and market competitiveness. In the future, with the continuous development of artificial intelligence technology, personalized customized services will play a more important role in the cultural and creative industry.

5.5 Application of Artificial Intelligence in Interactive Experience of Cultural and Creative Products

With the continuous progress of technology, people's requirements for interactive experience of cultural and creative products are getting higher and higher. Through artificial intelligence virtual reality and augmented reality technology, it can bring more real and immersive visiting experience to the audience. They can interact with cultural and creative products through virtual characters, feel the unique charm of Sanxingdui culture, and have a deep understanding of its history and cultural connotation. Through artificial intelligence's speech recognition and natural language processing technology, cultural and creative products can have a dialogue with the audience and provide them with more personalized and intelligent services. For example, the audience can ask questions to cultural products, ask various questions about Sanxingdui culture, and get detailed and accurate answers. Such an interactive experience can not only increase the audience's participation and interest, but also give them a deeper understanding of the unique charm and historical value of Sanxingdui culture.

Artificial intelligence technology can also bring more possibilities for the production and promotion of cultural and creative products. For example, through machine learning and data analysis technology, the audience's behavior and feedback can be analyzed, so as to provide more accurate strategies and programs for the production and promotion of cultural and creative products. For example, in response to the public's concern about Sanxingdui civilization, an online Sanxingdui museum can be established through artificial intelligence technology. Through virtual technologies such as VR, the real Sanxingdui Museum can be restored on the network, so that Internet users at home and abroad can realize long-distance immersive online tour of Sanxingdui Museum with the help of artificial intelligence technology.

Artificial intelligence technology can also be combined with other fields such as e-commerce to bring more opportunities and channels for the sales and promotion of cultural and creative products. For example, Sanxingdui Museum can strengthen cooperation with tableware companies to design cultural and creative

products such as tableware, alarm clocks, pet toys and other Sanxingdui elements for home use through artificial intelligence technology (Xu Yanzhang & Zhang Tiantian, 2023).

In addition, the introduction of artificial intelligence technology can also be combined with other fields such as e-commerce, bringing more opportunities and channels for the sales and promotion of cultural and creative products. Through close cooperation with tableware companies, Sanxingdui Museum can use artificial intelligence technology to design various cultural and creative products related to Sanxingdui elements, such as delicate tableware for home use, creative alarm clocks, and even pet toys. The design of these products is not only unique, but also can meet the individual needs of different consumers, so as to bring more possibilities for the development of cultural and creative industry.

Ai technology can provide powerful support in the design process, helping designers better understand consumer needs and market trends through technologies such as deep learning and data analysis. At the same time, artificial intelligence technology can also optimize and improve products according to consumer feedback and behavioral data, so that products are more in line with market demand and improve sales effect. Through the combination with the e-commerce field, the sales channels of cultural and creative products can be further expanded. The traditional physical store sales model is no longer the only choice, and online sales and online platforms have become more and more important sales channels. Artificial intelligence technology can help cultural and creative enterprises establish their own e-commerce platforms, and use intelligent recommendation and personalized marketing and other technologies to improve product exposure and sales. At the same time, artificial intelligence technology can also provide strong support for the production and inventory management of enterprises through data analysis and prediction, reduce operating costs, and improve the overall efficiency.

The introduction of artificial intelligence technology can bring more opportunities and challenges to the cultural and creative industry. By combining with e-commerce and other fields, cultural and creative enterprises can better meet the needs of consumers and market trends, expand sales channels, and improve brand influence. At the same time, artificial intelligence technology can also help enterprises reduce costs and improve efficiency, and inject new impetus into the sustainable development of the cultural and creative industry.

Therefore, artificial intelligence technology has brought more opportunities and challenges to the cultural and creative industry. Only through continuous technological innovation and application exploration can we meet the needs of the audience for a more authentic, immersive, personalized and intelligent visiting experience, and bring broader prospects and opportunities for the development of the cultural and creative industry.

6. Conclusion

In the context of the development and application of artificial intelligence technology, this study takes the design of Sanxingdui cultural and creative products as the theme, and explores the influence of artificial intelligence technology on the design of cultural and creative products. Through the in-depth study of Sanxingdui culture and the application of artificial intelligence technology, this study puts forward a series of forward-looking design schemes and technical applications.

First of all, through the excavation and analysis of Sanxingdui culture, this study deeply understands its unique historical value and cultural connotation. On this basis, we use artificial intelligence technology, combined with big data analysis and algorithm model, to achieve intelligent recognition and analysis of the shape, pattern and symbol of Sanxingdui cultural relics. This provides rich materials and inspiration for the design and creativity of cultural and creative products.

Secondly, this research also realizes the organic combination of Sanxingdui culture and modern design concept through the assisted design of artificial intelligence technology. Through the application of machine learning algorithms and generative adversarial networks, we can optimize the design of cultural and creative products, and improve the innovation and catering of products. At the same time, through the support of artificial intelligence algorithms, the personalized customization of products can be better realized to meet the needs of different users.

Finally, looking forward to the future development direction, this study believes that there is still great potential for the application of artificial intelligence technology in the field of cultural and creative product design. In the future, the integration of artificial intelligence and emerging technologies such as virtual reality and augmented reality can be further explored to enhance the immersive experience and interactivity of cultural and creative products. At the same time, it is necessary to strengthen the combination with cultural inheritance and protection to ensure that on the basis of respecting traditions, it ADAPTS to the needs of the development of The Times. It is hoped that the findings and experience of this study can provide references for the development of cultural and creative product design, and promote the application and innovation of artificial intelligence technology in the cultural industry.

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