

Design Strategies of Preserving Museum Cultural and Creative Products in the Era of AI+: Literature Review

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Abstract

As Artificial Intelligence (AI) technology continues to evolve, Chinese museums are increasingly adopting digitalization and networked systems. Visual aesthetics play a crucial role in enhancing cultural and creative products, while AI supports the development of interactive exhibition spaces and cultural artifacts. However, challenges persist, including repetitive narratives, a lack of originality in cultural products, and uneven digital progress across museums. This study explores the development and current trends in museum cultural and creative product design in the context of the Internet era. Leveraging the metaverse and AI-driven technologies can help Chinese museums establish unique intellectual property symbols and create immersive virtual experiences. AI generative design enables museums to produce innovative, personalized cultural products, enrich consumer sensory engagement, and bring cultural artifacts to life in three-dimensional forms. The Beijing Palace Museum serves as a prime example of integrating AI technology and strategic design approaches. By precisely targeting consumer preferences and incorporating elements of traditional Chinese culture, the museum blends practicality with creativity. Its focus on craftsmanship, combined with cross-industry collaboration and new media integration, ensures that its cultural products maintain their heritage value while achieving commercial success in the AI era. This paper emphasizes that the sustainable development of cultural and creative products is essential for the future of museums. Advancing the thoughtful design and innovation of these products in Chinese museums remains a critical subject today.

Keywords: Artificial Intelligence, Museum Cultural and Creative Products, Palace Museum Cultural, Traditional Culture

Introduction

Future generations will have access to a vast cultural treasure trove thanks to China's 5,000-year history and cultural legacy. China may offer a fresh perspective in the cultural market by creatively enhancing its superb traditional culture and employing traditional cultural

resources. Chinese museums should take advantage of the modern era's prospects, delve into the core of traditional Chinese culture, and make significant strides in the growth of the creative and cultural industries, given their significance as a repository for the preservation and transmission of Chinese culture.

A key path for China's social and cultural construction in the "AI+" era is the inventive development and imaginative transformation of its superb traditional culture. In addition to being a new design challenge to support the integration of science and technology with China's superb traditional culture, the digital design and development of museum cultural and creative products also fits to the new needs of the strategic development of the cultural and creative sector. New ideas like the metaverse and "Internet+" have emerged in response to the rapid growth of information technologies like artificial intelligence, big data, blockchain, cloud computing, and the Internet of Things. This has led to the emergence of numerous new types of technological integration.

The design form of museum culture and creative products has been opened by the introduction of virtual digital beings, generative design, digital asset, multimodal interaction, and immersive experience into consumers' visions (Liang, 2020). Products with creative qualities and cultural overtones are referred to as cultural and creative products. The main idea is to use goods as vehicles for developing China's wonderful traditional culture in new and inventive ways while also satisfying the spiritual demands of consumers. China's economy is growing quickly, and as a result, the nation is placing more value on the cultural sector. The State Administration of Cultural Heritage made the point that developing outstanding businesses with exemplary outcomes and building cultural and creative product development projects are essential, as is creating representative museum cultural and creative brands.

The creative and museum sector in China is seeing previously unheard-of growth prospects. The modern consumer is increasingly concerned with enhancing the visual appeal of goods and delving into the meaning of traditional Chinese culture. This article examines the ways in which China's rich and exceptional traditional culture can effectively foster the growth of the museum industry for culture and the arts. It also applies various cultural elements to the design strategy of cultural and artistic products, offering a priceless source of inspiration for the creation and design of China's cultural and artistic products.

Evolution of Cultural Product Design in Chinese Museums

Museums can better support themselves financially thanks to the booming cultural and creative sector, which is crucial for the long-term health of these institutions and for satisfying the spiritual and cultural demands of modern society. The museums will inevitably adapt to a changing environment is by promoting cultural products. This helps museums avoid financial challenges and improves their surrounds and operating conditions (Du & Zhang, 2016). The cultural and creative sector, being a new and developing enterprise, should think about the social and economic advantages of promoting traditional culture in addition to its stated goal of spreading that culture.

Museums face many obstacles on their path to survival in today's market, including limited resources, intense competition, and public pressure (Liu, 2003). The key to overcoming these obstacles is to think creatively. As a result of improvements in design, consumers place a

higher value on newly introduced products and services. As a result, people pay attention to novel products. Some academics have argued that cultural and inventive products have a dual purpose from a design standpoint: first, they satisfy people's needs for tangible and intangible services; second, they allow for the recreation and understanding of artistic works (Nechita, 2014). As a result, cultural and creative goods must be incorporated with contemporary social life rather than being mere reproductions of modern utensils and cold past. Cultural and creative product design should cater to contemporary lifestyles and prioritise the incorporation of cutting-edge science and technology to captivate audiences (Nechita, 2014). The Palace Museum's unique design, which incorporates aspects of Chinese culture with internet, digital, and new media technologies, has won the attention of many (Nechita, 2014). A cultural interaction space and online and offline consumer services are also necessary to build a new user experience, increase familiarity with the Forbidden City, and encourage the better transmission of traditional Chinese culture and inheritance.

Enhancing User Experience with Smart Creation Tools

China has seen a slow increase in the popularity of short video live streaming platforms, primarily Douyin and Kuaishou, in recent years. Museums are stepping beyond the typical time and space constraints by utilizing short video platforms. "Virtual museum tours" are now a common way to take tours. "Cultural and museum tours" have developed from "taking photos and checking in" to "cultural education" and "study tours," as professional understanding of culture and museums has steadily blended with explanations from popular science. Museums are currently offering their cultural relics knowledge popularization, historical allusion theater interpretation, and museum cultural and creative product sales to consumers in a more natural way by entering the live streaming rooms of Douyin, Kuaishou, and other platforms. By connecting with popular videos and identifying relevant subjects, museum short video marketing encourages visitors to take part in the production of museum-themed material, allowing visitors and museums to work together to create a bridge of creative development (Shu, 2017).

Emotional design has gained popularity as a fashion trend and helps the public absorb museum artwork more readily. In addition, for example, the Beijing Palace Museum launched the 'Yongzheng: Feeling So Cute' series of animated images (as shown in Figure 2-4), which is based on the 'Yongzheng Enjoying Pleasures' series and is accompanied by interesting text descriptions. Since its release, the number of clicks has far exceeded one million. The Palace Museum uses digital technology to show the charm of its collection of cultural relics. The picture has changed the previous majestic image of the emperor and designed it into a real dynamic character image, bringing endless fun to consumers.



Figure 1. Paper-carved lantern of Along the River During the Qingming Festival



Figure 2. "Let's be friends"



Figure 3. "Come in if you dare. Come out if you dare"

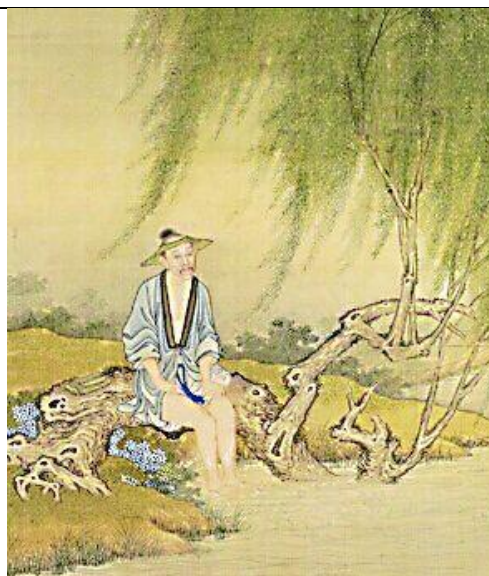


Figure 4. "My feet are itchy"

Excellent cultural and creative products are intrinsically linked to the cultural background with connotation at its core and are even more inseparable from the control of consumer psychology by visual aesthetics. Bold visual aesthetics are used in the design of museum cultural and creative items to bridge the gap between consumers and museum cultural treasures and draw in more target consumer groups. The meaning space of cultural and creative items is substantially expanded by the design of visual aesthetics, which is consistent with the individualized consumption needs of today's youth. While preserving the originality of the museum's collections, it also brings a redefinition of cultural relics in the era of artificial intelligence, allowing consumers to bring traditional culture home during their travels (Guo & Wang, 2024). The involvement of Chinese aesthetics in the design of museum cultural and creative products is an aesthetic demand for the diversified development of society in the era of artificial intelligence, providing a new path for design and development. The Internet provides a vast amount of information across circles, classes, and cultures for the new

generation of consumers, reconstructing the relationship between aesthetic objects (Chu, 2023).

Designers emphasize the value of product innovation, diversification, and personalization in the product development process to meet consumers' pursuit of aesthetic experience and diversity (Halabi, 2018). They also explore new technical means and creative thinking to meet the needs of various consumers and user terminal experience platforms. Consumers can select digital cultural and creative products that best suit their needs, aesthetic preferences, and the technical specifications of the terminal platform thanks to personalized and customized product design, which enables designers and users to achieve aesthetic fusion. This makes museum-quality cultural and creative products more useful and appealing while preserving the distinctive cultural qualities of cultural relics, better satisfying the aesthetic needs and expectations of users.

Promotes the Construction of Digital Cultural Relics and Interactive Exhibition Halls

In order to effectively engage with consumers, cultural and creative product design increasingly considers the consumer experience, using cultural and creative products as a vehicle for emotion during the experience process. Cultural and creative products from museums place a strong emphasis on consumer-centeredness, viewing design as an auxiliary to achieve emotional resonance between the two during the experience process. They also view consumers as a sensory complex that allows them to interact in multiple dimensions such as visual, auditory, tactile with the cultural and creative products. The experience of museum cultural and creative design is growing as artificial intelligence technologies like voice recognition and augmented reality boost cultural and creative product design (Yue & Guan, 2023).

Also, museum cultural and creative products lack personalized visual expression characteristics, they face a serious homogenization dilemma even though the elements and characteristics of the museum's collections were replicated in the initial design process thanks to the continuous updating of AIGC technology. China's museum culture and creative product design will follow the development trend of personalized customization, digital technological empowerment, cross-border cooperation, and the popularization and application of sustainable development in the era of artificial intelligence. It offers users a three-dimensional, varied, and modern immersive experience by utilizing innovative design and technology (Yu & Wu, 2022).

Using a combination of offline interactive devices and online augmented reality guides, Chinese museums have created digital and intelligent exhibits in recent years by fully utilizing new technologies. Artificial intelligence technology will be used to digitize and preserve three-dimensional models of cultural artifacts that are hard to preserve, lost in time, and only supported by historical materials and existing cultural artifacts. It will also enable information translation through the gathering of primary data. A highly engaging interactive museum has been built by combining AR technology with interactive gadgets to explore museum storytelling practice. Consumers can move their arms to interact with interactive gadgets in digital experience displays, overcoming the constraints of physical space and realizing the coexistence of people and virtual space.

Interactive products can create emotions by engaging users in meaningful, dynamic experiences that stimulate their senses and elicit emotional responses (Halabi, 2018). The authentic restoration and replication of history is the main goal of museum collections in digital form. Museum collections are more suited for storage, distribution, presentation, management, and operation thanks to digital processing technologies. Artificial intelligence technology, for instance, can be utilized to improve the management quality of museums using display layout and adjustments, as well as internal visitor flow statistics. Specifically, the online visit model makes it easier for consumers to comprehend and value cultural artifacts (Yu & Wu, 2023).

Design Study of Cultural Products at Beijing's Palace Museum

China's economy and society have both continued to grow in recent years, and the country's overall economic consumption level has also continued to rise. Consumer demand for spiritual culture has been growing, and as consumption has advanced, so too have consumers' expectations of aesthetics and cultural literacy. Museums are a vital tool for helping people comprehend the historical development backdrop and improve their cultural literacy since they serve as both a testimony to the evolution of human history and an integration of local cultural resources. A growing number of consumers are eager to visit museums in order to fulfill their spiritual needs. Chinese museums are evolving in the "AI+" era and developing and designing cultural and creative products is one of the best practices. In addition to fulfilling the museum's exhibition role, examining the cultural implications of its holdings, and ingeniously incorporating China's superb traditional cultural elements into every facet of visitors' lives also realizes the social purpose of public cultural education (Li & Wang & Li, 2022).

The development and design of cultural and creative products have continued to heat up, and museums all over the nation have ushered in a "cultural and creative era" as a result of China's policy of placing a high value on and supporting these industries. In summary, there is a noticeable difference in the standard of artistic and innovative product development and design between museums in different areas because of the limitations imposed by the museum's geographic reach, the caliber of its collections, and its marketing strategies. For example, compared with large museums such as the Palace Museum in Beijing and the Suzhou Museum, small and medium-sized museums are still in the initial exploration stage. Most cultural and creative product designs are of a single type and similar in form. The cultural elements they convey cannot accurately highlight their own characteristics, and it is difficult for them to stand out among many museums cultural and creative products (Fan, 2018).



Since he became the director of the Beijing Palace Museum in 2012, Shan Jixiang has opened a long-closed door for the forbidden city, allowing the top cultural relics and traditional Chinese culture that have been stored in the warehouse for a long time to go out of the deep palace and into the world in the form of cultural and creative products. Cultural and creative products such as "Beads Headphones" and "I miss you very much" produced by the Palace Museum have become an organic carrier of museum culture and have made great contributions to promoting my country's traditional culture (as shown in Figure 5 and 6).

In the era of "AI+", the Beijing Palace Museum has relied on the power of the Internet to carry out long-term cooperation with Tencent. Taking the stories and classic collections of the Forbidden City as prototypes, it actively explores the digital transformation of traditional culture and launches a series of games, mini-programs, and emoticons with Forbidden City elements. For example, apps such as "Daily Palace Museum" and "Night Banquet of Han Xizai" have spread symbolic elements with profound cultural heritage into consumers' lives through new media through the establishment of diversified scenes, realizing a cultural interactive experience with consumers as the center, and making the cultural IP image of the Forbidden City deeply rooted in the hearts of the people (as shown in Figure 7 and 8).



First, the Beijing Palace Museum's artistic and cultural offerings are largely successful because its target audience is well-positioned. The Palace Museum Taobao caters to younger consumers, the Palace Museum Mall serves a larger audience, the Palace Museum Cultural and Creative Museum serves both online and offline marketing, and the Palace Museum Cultural and Creative Flagship Store sells traditional products. These are the four online

business entities that the Beijing Palace Museum currently operates for cultural and creative products. In order to carry out precise and unambiguous design positioning for cultural and creative items, market research is conducted, online consumption ideas are gathered, and consumer needs are examined, depending on various target consumer groups.

The design of the Beijing Palace Museum's innovative and cultural goods reflects a trend toward diverse development, driven by consumer demand. The second is creative design that incorporates customary culture. The Beijing Palace Museum's design team blends contemporary creative expressions with China's exceptional traditional and rich collection resources to create unique design. For instance, the Palace Museum possesses about 10,000 items of apparel from the Qing Dynasty. It has evolved into the primary component of contemporary cultural and creative product design by removing patterns from these clothes patterns and locating visual symbols for redesign (Shu, 2017).

Thirdly, the design of museum-quality cultural and creative items is based on their practicality, with the goal of making them more accessible to the general public and possessing both cultural and practical value (Shan, 2014). The quest for craftsmanship comes in fourth. The cultural artifacts housed in the Beijing Palace Museum's collection are gems that have been meticulously crafted by artisans from many eras and have distinct cultural meanings and modeling qualities (Wang, 2019). Fifth, by leveraging digital machine technology for creative design, multimedia technological advancements in the age of "artificial intelligence+" offer new avenues for the digital distribution of collection resources. The Palace Museum's creative and cultural products are being developed and designed not only for physical markets but also for cross-border markets through the integration of new media and technologies. These developments will lead to the creation of virtual digital products and help shape the museum's cultural brand through increased consumer interaction (Wang, 2019).

Cultural Elements in Chinese Museum Product Design

With its lengthy history, rich legacy, and plenty of content, Chinese traditional culture offers a distinct edge when it comes to generating ideas for the creation of artistic and cultural goods. In addition to being a historical phenomenon that documents the course of history and the growth of human civilization, culture is also a social phenomenon that is produced by humans through extended social activity. The internal level of culture comprises tales, emotions, and culture, according to the three-level theory of culture. Three images such as regional cultural qualities, folk cultural characteristics, and collection resource characteristics are included in the cultural connotation of museum-produced cultural and creative goods. Consumer data surveys indicate that the majority of consumers consider the two most important components of cultural connotations to be geographical features and collection resource characteristics. Excellent traditional culture can be passed down and promoted, which will improve the qualities of creative and cultural product design and advance the growth of China's creative and cultural sector (Guo, 2022).

Regional Cultural Characteristics

Irreproducible habits, beliefs, aesthetic preferences, values, and historical developments that are particular to a country, area, or age are what define regional culture. Every location has unique, rich regional cultural traits of its own. In order to more clearly convey the distinctive style of the local area, the design of cultural and creative products must identify the most

typical elements from among a wide range of cultural symbols that can best reflect the characteristics of the area. Additionally, graphic language must be used to carry out visual design through design forms like induction, integration, reorganization, and arrangement (Shearmu, Carincazeaux & Doloreux, 2016). It is possible to effectively drive the construction of consumers' cultural identities and boost national cultural confidence by promoting the inheritance of regional culture through creative and cultural products.

Features of Traditional Culture

Chinese folk life is the foundation of folk culture. It is the folk culture that the great majority of consumers encounter, contribute to, and inherit throughout their lives. According to Tao Lifan, folklore can be categorized into four categories: spiritual folklore, which includes folklore performances, crafts, and rituals; language folklore, which includes myths and legends, proverbs, and ballads; and social folklore, which includes seasonal festivals, life etiquette, and commercial and industrial folklore. Various folk cultures from various countries, areas, and times reflect distinct cultural legacies. For example, in 2020, the Palace Museum's cultural and creative products launched an agate necklace for the upcoming Year of the Ox (as shown in Figure 9).

The design was inspired by Han Huang's "Five Oxen" in the collection of the Palace Museum (as shown in Figure 10). The designer used natural red agate as the main material, selected the image of the front ox to create, and designed the ox head into a semi-three-dimensional shape to highlight the round and cute ox cheeks. The back is in the form of a hollow coin, symbolizing the meaning of the lucky ox bringing wealth. This product not only conveys folk culture but also incorporates modern aesthetics, conveying rich cultural implications.



Figure 9. Agate Necklace



Figure 10. Han Huang's "Five Oxen"

Features of the Collection Resource

The vast collection materials found in China's big, medium, and small museums reflect the historical context and cultural traits of many eras and areas while also preserving the wonderful traditional culture of the country. The secret to working at a museum is thoroughly excavating them and reproducing the original historical appearance as accurately as possible. Cultural artifacts are the legacy of civilization, and in today's academic world, "bringing cultural relics to life" is a popular topic. In the "artificial intelligence+" era, when science, technology, and culture collide fiercely, museums, as the primary venue for showcasing and gathering cultural relics, should not only allow history to continue but also bring cultural relics "live" and integrate them into the lives of modern consumers in a more flexible and changeable way.

The Beijing Palace Museum has increased the marketing channels for cultural and creative products through a variety of channels, including e-commerce platforms and offline physical operations, in addition to promoting its products online and through new media. Its foundation is the traditional culture of the Palace Museum, from which it consistently creates rich derivatives, inherits Chinese traditional culture and live aesthetics, and demonstrates to nations all over the world the depth of Chinese culture (Liang, 2020).

AI's Impact on Cultural and Creative Product Design in Chinese Museums

The essence of traditional culture, the regional cultural features of China, and current cultural trends are all embodied in excellent cultural and creative product design. Through the integration of cultural aspects, it infuses new artistic aesthetic forms, gives consumers a distinct visual experience, and empowers them to build their cultural identity and acquire cultural confidence. Additionally, integrating traditional cultural components with the design of their cultural and creative products, Chinese museums currently confront the following challenges: First, traditional cultural aspects are used, but just superficially, with cultural connotations not fully understood. Second, the design of cultural and creative products lacks originality, and collection graphics and patterns are not redesigned.

Third, cultural and creative items have a less practical purpose, which makes it harder to connect emotionally with consumers. This paper examines the design strategies of museum cultural and creative products in the era of artificial intelligence in an effort to inspire the design of cultural and creative products for small and medium-sized museums in China, given the current state of cultural and creative product design in Chinese museums. The goal is to better meet the spiritual and cultural needs of consumers and promote the sustainable development of museum cultural and creative products (Liang, 2020).

Regional Culture to Extract Traditional Symbols for Unique Cultural Products

The fundamental components of aesthetics and the bearers of distinct cultural genes are the exterior characteristics of each museum collection, which include color, form, texture, pattern, and text. In order to blend tradition and modernity, designers must understand the historical, cultural background, and artistic value of cultural relics and incorporate them into the development and design of digital cultural and creative products. They also need to combine traditional cultural aesthetic elements with modern design concepts and blend the external features of products with their inherent historical and cultural connotations. Regional environments, Chinese history and civilization, and natural landscapes serve as the foundation for regional culture, which reflects the social structures of a region, including its politics, economy, and religion. Various regions have various cultures, each with unique traits impacted by elements including ethnicity, geography, and regional divisions.

In addition, a diverse range of lifestyles, artistic tastes, and cultural traditions combine to create a vibrant and complex regional cultural form. Creative and artistic products are designed with influence from their local cultures. Enhancing consumers' cultural confidence and pride can be accomplished through investigating local culture and drawing creative inspiration from it. Consumers are more likely to embrace and relate to the humanistic ideals found in particular historical contexts and cultural norms when it comes to museum-quality cultural and creative products (Chiou & Wang, 2017).

Product designers who are creative and cultural blend aesthetic sensibility with functionality, employ design as a medium, and organically incorporate cultural references into the prevailing lifestyle trend, enabling items to genuinely become a part of consumers' everyday lives. This is a significant trend in the evolution of creative and cultural output from museums as well. China is a multicultural nation. The creation of museum-quality cultural and creative products must be grounded in a particular regional culture, emphasize its distinctive features in the design process, and more effectively cater to the commemorative requirements of its target audience. The Forbidden City in Beijing, the largest surviving example of an ancient palace complex, is a cultural icon of China. The Beijing Palace Museum makes extensive use of architectural components in the creation of innovative and cultural goods. In 2018, the creation of artworks that portrayed the Forbidden City's historic architecture. The "Forbidden City Four Seasons" theme was used in the design of the phone case to convey to consumers the mood and creative vision of the Forbidden City architecture during various seasons (as shown in Figure 11).

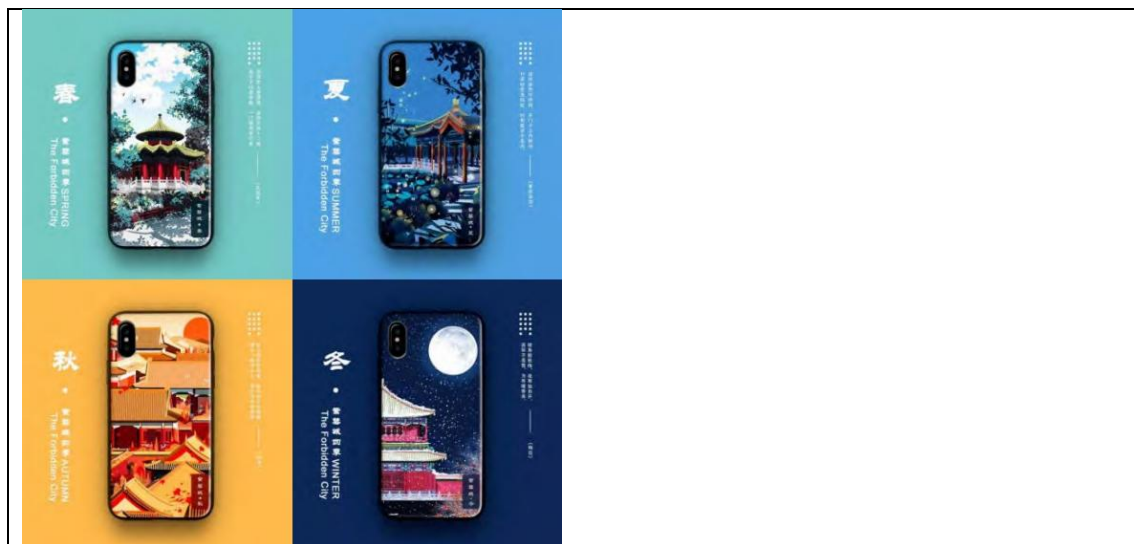


Figure 11. "Forbidden City Four Seasons" mobile phone case

Upholding Traditional Culture, Fostering Chinese Aesthetics, and Integrating and Developing Across Borders

In terms of spatial dimension, museum culture and creative objects have a flat and three-dimensional design. Elements are extracted differently depending on the product dimensions. Lines, patterns, and colors are represented in two dimensions, whereas shapes and materials are shown in three dimensions. In terms of design expression, two-dimensional patterns are typically more visually appealing than shapes. Beautiful and simple graphics can influence young consumers' purchasing decisions more than complex patterns. Three-dimensional cultural and creative product designs are typically single or full sets of handicrafts with very few variations. Three-dimensional design typically involves the deformation and reorganization of the shape of cultural relics, or abstraction into characters or stories for creative design, in order to integrate historical culture into the lives of consumers. In the spatial dimension of museum cultural creation, the use of appropriate materials can provide sensory satisfaction to visitors while also increasing the likelihood of their consumption behavior by expressing regional cultural features (Guo, 2022).

Traditional Chinese handicrafts have a rich history and are considered a treasure of Chinese culture. The artistic significance of traditional Chinese handicrafts is seen in the cultural artifacts gathered by global museums. They contain original ideas and ancient wisdom that have inspired a wide range of Chinese artistic creations. Designers should fully investigate the spiritual core of the Chinese nation's excellent traditional culture, find a way to integrate traditional ideas with modern design, inherit and perpetuate the excellent traditional culture, and realize the use of the past for the present when creating modern cultural and creative products. Emotions play a crucial role in attracting people to explore more, as they create a deeper connection and curiosity towards the product. Emotional attachment with the product is essential for fostering loyalty and long-term engagement, making the user experience more meaningful and memorable (Halabi & Hands, 2018).

In addition, Chu Sao, Zen, Taoist, and Confucian aesthetics all influenced the development of Chinese aesthetics. For thousands of years, the philosophical principles included within have greatly influenced the spiritual beliefs and lifestyles of the Chinese people. These ideas have also served as a major source of inspiration for the creation of modern cultural and creative products. In addition to being used to recreate history, museum relics' symbolic elements such as their shapes, lines, and details can also be creatively integrated into contemporary design by designers using contemporary design concepts and techniques.

They can also select materials, colors, and craftsmanship that complement cultural symbols to produce more distinctive and endearing modern cultural and creative products. For instance, to showcase the distinctiveness of Chinese culture and provide a joyous visual impact, designers typically employ representative colors like red, gold, and silver when creating artistic and cultural objects that represent Chinese traditional culture. In order for consumers to fully experience the spiritual connotation of China's excellent traditional culture, museum cultural and creative product design should be adept at condensing applicable traditional cultural elements from ancient cultural relics and profound culture and using cultural symbols with Chinese characteristics to create modern cultural and creative products (Guo, 2022).

Museum IPs Empowered by AI Technology Focus on User Experience to Enhance Product Appeal

In the age of artificial intelligence, the advancement of museum culture and innovative product design is inextricably linked to the backing of various technologies, like 5G, blockchain, cloud computing, AR, VR, MR, and others. For instance, the integration of AI, AR, 3D printing, and M-commerce also help in the fashion industry revolutionizes design, production, and retail, enabling personalized consumers experiences, efficient manufacturing processes, and seamless online shopping. This digital transformation enhances creativity, reduces waste, and increases accessibility, driving innovation and sustainability in fashion (Halabi et al., 2024). Consumers' virtual vision of the actual world is improved by augmented reality, virtual reality, and mixed reality technologies, which allow users to interact visually between virtual and real worlds. Together, the three technologies advance the metaverse's long-term growth. Within the realm of artificial intelligence, museums employ mixed reality MR technology to provide a virtual and realistic tour experience, while augmented reality AR technology is utilized to improve the physical venue's presentation.

Consumers can experience an exceptional museum tour from the comfort of their own homes without the need to travel. VR technology uses historical records and data assistance to realistically recreate damaged cultural relics, presenting a computer-restored 3D scene of cultural artifacts. MR technology facilitates the construction of virtual scenes that are interactive with the actual world and allows for the interaction of visitors with cultural artifacts shown in museums. Museums must make the most of their special advantages, choose emblematic cultural relics as distinctive IP pictures, and collaborate in the co-creation and development of IPs while utilizing artificial intelligence technologies. Through their own virtual creations of IP, consumers access the metaverse space of the collection IP and learn about the cultures and histories of various IPs.

A significant example of aesthetic intervention in the creation and design of digital cultural and creative goods from museum collections is the user experience (Halabi, 2018). The user experience and operational convenience of the product will impact the consumer's aesthetic experience in addition to their sensory enjoyment. A well-designed user experience will firmly hold the consumer's attention. Therefore, designers must take into account not only the product's internal cultural connotation and external aesthetic feeling when creating visual elements like appearance, color, shape, material, and graphics for cultural and creative products, but also the consumer's experience when using the product in an interactive manner. It is important to ensure the product can always maintain a sense of pleasure during use, enhance its own attractiveness, create a good aesthetic environment and experience for consumers, and realize the contemporary value of the museum's collection of cultural relics by thoroughly understanding and investigating the needs and living habits of the target consumers, as well as focusing on the characteristics of different consumer groups (Wang, 2019).

Promote Digital Construction and Build an Immersive Narrative Scene of Virtual Symbiosis

Museums are knowledge-based, open-air display spaces with a focus on cultural characteristics. To make cultural relics genuinely “alive” in the age of artificial intelligence, situations that sustain them must be restored. Cultural relics that are still in existence are taken out of their original historical contexts, and merely verbally describing them will not bring them back to life. Chinese museums are investigating how the gathering of cultural relic data might convert artifacts from data to information. The metaverse is a digitally generated virtual environment that exists outside of and is mapped onto the real world but can still communicate with it. It was created by people using technology. It serves as the digital home of a brand-new social structure. In addition, the creation of the metaverse offers a technological foundation for the restoration of cultural settings. Consumers can engage with actual space and have an immersive virtual experience with naked-eye 3D, holographic projection, wearable technology, and other methods.

Museums are able to finish the translation of cultural relics from “data-information-narrative” in the digital era, as well as restore the dynasties to which cultural relics belong and the historical context of their production in the metaverse. The immersive narrative scene of narrative symbiosis transcends time and location, enabling users to access the metaverse space at any time and from any location in order to comprehend the cultural meanings and stories underlying the artifacts, encourage the spread of China's excellent traditional culture, and widen the scope of humanities and history education.

Digital building is more than simply a tool for museums; it can also be used to help display cultural content and increase productivity. It is a constructive reaction to the new “Internet+” social structure and a prevailing tendency. Make the most of scientific and technological resources to convey the narrative of Chinese collections and raise the emotional significance of artistic and cultural goods. In order to promote Chinese culture, museum shows should blend actual and virtual forms, mixing text, graphics, music, images, and animation in an organic way. They should also use multimedia that is both pleasurable and logical. Cultural theory discourse is depicted in terms of expression thanks to the features of digital technology and new media communication (Chen, 2018).

The communication and influence of the product will be directly impacted by how it is designed and marketed to the target consumer groups for museum cultural and creative items. As artificial intelligence technology advances, customized design is becoming a crucial component of the creation of innovative and cultural goods for museum collections. In order to classify museum collections, designers must first analyze the interests and hobbies of their target audience based on their browsing history, purchase history, length of stay, and other behavioral data. They must also quickly create creative design models that cater to a variety of consumer needs and quickly design innovative and cultural products that satisfy consumers' aesthetic habits. Products may be made more visually appealing, consumer engagement can be directed, and user stickiness can be increased with the help of interactive games, virtual symbiosis exhibitions, beautiful promotional posters and movies, and exquisite cultural and creative product packaging (Chen, 2018). The goal of product promotion can be swiftly achieved by posting visually appealing promotional materials on social media platforms in order to precisely draw in potential consumers. This will also expand the consumer base for cultural and creative products and make it easier for them to swiftly and accurately enter the market. The use of artificial intelligence technology to process and analyze vast amounts of data related to cultural relics, extract useful knowledge and information, and implement functions like intelligent question and answer and personalized recommendations using natural language processing and other technologies. This eliminates the aesthetic differences between virtual and real space and improves the user experience for consumers by allowing them to interact with things that are more in line with their psychological needs and behavioral patterns.

Explore New Forms of Cultural Heritage Represented by Digital Collections

The traditional Chinese cultural business operates on a “producers-consumers” binary model, in which content is created by producers and passively accepted by consumers. Consumer participation in content creation increases as the barrier to entry for the Internet is dropped, and traditional content production evolves from a binary to a two-way interactive paradigm. With the aid of blockchain technology, China has rapidly expanded the digital collection NFT market in recent years, and the market is highly favorable to digital collections of intangible cultural heritage and cultural relics. Digital collections are a new frontier in the field of cultural creativity, bringing museum artifacts new life as a result of the ongoing development of the metaverse. The creation of cultural content is the essence of artistic and cultural products. The content value of cultural and creative products is guaranteed by the information traceability of NFT collections, which promotes the exchange of cultural and creative collections throughout the Metaverse. In order to add value to NFT collections, producers of

digital collections of cultural relics should be innovators who infuse modernity into their collections and apply creative thinking (Guo, 2022).

Conclusions and Recommendations

The integration of AI+ technologies in Chinese museums, particularly in the Beijing Palace Museum, offers significant opportunities to enhance visitor experiences and innovate cultural and creative product design. AI-driven personalisation and interactive elements can create tailored and immersive exhibitions that make historical artifacts more engaging and accessible. This approach bridges the gap between traditional heritage and modern technology, fostering a deeper connection with visitors and increasing engagement. Generative design tools and AI algorithms can lead to the creation of unique and personalized cultural products that blend traditional Chinese aesthetics with contemporary design elements. By analysing visitor data, AI can help museums develop customized experiences that cater to individual interests, making visits more meaningful and memorable. Additionally, the development of immersive virtual environments using metaverse technologies can allow visitors to explore cultural relics interactively, providing a dynamic way to experience history. Cross-disciplinary collaboration between AI experts, designers, and cultural historians is crucial to creating culturally rich and technologically advanced products. Museums should leverage new media platforms and digital marketing strategies to reach wider audiences and increase digital engagement. Real-time feedback systems powered by AI can continuously improve exhibits and products based on visitor experiences, ensuring that offerings remain relevant and engaging. Maintaining high standards of craftsmanship in AI-enhanced designs is essential to preserving the authenticity and quality of traditional Chinese culture. Educational programs that incorporate AI technologies can also foster a deeper appreciation and understanding of cultural heritage among visitors. Furthermore, sustainable practices should be prioritized to minimize environmental impact while maximizing cultural and educational value. In conclusion, by embracing AI+ technologies, the Beijing Palace Museum can promote the rational development and design of its cultural and creative products, ensuring they remain engaging, relevant, and commercially viable in the modern era. This approach not only enhances the cultural value of museum products but also supports the preservation and appreciation of Chinese cultural heritage.

References

- Chen, X. M. (2018). Research on the application of Chu cultural graphic symbols in the packaging design of cultural and creative products in Hubei museums. China: Guangxi Normal University. Retrieved from <https://d.wanfangdata.com.cn/thesis/D01507887>
- Chiou, S. C., Wang, Y. C. (2017) The Example Application of Genetic Algorithm for the Framework of Cultural and Creative Brand Design in Tamsui Historical Museum [J]. *Soft Computing*, 22(8): 2527-2545.
- Ying, C. (2023). "Division" and "integration": Intergenerational Differences And Changes In Youth Aesthetics, China: Chinese Youth Studies. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=117k0p40ms7m0000qq2n0rb0uk342727&site=xueshu_se
- Donaid, A N. (2015). Design Psychology 3: Emotional Design. (HE Xiaomei, OU Qiuxing, Trans.) china: CITIC press.
- Du, H.-M., & Zhang, S.-M. (2016). The cloud design system building research of tourist Souvenirs. *DEStech Trans. Eng. Technol. Res*, 8, 274–281.

- Jin, F. (2018). The current situation and development strategies of tourist souvenirs. China: Tourism Overview. Retrieved from [https://wenku.baidu.com/view/e42b23e501d8ce2f0066f5335a8102d277a261d8.html?_wks_=1720750059721&bdQuery=The current situation and development strategies of tourist souvenirs Fan Jin](https://wenku.baidu.com/view/e42b23e501d8ce2f0066f5335a8102d277a261d8.html?_wks_=1720750059721&bdQuery=The%20current%20situation%20and%20development%20strategies%20of%20tourist%20souvenirs%20Fan%20Jin)
- Mengqi, G., and Haiyan, W. (2023). Research on the innovative development strategy of digital museums under the background of the metaverse. China: Communication Research. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=1p750tr00u480me00d7f0tu0a3142393&site=xueshu_se
- Guo, X. H. (2022). Analysis on the current status and development strategies of museum cultural and creative products. China: Cultural Industry. Retrieved from <https://xueshu.baidu.com/usercenter/paper/show?paperid=1d0006t0nr4f0ve02r3t02r05h737781>
- Halabi, K. N. M. (2018). The impact of giftware design and its packaging attributes on consumer purchasing intentions behavior in the Malaysian context (Doctoral dissertation). Lancaster University, UK.
- Halabi, K. N. M. (2018). The Impact of giftware Design and Its Packaging Attributes on Consumer Purchasing Intentions Behaviour in Malaysian Context. Lancaster University.
- Halabi, K. N. M., & Hands, D. (2018). Identifying and Aligning Product ‘Attributes’ with Latent Consumer Purchase Motivations. *Asian Journal of Social Sciences and Management Studies*, 5(1), 16–22. <https://doi.org/10.20448/journal.500.2018.51.16.22>
- Halabi, K. N. M., Azahari, M. H., Goyal, S. B., Yusof, S. A. M., & Garg, R. (2024). Apply AI, AR, 3D Printing, and M-Commerce: Digital Transformation Case Study of Fashion Industry. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4502174>
- Kenya, H. (2011). Design in design. China: Peking University Press. https://xueshu.baidu.com/usercenter/paper/show?paperid=1j2j0p40yw7g02q097740ee09d537374&site=xueshu_se
- Hongchao, L., Xinyu, W., and Weiyu, L. (2022). Research on the design of cultural and creative products of the Palace Museum based on cultural elements. China: Packaging Engineering. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=1y1c0g90ba2t0xh08t6608s0m9037251&site=xueshu_se
- Shumin, L. (2020). Research on the development, design, and promotion of the cultural creation of the Beijing Palace Museum under the background of “Internet +” China: Packaging Engineering. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=1m5u0a105e5d0ee0vq7g06807f053580&site=xueshu_se
- Liu, Y. (2003). Engineering aesthetics and aesthetic ergonomics: theoretical foundations and a dual-process research methodology. *Ergonomics*, 46(13–14), 1273–1292.
- Nechita, F. (2014). The new concepts shaping the marketing communication strategies of museums. *Bulletin of the Transilvania University of Braşov, Series VII: Social Sciences and Law*, 1, 269–278.
- Jixiang, S. (2014). Dialectical thinking on the ten major relationships in the protection of the cultural heritage of the Forbidden City. *China Art News*. Retrieved from https://www.dpm.org.cn/research_talk/251936.html

- Shearmu, R., Carincazeaux, C., Doloreux, D. (2016). Cultural Creation and Social Innovation as the Basis for Building a Cohesive City [J]. Handbook on the Geographies of Innovation, 2016(10): 447-462.
- Xin, S. (2017). Research on the Expression of Graphic Symbols of Qing Dynasty Culture under the Background of "Internet+." China: Shenyang University. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=0be397c0afcf198ac73ed20dc0b4a72e&site=xueshu_se
- Zhao, W. (2019). Research on the redesign of China's excellent traditional cultural elements: Taking the design of cultural and creative products in Chinese museums as an example. China: Design. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=dcde50d3ecf819b00f9a0ef2c2e35a90&site=xueshu_se
- Meng, W. (2019). How the Palace Museum builds its brand. China: People's Daily Overseas Edition. Retrieved from <http://travel.people.com.cn/n1/2019/0301/c41570-30951268.html>
- Bingru, Y., Zihuan, W. (2022). Research on the development of digital cultural products of museum collections based on aesthetic intervention. China: Journal of Changsha Civil Affairs Vocational and Technical College.
- Yue, M., Guan, H. (2023). Make Cultural Relics "Alive" Research on the Application of Artificial Intelligence Technology in Museum Cultural Creation. China: Beauty and Times. Retrieved from https://xueshu.baidu.com/usercenter/paper/show?paperid=1u5e08h0fq7q04n06e4b0mm0q0769764&site=xueshu_se
- Zhao, Y. F. (2020). Theory and practice of cultural and creative product development in Chinese museums. China: Shandong Social Sciences.