*2025 International Conference on Art and Design, Education, Media and Social Sciences (DEMSS 2025)*

*Article*

# Research on the Current Application Status of Chinese Bronze Animal Patterns in Cultural and Creative Design

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**Abstract:** This research focuses on the current application status of Chinese bronze animal patterns in cultural and creative design. Firstly, it defines the concept as the decorative patterns centered on animals on the surface of bronze wares from the Xia, Shang, Zhou to the Qin and Han dynasties. Through stylized refinement, abstract deformation and symbolic expression, they carry religious beliefs, social hierarchy and aesthetic concepts, and are the core visual symbols of Chinese bronze culture. Currently, their cultural and creative applications have formed a pattern of "traditional carriers as the main body, digital carriers as the auxiliary, and practical functions as the orientation", accounting for 38% of the total sales of cultural and creative products in Chinese museums. They cover three scenarios: collection and decoration, daily use, and interactive experience, and the audience is significantly stratified. The cultural collection group prefers high-fidelity modeling cultural and creative products, the 18-35-year-old group favors cost-effective pattern extraction cultural and creative products, and children and teenagers tend to prefer interactive experience cultural and creative products. The specific application paths include: modeling replication type centered on the restoration of the original object, suitable for high-end collection; pattern extraction type that disassembles local visual elements and is suitable for various daily carriers, accounting for more than 60%, covering scenarios such as stationery, clothing, and home furnishings; and interactive experience type that relies on AR/VR technology to enhance the sense of participation. However, the industry development faces three bottlenecks: shallow cultural transformation, with 75% of products lacking interpretation of pattern connotations; innovation homogenization, with three types of elements such as the eyes of the beast face pattern accounting for more than 80%; and unbalanced resource allocation, with a technological resource gap between large museums and small and medium-sized institutions, and the market share of North China and East China accounting for 70%. Currently, the cultural and creative products of bronze animal patterns present the characteristics of "coexistence of scale growth and quality lag, coexistence of leading innovation and tail imitation". In the future, it is necessary to promote high-quality development through technological empowerment of cultural interpretation, IP operation to break homogenization, and regional coordination to narrow the gap.

**Keywords:** Chinese bronze animal patterns; cultural and creative design; current application status; application path; development bottleneck

## 1. Introduction

Currently, Chinese bronze animal patterns serve as a core cultural symbol in museum cultural and creative (CC) products, forming a stable development pattern characterized by "traditional carriers as the mainstay, digital carriers as supplements, and practical functionality as the orientation". According to the 2024 Report on the

Development of China's Museum Cultural and Creative Industry, CC products centered on such patterns account for 38% of total sales of museum CC products in China, fully addressing the three major user demand scenarios: collection and decoration, daily use, and interactive experience [1].

From the perspective of audience preferences, cultural collection enthusiasts tend to select CC products with high-fidelity modeling to satisfy their needs for commemoration and display. Individuals aged 18 to 35 show a stronger preference for pattern-extracted CC products with high cost performance, which are well suited for frequent daily activities such as office use and clothing. Children and adolescents exhibit the highest acceptance of interactive experience-based CC products, through which their cultural perception is enhanced via participatory design [2].

Regarding development stages, CC products featuring Chinese bronze animal patterns have achieved a key transition from "simple symbol replication" to "integration of cultural connotations and practical functions". However, the internal development of the industry reveals significant imbalances. Large-scale cultural and museum institutions, such as Henan Museum and The Palace Museum, have established mature full-chain systems encompassing "pattern extraction - design and development - marketing promotion" by leveraging resource advantages and accumulated technical capabilities. In contrast, small- and medium-sized museums, constrained by limited digital cultural relic resources and weaker design and technical teams, still primarily rely on the model of "mass replication of cultural relic symbols plus single carriers". Overall, the industry exhibits a development pattern of "leading at the top, following in the middle, and lagging at the bottom" [3].

## 2. Definition of the Concept of Chinese Bronze Animal Patterns

Chinese bronze animal patterns refer to decorative motifs centered on animals, including both real animals and imaginary mythical creatures, crafted by ancient Chinese artisans on the surfaces of bronze artifacts [4]. These patterns span the Xia, Shang, and Zhou dynasties through the Qin and Han dynasties (approximately the 21st century BCE - 220 CE) and constitute core visual symbols of Chinese bronze culture. Rather than merely replicating animal forms, these patterns transform animal imagery into visual carriers through processes such as "stylized refinement", "abstract transformation", and "symbolic expression". In this way, the patterns combine decorative functionality with rich cultural connotations, reflecting the religious beliefs, social structures, and aesthetic concepts of their respective historical periods [5].

Chronologically and spatially, the evolution of Chinese bronze animal patterns corresponds closely with the development of Chinese bronze ware. They first appeared during the Xia Dynasty, primarily as simple animal outlines, exemplified by early dragon motifs on Erlitou Culture bronzes. During the Shang Dynasty, these patterns reached their peak, with the establishment of core motifs such as beast-face patterns (taotie), dragon patterns, and owl patterns, which were intricate and imbued with a sense of mystery. In the Western Zhou Dynasty, the stylistic focus shifted toward regularity and vividness, with phoenix patterns and looking-back dragon patterns becoming dominant. The Spring and Autumn and Warring States periods were marked by diversification, with complex interlaced dragon patterns and coiled chi-dragon patterns emerging alongside realistic animal depictions such as deer and ox patterns. Following the Qin and Han dynasties, the widespread adoption of ironware led to a gradual decline in bronze ware production, and correspondingly, bronze animal patterns decreased in prominence [6]. Nevertheless, certain motifs, including dragon and phoenix patterns, were incorporated into other crafts such as jade ware and lacquerware, establishing themselves as enduring visual symbols within traditional Chinese culture. The main types of animal patterns and their associated symbolic meanings across different periods are summarized in Table 1.

**Table 1.** Types and Symbolic Meanings of Animal Patterns on Chinese Bronzes.

| Major Carrier Categories | Typical Artifacts | Pattern Types | Core Characteristics of Patterns | Symbolic Meaning / Functional Positioning | Typical Cases |
|---|---|---|---|---|---|
| Ritual Vessels | Ding, Zun, Jue, Gui | Mythical beast patterns (mainly including beast-face patterns, dragon patterns, and phoenix-bird patterns) | Large in size, with intricate details, symmetrical and regular in composition, and heavy in lines; some are paired with ground patterns such as thunder patterns and cloud patterns to enhance visual tension. | It symbolizes "divine protection" and "royal authority", reflects the social hierarchy of the users, and enhances the sanctity of sacrificial rituals. | The "Fu Hao Owl Zun" of the Shang Dynasty: Taking the owl as its vessel shape, it is entirely decorated with owl patterns, symbolizing Fu Hao's power and worship of the gods. |
| Weapons | Ge, Mao, Jian | Simplified mythical beast patterns (mainly dragon patterns and tiger patterns) | The patterns are highly simplified with redundant details removed; the lines are strong and forceful, with distinct edges and corners, matching the sharp form of weapons. | It emphasizes "valiant spirit" and "deterrence against enemies," which aligns with the practical combat functions and military symbolic significance of weapons. | The Shang Dynasty Dragon-patterned Ge: The body of the ge is decorated with simplified kui dragon patterns, featuring short and forceful lines without redundant decorations, which highlights the deterrent power of the weapon. |
| Food vessels and wine vessels | Pan, Dou, You, Gong | 1. Mythical beast patterns (animal-faced patterns, dragon patterns, and their simplified versions) 2. Realistic animal patterns (such as fish patterns, bird patterns, deer patterns, ox patterns, etc.) | The style is light and lively, with smooth and soft lines; the composition is moderately dense, avoiding overly complex patterns that might affect the use of the utensils; the realistic animal patterns are in a concrete form. | It meets the demand for "daily-life aesthetics", and some realistic patterns symbolize specific meanings. | The "Bird-patterned Bronze Pan" of the Western Zhou Dynasty: The edge of the pan is surrounded by continuous bird patterns with smooth, non-angular lines, which fits the daily use scenarios of food vessels. |

From a cultural perspective, animal patterns on Chinese bronzes are not merely decorative elements but "visual symbols" that carry multiple cultural functions. On a religious level, they serve as a medium for "communication between humans and deities," and the complexity and mystery of these patterns enhance the sanctity of sacrificial rituals. On a social level, they embody the "hierarchical order," where patterns of different types and complexities correspond to the social status of their users. On an aesthetic level, they reflect the aesthetic pursuit of "valuing spirit and charm over realism" during the pre-Qin period. Through the rigidity and softness of lines and the symmetry of compositions, they form diverse visual styles such as "solemnity and dignity" and "agility and elegance," laying a visual foundation for traditional Chinese art in later generations [7]. Animal patterns on Chinese bronzes are not only decorative motifs on bronze vessels but also important material evidence for studying the social culture, religious beliefs, and artistic aesthetics from the Xia, Shang, and Zhou dynasties to the Qin and Han dynasties. Their creative characteristics of "symbolization" and "stylization" have made them highly recognizable visual symbols in traditional Chinese culture, still providing important sources of inspiration for museum cultural and creative products and traditional art creations to this day [8].

## 3. Current Status of the Application of Bronze Animal Patterns in Cultural and Creative Design

### 3.1. Application of Shape Replication

The shape replication category represents a fundamental approach in the application of bronze animal patterns in cultural and creative products. Its core logic is based on "using the original bronze ware as a blueprint, extracting the overall shape characteristics of the animal patterns, and applying proportional scaling and material adaptation." This approach is primarily adopted in collection-oriented and decorative products. It emphasizes "morphological authenticity," enhancing users' intuitive understanding of bronze culture by faithfully restoring the core visual symbols of the artifacts [9].

For example, the "Miniature Fu Hao Owl Zun Ornament" from Henan Museum uses the Shang Dynasty Fu Hao Owl Zun as its design prototype, adhering to the principle of "high-precision replication of the cultural relic's form." The design preserves the owl-shaped outline of the original artifact, focusing on iconic features such as the "flat round head, round eyes, and hooked sharp beak" to ensure recognition of cultural symbols. The ornament is made of a bronze-colored alloy, which simulates the texture of ancient bronze through surface treatment, restoring the historical visual attributes of the relic. Its size is 1/5 of the original (approximately 10 cm in height), making it suitable for daily use scenarios such as desktop display and study decoration, achieving a balance between cultural restoration and practical placement [10].

Another example, the "Bronze Dragon-patterned Ding Ornament" from the Palace Museum, uses the Western Zhou Dragon-patterned Ding as the cultural carrier, with design focusing on "dual extraction of vessel shape and patterns." The "three-legged round belly" structure of the original ding is replicated to ensure historical accuracy, while 3D printing technology restores the relief texture of the "looking-back dragon patterns," recapturing the three-dimensional visual effect. To trace cultural origin, the bottom of the ornament is engraved with "Cultural and Creative Replica of Western Zhou Dragon-patterned Ding," clarifying the age and replica nature of the object, which strengthens cultural orientation and prevents misunderstandings about the historical context [11].

Market feedback shows that the primary consumers of shape-replica products are cultural collection enthusiasts and middle-aged and elderly groups. According to the 2024 Report on the Museum Cultural and Creative Industry, the repurchase rate of such products is approximately 25%. Users highly value "cultural fidelity" and "exquisite craftsmanship," but these products face limitations, including "limited practicality" and

"relatively high prices" (average 200-500 yuan), which hinder their appeal to younger consumers [12].

### 3.2. *Application of Pattern Extraction*

The pattern extraction category is currently the most widespread application approach. It involves "disassembling local visual units of bronze animal patterns, such as eyes of beast-faced patterns, scales of dragon patterns, and wings of phoenix patterns," and applying them to everyday carriers, achieving the integration of "cultural symbols + practical functions." This approach emphasizes "element adaptability," requiring adjustments in pattern complexity, color, and composition to suit the characteristics of the carrier. Based on the type of carrier, it can be divided into three main scenarios.

In stationery carriers, such as the "Beast-faced Pattern Notebook," elements like the "double eyes + horns" of Shang Dynasty beast-faced patterns are extracted. Simplified lines and single-color printing are applied to avoid visual interference during use. In the "Dragon Pattern Bookmark," the "S-shaped torso" of Western Zhou dragon patterns is extracted to form the outline of the bookmark, with smooth edges combining decorativeness and practicality [13].

For clothing and accessory carriers, such as the "Phoenix-bird Pattern Silk Scarf," the "spreading wings + cloud-like tail" of Spring and Autumn phoenix patterns are extracted. Low-saturation colors and continuous composition are used to maintain pattern integrity when the scarf is unfolded. For "Bronze Pattern Jewelry," owl pattern "round eyes" are transformed into pendant shapes, and silver-plated gold materials balance "ancient cultural aesthetics" with "modern fashion sense."

In home furnishing carriers, the "Beast-faced Pattern Cushion" uses the symmetric outline of the beast-faced pattern, realized through embroidery on linen fabric to enhance texture. The "Dragon Pattern Ceramic Cup" features simplified dragon scales printed on the outer cup, with a grayish green color suited to home décor styles. Pattern extraction products account for over 60% of museum cultural and creative product sales, with the primary audience being young consumers aged 18-35. Their core advantages include "affordable prices" (average 30-100 yuan) and "frequent use scenarios," although challenges remain in the "homogenization of element applications" [14].

### 3.3. *Applications of Interactive Experience*

With the advancement of digital technologies, interactive experiences have emerged as a new application approach. Through AR, VR, gamified design, and other means, users can engage with bronze animal patterns in a participatory way. Its core logic is "using technology to enhance user experience and strengthen emotional connections with culture." This approach emphasizes "experiential enjoyment" and is mainly applied in educational products and those targeting younger audiences.

For example, in AR applications like the "Bronze Pattern AR Coloring Book," users color line-drawn beast-faced and dragon patterns, which, when scanned, trigger 3D animations showing the original bronze forms along with voice explanations (e.g., "Beast-faced patterns were decorations on sacrificial vessels, symbolizing protection"). In gamified products like the "Bronze Pattern Jigsaw Puzzle Game," intertwined dragon patterns from the Spring and Autumn Period are modularized, and completion unlocks the evolutionary history of the patterns and related cultural relics [15].

Digital derivatives, such as "bronze animal pattern wallpapers," offer options in "traditional style" (restoring original colors) and "customized style" (allowing users to adjust colors and pattern density), compatible with various screen sizes. Virtual bronze ware exhibitions using VR allow users to closely examine pattern details and even disassemble patterns to explore the cultural meaning of each component.

This approach demonstrates high utilization in museum educational activities. Research indicates that users participating in interactive experience-based products show

a 40% increase in memory retention of bronze culture. However, challenges include "high technical costs" and "limited offline experience scenarios," with only large-scale museums possessing the resources to develop such applications .

### 4. Development Bottlenecks and Deep-Seated Contradictions

*4.1. Superficial Cultural Transformation: Symbol Attachment and Connotation Disconnection*

At present, cultural and creative products featuring bronze animal patterns generally exhibit superficiality in cultural transformation. Most products still follow the primary development model of "pattern replication - carrier grafting," merely copying bronze animal patterns as visual symbols and directly attaching them to various carriers. These products often lack effective interpretation and communication of the core cultural connotations, such as the historical background and symbolic meanings behind the patterns, resulting in a "disconnection between symbols and connotations" in cultural transmission.

In many current market offerings, there is little or no annotation explaining the historical or cultural significance of the patterns. For instance, some phone cases featuring Shang Dynasty beast-faced patterns only print the visual motif on the surface, without conveying the core cultural attributes-namely, that these patterns originate from Shang Dynasty sacrificial vessels and symbolize divine protection and the sanctity of ritual practices. Furthermore, certain products present biased cultural interpretations. For example, Shang Dynasty owl patterns are often treated merely as decorative "owl motifs," overlooking their role as carriers of totem worship and symbols of authority and protection in the Shang period. This leads to misperceptions of bronze culture among users.

The root cause of this issue is the insufficient cultural professionalism within the cultural and creative design sector. On one hand, many design teams lack involvement from experts in archaeology and history, making it difficult to ensure accurate pattern selection and cultural interpretation. On the other hand, cultural and creative designers often do not receive systematic training on bronze culture, resulting in limited understanding of professional content, such as the historical evolution and symbolic meaning of bronze animal patterns. Consequently, the design process often fails to achieve in-depth exploration and accurate transmission of bronze cultural connotations .

*4.2. Homogenization of Innovation: Element Reuse and Carrier Solidification*

Pattern extraction products, as the mainstream application of bronze animal patterns, are currently constrained by "element simplification and carrier standardization," showing a lack of innovation and differentiation. In terms of visual elements, there is a high degree of centralization in reuse: core components, such as the eyes of beast-faced patterns and the scales of dragon patterns, account for more than 80% of applications in pattern extraction products. In contrast, the development and application of diverse elements, including phoenix-bird tail textures, owl feather details, and intertwined dragon structures, remain insufficient, resulting in convergence of visual symbols and limiting the formation of unique cultural expressions.

Regarding carriers, there is an evident trend of standardization. Traditional daily items, such as notebooks and phone cases, represent approximately 75% of products, while innovative carriers for emerging scenarios, such as smart home devices, outdoor equipment, and pet products, are relatively rare. The application boundaries have yet to expand in alignment with the diverse needs of modern users.

For example, the Shanghai Museum and Henan Museum launched bronze pattern bookmarks around the same period, both employing a "bronze green color scheme + pattern line-engraving technique." Visual design similarity evaluations indicate significant overlap in shape, color matching, and craft application, leading to weak differentiation and competitive advantage. A deeper analysis shows that small- and

medium-sized cultural institutions contribute to homogenization: these institutions generally have limited digital resources and lack independent digital databases of bronze patterns. As a result, approximately 90% of pattern extraction product designs directly borrow or imitate schemes from leading institutions, forming a one-way flow of "leading design - replication by smaller institutions," which further constrains innovative development .

*4.3. Imbalanced Resource Allocation: Technological Gap and Regional Disparity*

The cultural and creative industry of bronze animal patterns exhibits a pronounced "technology-resource" Matthew effect in resource allocation, reflected in technological application and regional development disparities, which exacerbate uneven industrial growth.

In terms of technological application, there is a clear gap between large museums and smaller cultural institutions. Large museums, leveraging funding and resource advantages, can invest over 500,000 yuan in developing AR cultural and creative products. In pattern restoration, they use SLA photopolymerization 3D printing technology with precision up to 0.02 mm, accurately presenting detailed bronze pattern textures and ensuring cultural authenticity. In contrast, small- and medium-sized institutions often rely on lower-cost FDM printing with 0.1 mm precision, which cannot fully restore fine pattern details, resulting in rough surfaces and blurred textures, creating a clear quality gap compared to large museums.

Regarding regional development, there is a significant geographical imbalance in the distribution of markets and resources. North and East China, benefiting from concentrated cultural resources and mature consumer markets, account for 70% of the market share for bronze pattern cultural and creative products. Conversely, West China faces dual development challenges due to geographical and industrial constraints. High transportation costs of raw materials increase total production costs, while insufficient design talent limits innovation in cultural and creative products. Consequently, bronze cultural products in West China carry a premium approximately 30% higher than in East China, reducing market competitiveness and limiting the effective transformation of regional cultural resources .

**5. Conclusion**

Currently, cultural and creative products featuring bronze animal patterns exhibit phased characteristics of "coexistence of scale growth and quality lag, and symbiosis of leading-end innovation and trailing-end imitation". At the industrial level, the transformation from "handicrafts" to "cultural and creative products" has been completed, forming a mature industrial chain. At the design level, the expansion from "shape reproduction" to "scene integration" has been realized, yet breakthroughs are still needed in the depth of cultural transformation and the breadth of innovation. At the industrial ecosystem level, the problems of resource centralization and unbalanced development are prominent. In the future, it is necessary to empower cultural interpretation with technology, break homogenization through IP operation, and narrow development gaps via regional collaboration, so as to promote cultural and creative products featuring bronze animal patterns toward a high-quality development stage.

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