

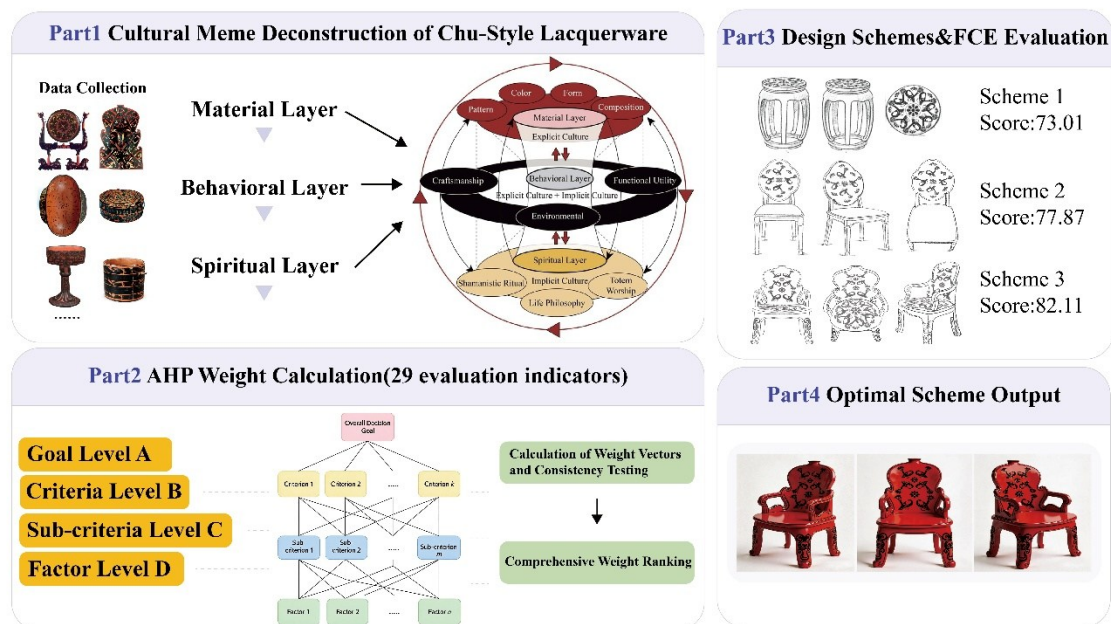
Application of Chu-Style Lacquerware Cultural Elements in Furniture Design Based on the Integrated AHP-FCE Method

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GRAPHICAL ABSTRACT



Application of Chu-Style Lacquerware Cultural Elements in Furniture Design Based on the Integrated AHP-FCE Method

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As global attention to intangible cultural heritage (ICH) continues to grow, the contemporary design adaptation of traditional crafts, such as Chu-style lacquerware, faces a dual challenge: subjective biases in design decision-making and the superficial extraction of cultural connotations. To address these limitations, this study proposes a quantitative design and evaluation framework that integrates memetics, the Analytic Hierarchy Process (AHP), and Fuzzy Comprehensive Evaluation (FCE). First, the cultural memes of Chu-style lacquerware are systematically deconstructed across material, behavioral, and spiritual dimensions, yielding 29 specific evaluation indicators. Second, AHP is applied to calculate the weight of each indicator, establishing the core priority of elements such as phoenix motifs, geometric forms, and the red color palette. Based on these findings, three modern furniture design schemes were developed and objectively assessed using FCE to determine the optimal solution. The results indicate that this integrated approach effectively balances cultural inheritance, aesthetic experience, and functional practicality. This study offers a scientifically rigorous and replicable pathway for the sustainable safeguarding of intangible cultural heritage, while providing a valuable reference for integrating traditional cultural characteristics into modern furniture design.

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Keywords: Chu-style lacquerware; Furniture design; Memetics; Analytic Hierarchy Process (AHP); Fuzzy Comprehensive Evaluation (FCE)

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INTRODUCTION

Intangible cultural heritage (ICH) represents an invaluable cultural asset accumulated throughout the evolution of human civilization, and its protection and transmission have become a global consensus. In the context of the new era, integrating ICH elements into contemporary design is not only an inevitable requirement of national cultural strategies but also a core proposition for promoting the living transmission of ICH and reviving cultural innovation (Yu *et al.* 2025). As a paradigm of object aesthetics and creation wisdom from China's Warring States period, Chu-style lacquerware has a history of over 2,000 years. It should be noted that the surviving exquisitely crafted Chu-style lacquerware pieces were predominantly unearthed from aristocratic tombs, representing the material culture of the upper class. Affected by environmental factors such as temperature, humidity, and light, these burial objects naturally undergo cracking, fading, and powdering. However, due to the anti-corrosive properties of natural raw lacquer and

the craftsmanship of Chu artisans, a considerable number of lacquerware pieces have survived across the millennia to the present day (Bi *et al.* 2025). Existing studies have laid a solid foundation for understanding its historical characteristics. Yu (2016) explored the formal rules and spiritual connotations of Chu-style lacquerware from the dimensions of form, pattern, and color; Wang (2019) analyzed its creation wisdom in the context of daily use; and Pi *et al.* (2024) further categorized its forms, techniques, and types. However, historical research alone cannot adequately resolve the challenges of scientific evaluation and objective implementation when translating Chu-style lacquerware into modern design. Although scholars have begun exploring the modern design translation of Chu-style lacquerware—for instance, Zheng *et al.* (2022) attempted to extract its cultural memes for urban furniture design, and Fan *et al.* (2024) used Kansei Engineering to explore generation paradigms for phoenix patterns—current practices mostly focus on the localized extraction of surface-level symbols, lacking a systematic mapping of deep cultural memes. Furthermore, traditional design methods often rely on subjective experience during the extraction and translation of cultural elements, lacking scientific, quantitative evaluation to improve design precision.

To overcome these limitations, multi-criteria decision-making methods are adopted to establish a systematic logical framework between the perceptual recognition of Chu-style lacquerware cultural memes and the rational parameters of furniture design. The Analytic Hierarchy Process (AHP) can establish a hierarchical evaluation index system to determine the weights of these memes and identify core design elements. Introducing the Fuzzy Comprehensive Evaluation (FCE) method enables a multi-dimensional, comprehensive evaluation of the translated design schemes. Currently, the integrated AHP-FCE method has shown strong applicability in fields such as wooden furniture design and the emotional design of children's furniture. Chen *et al.* (2025) used AHP to build a hierarchical model integrating ICH symbols into furniture design. Meanwhile, Cao *et al.* (2026) integrated the Kano-AHP-VIKOR evaluation and optimization model to scientifically achieve a complete design process for sustainable wooden children's furniture. Similarly, Zhao *et al.* (2024) proposed an evaluation method for innovative tea set designs based on the GT-AHP-FCE model. These theoretical methods provide valuable references that deepen the research of this paper.

In summary, the primary goal of this study was to systematically analyze the cultural connotations of Chu-style lacquerware through the lens of memetics, so as to uncover its latent and less readily perceptible cultural memes, and to subsequently develop furniture designs that meet contemporary aesthetic and user needs. This goal cannot be achieved by reproducing existing Chu-style lacquerware collections, an approach better suited to artifact preservation but incapable of meeting the functional and emotional demands of modern living. To this end, an integrated AHP-FCE comprehensive evaluation method is introduced. The AHP is employed to calculate the weight rankings of Chu-style lacquerware cultural memes, thereby objectively clarifying the priority of core design elements to be applied in modern furniture design. Concurrently, the FCE method is utilized to evaluate the resulting furniture design schemes, ensuring their cultural integrity and scientific validity. Ultimately, this research provides a replicable practical pathway for the living transmission and innovative adaptation of Chu-style lacquerware in modern everyday contexts.

METHODOLOGY

Research Framework

This study seeks to establish a systematic evaluation methodology for furniture design grounded in the cultural memes of Chu-style lacquerware, aiming to achieve a synergistic integration of ICH preservation with contemporary design practices. Initially, the AHP is employed to calculate the weighting of evaluation indicators across hierarchical levels, thereby identifying the high-weight memes that critically influence the design of Chu-style lacquerware furniture. Subsequently, the FCE method is introduced to facilitate a multidimensional assessment of the generated design alternatives. Through integrating quantitative indicator weighting with objective design decision-making, this approach enhances the tangible application and cultural relevance of Chu-style lacquerware in modern contexts. The research framework comprises five sequential stages: basic data collection, cultural meme mapping, core meme weight vector calculation, furniture design alternative generation, and comprehensive evaluation with optimization (Fig. 1):

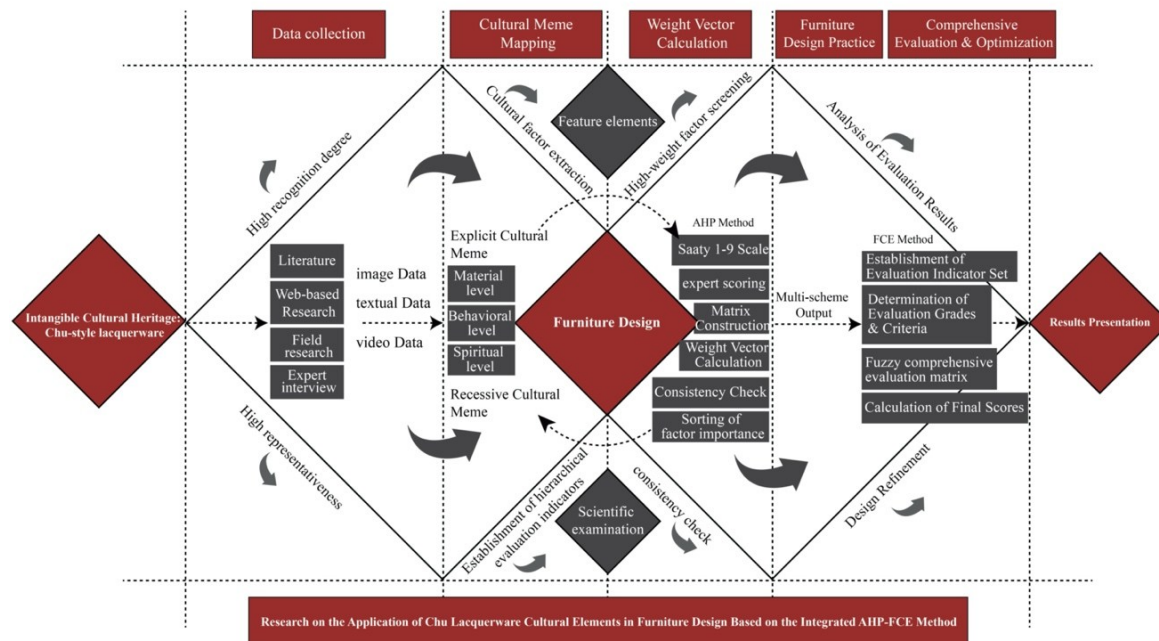


Fig. 1. Flowchart of the AHP-FCE integrated research framework

- (1) *Collecting Basic Data:* To ensure the research samples are representative, primary data is gathered through multiple channels, including literature reviews, field studies, and expert interviews. The collected images, texts, and videos are systematically organized and classified. Highly recognizable and representative samples of Chu-style lacquerware are selected, establishing a solid foundation for extracting cultural memes.
- (2) *Mapping the Cultural Memes:* Guided by the principles of memetics, the selected samples are deconstructed across material, behavioral, and spiritual dimensions. By distilling the defining characteristics of Chu-style lacquerware—specifically its ornamental patterns, chromatic schemes, and formal configurations—this process systematically constructs a cultural meme map, which is subsequently translated into a hierarchical evaluation indicator system.

- (3) *Calculating Core Meme Weight Vectors*: To quantify and filter the cultural memes, experts in relevant fields are invited to conduct pairwise importance comparisons using Saaty's 1 to 9 scale. Through constructing a judgment matrix and applying a strict consistency check, the weight rankings of the memes are scientifically determined, allowing for the extraction of high-weight elements to guide the design process.
- (4) *Developing Furniture Design Alternatives*: Using the high-weight memes as a core focus, the cultural elements of Chu-style lacquerware are translated into furniture design. Within this framework, three distinct modern furniture design alternatives are developed, closely reflecting the aesthetic features and cultural significance of the lacquerware.
- (5) *Comprehensive Evaluation and Optimization*: To minimize subjective bias in decision-making, the FCE method is employed for a multi-criteria evaluation of the design alternatives. Combining this with the previously established indicator weights, a panel of experts systematically evaluates the three preliminary designs. The optimal design is selected based on these evaluation results and is further refined, ensuring the final product successfully balances the multi-dimensional goals of cultural preservation, functionality, and aesthetics.

Memetics

The concept of the “meme” was first introduced by British biologist Richard Dawkins in his seminal 1976 work, *The Selfish Gene*. Drawing an analogy to the self-replicating and hereditary properties of biological genes, Dawkins defined the fundamental unit of cultural transmission as a “meme.” He posited that culture, operating through mechanisms of imitation, retention, and transmission, undergoes an evolutionary process characterized by replication, mutation, and selection—akin to that of living organisms. Since its adoption within the field of design research, memetics has frequently been employed as a robust analytical tool. This theoretical lens enables researchers to transcend the explicit formal attributes of artifacts and, instead, extract cultural memes to reveal their deeper, underlying connotations (Dawkins 2016). For instance, Li *et al.* (2023) extracted cultural memes from ancient towns in Hunan Province, thereby offering a novel perspective for the scientific conservation of traditional settlements. Similarly, Liu and Lei (2023) constructed a cultural meme map for Mongolian yurts through the lens of cultural field theory. Consequently, memetic theory facilitates the identification and extraction of core elements—such as form, pattern, and color—that constitute the essential stylistic “soul” of an artifact amidst its complex cultural manifestations. Although the physical substrate may evolve over time, the core cultural essence retains stable characteristics through processes of continuous recombination and cross-media translation. In summary, drawing upon the principles of memetics, the cultural system of Chu-style lacquerware is deconstructed into a hierarchical framework comprising three interconnected dimensions: the material layer, the behavioral layer, and the spiritual layer (Fig. 2). The material layer represents explicit culture, encapsulating the morphological features of Chu-style lacquerware through visual expressions including pattern, color, form, and composition. The behavioral layer exists at the interface between the explicit and the implicit, manifesting the logic of creation through craftsmanship, functional utility, and environmental context. Finally, the spiritual layer constitutes the realm of implicit culture, embedded within the profound consciousness of Chu civilization and encompassing shamanistic ritual, totemic worship, and fundamental life philosophy. These three layers

are mutually interpenetrating, collectively constituting the holistic cultural system of Chu-style lacquerware.

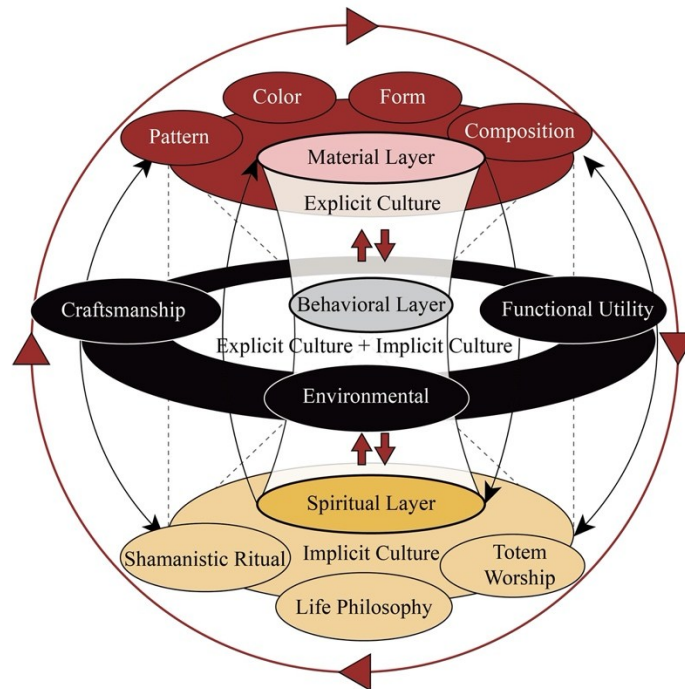


Fig. 2. Hierarchical analysis of cultural memes in Chu-style lacquerware

Analytic Hierarchy Process

The AHP is a foundational method in the field of multi-criteria decision making (MCDM). Its core logic involves decomposing complex, multi-objective decision problems into a hierarchical structure, converting the subjective judgments of experts into quantitative indicator weights, and ultimately prioritizing multi-dimensional alternatives (Frish *et al.* 2025). To accurately identify and screen the cultural memes of Chu-style lacquerware, this study employs the AHP method to integrate professional evaluations from art and design experts as well as intangible cultural heritage scholars. A systematic hierarchical model was constructed around dimensions, such as material, behavior, and spirit, establishing a quantifiable weight evaluation system. The specific calculation steps are as follows:

- (1) *Construction of the Hierarchical Structure Model:* Based on the analysis of cultural memes in Chu-style lacquerware conducted in the previous section, this study deconstructs complex cultural elements into a hierarchical evaluation index system. Following a top-down principle, a four-level hierarchical model was developed. This structure consists of the target layer (Level A), comprehensive layer (Level B), evaluation layer (Level C), and factor layer (Level D).
- (2) *Construction of the Judgment Matrix:* The construction of the judgment matrix is a fundamental step in AHP. In this study, Saaty's 1 to 9 scale (Table 1) is utilized to conduct pairwise comparisons regarding the relative importance of indicators within the same hierarchical level. For n criteria, the judgment matrix A is an $n \times n$ matrix where a_{ij} represents the importance score of element i relative to element j . The general form of the judgment matrix is:

$$A = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ \frac{1}{a_{12}} & 1 & \cdots & a_{2n} \\ a_{12} & \frac{1}{a_{12}} & \ddots & \vdots \\ \vdots & \vdots & \ddots & \vdots \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & \cdots & 1 \end{bmatrix} \quad (1)$$

- (3) *Calculation of the weight vector*: The weight of each indicator is calculated using the geometric mean method. Through calculating the maximum eigenvalue $\lambda_{\max}$ of the judgment matrix A and its corresponding eigenvector W , the weight allocation of each indicator can be obtained. The calculation formula is,

$$AW = \lambda_{\max} W \quad (2)$$

where W is the weight vector after normalization.

- (4) *Consistency Verification*: To ensure the logical rigor of the expert judgment matrix and avoid logical inconsistencies (e.g., if $A > B$ and $B > C$, then C should not be $> A$), a consistency check must be performed. The formula for calculating the Consistency Index (CI) is as follows:

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (3)$$

Subsequently, calculate the Consistency Ratio (CR),

$$CR = \frac{CI}{RI} \quad (4)$$

where RI is the Random Index, the value of which depends on the order of the matrix (n). When $CR < 0.1$, the judgment matrix A is generally considered to satisfy the consistency requirement; otherwise, adjustments to the matrix are necessary.

The 1 to 9 scale is adopted to perform pairwise importance comparisons between factors, where the two values symmetric across the diagonal are reciprocals of each other.

Table 1. The 1-9 Fundamental Scale

Scale	Meaning
1	Two factors are compared and are of equal importance.
3	One factor is slightly more important than the other.
5	One factor is obviously more important than the other.
7	One factor is much more important than the other.
9	One factor is extremely more important than the other.
2,4,6,8	Represent the intermediate states between the scales above.
Reciprocals of the above values	Represent the importance when the order of the two factors is swapped.

Fuzzy Comprehensive Evaluation

Fuzzy Comprehensive Evaluation is a multi-criteria decision-making method based on fuzzy set theory, designed to quantify factors that are ambiguous or difficult to measure (Zadeh 1965). In the process of transforming Chu-style lacquerware into furniture design, evaluation indicators—such as “cultural inheritance” and “aesthetic experience”—often

involve strong subjective perception and cognitive fuzziness. To reduce bias in subjective decision-making, this study introduces the FCE method to conduct a systematic quantitative assessment of furniture design schemes, building upon the core indicator weights previously determined by the AHP. The specific implementation steps are as follows:

- (1) *Establish the Comprehensive Evaluation Factor Set (U):* The factor set is a collection of all relevant characteristic indicators of the evaluation object. It directly corresponds to the evaluation index system constructed previously using the AHP and is expressed as,

$$U = (u_1, u_2, \dots, u_n) \quad (5)$$

where n is the number of evaluation indicators in the factor set.

- (2) *Establish the Evaluation Set (V):* The evaluation set is a collection of possible grade results for the evaluation. This study adopts a Likert five-point scale to grade each indicator of the design scheme, expressed as:

$$V = (v_1, v_2, v_3, v_4, v_5) \quad (6)$$

These correspond to five evaluation levels: “Very Satisfied,” “Satisfied,” “Neutral,” “Dissatisfied,” and “Very Dissatisfied.” To facilitate the quantitative ranking of the final schemes, the assigned value vector for the corresponding levels is set as $E = (90, 75, 60, 45, 30)^T$.

- (3) *Determine the Factor Weight Set (W):* The weight set reflects the importance of each factor in the evaluation. Based on the previous AHP calculation results, the normalized weights of the indicators at each level are extracted to construct the weight vector,

$$W = (w_1, w_2, \dots, w_n), \sum_{i=1}^n w_i = 1 \quad (7)$$

where w_i is the weight corresponding to the i evaluation indicator u_i .

- (4) *Construct the Fuzzy Comprehensive Evaluation Matrix (R):* Experts are organized to score each indicator of the candidate design schemes. The frequency of each indicator u_i corresponding to evaluation grade v_j is counted and normalized to calculate the membership degree r_{ij} , thereby forming the fuzzy relationship matrix R from the factor set to the evaluation set:

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{15} \\ r_{21} & r_{22} & \cdots & r_{25} \\ \vdots & \vdots & \ddots & \vdots \\ r_{n1} & r_{n2} & \cdots & r_{n5} \end{bmatrix} \quad (8)$$

- (5) *Fuzzy Synthetic Operation:* The weighted average operator is selected for fuzzy synthesis. Through combining the indicator weight set W with the fuzzy evaluation matrix R , the fuzzy comprehensive evaluation vector B is obtained,

$$B = W \times R = [b_1, b_2, b_3, b_4, b_5] \quad (9)$$

where b_j is the j element of the comprehensive evaluation vector, representing the membership degree of the candidate scheme to the j evaluation grade.

- (6) *Determine the Final Evaluation Result:* To accurately compare multiple candidate schemes horizontally, the fuzzy comprehensive evaluation vector B is “defuzzified.” An inner product operation is performed between vector B and the quantified value vector E to derive the final comprehensive score S for the scheme:

$$S = B \times E = \sum_{j=1}^5 b_j \cdot e_j \quad (10)$$

The furniture design schemes are then ranked according to their comprehensive score S ; the scheme with the highest score is the optimal solution.

EXPERIMENTAL

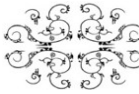
The Material Culture of Chu-style Lacquerware

Chu-style lacquerware, which matured during the Spring and Autumn and Warring States periods, represents a lacquer art tradition centered in the Jiangnan Plain region. Using natural raw lacquer as the primary coating material and wood, bamboo, or pottery as the base body, it was crafted through multiple processes including lacquer application, color painting, and carving. The finished pieces combine practical functionality with decorative aesthetics and rich cultural significance. Since the Chu-style lacquerware decoration technique was inscribed on China’s National Intangible Cultural Heritage List in 2011, its value as part of Chinese cultural heritage has become increasingly prominent. This traditional craft, which integrates body construction, lacquer coating and painting, as well as carving and inlay work, has provided a wealth of formal references for later generations of artifact design (Wu *et al.* 2024). The visual materials presented in Tables 2–5 in this section were all sourced from published monographs on Chu-style lacquerware and high-resolution artifact images released on official museum websites. All images are authentic and reliable.

- (1) *Pattern Extraction:* The decorative patterns of Chu-style lacquerware display both strong continuity and distinct originality. While preserving the rigorous and mysterious qualities found in Shang and Zhou bronze art, these patterns break free from earlier constraints in visual expression, conveying a romantic spirit through dynamic and fluid forms. Chu-style lacquerware patterns fall into five main categories: animal motifs, plant motifs, natural landscape motifs, geometric motifs, and scenes of social life (Table 2). Animal motifs include phoenixes, dragons, tigers, snakes, and toads, with the phoenix pattern being the most representative and serving as a symbolic expression of totem worship among the Chu people. Plant motifs emerged during the Warring States period, with petal patterns, fusang patterns, and willow patterns as typical examples. Among them, petal patterns frequently appear as the central decorative element on lacquer boxes. Natural landscape motifs include cloud patterns, whirlpool patterns, and thunder patterns. Curling cloud patterns often adorn everyday utensils, such as lacquer boxes and lacquer ear cups, and by the middle and late Warring States period, they combined with other decorative elements to create flowing, dynamic visual effects. Geometric motifs, such as diamond patterns, dot patterns, and triangular patterns, are commonly found on the plates and stems of *dou* vessels, where they serve a

primarily ornamental function. From the Warring States period onward, motifs depicting social life gained increasing prominence. The “Chariots and Horse Procession” scene on a lacquer *lian* (cosmetic case) stands as the most representative example. It not only reflects the shamanistic beliefs and social customs of the time but also marks the beginning of a realist tradition in Chinese lacquer decorative art (Wang and Xu 2021).

Table 2. Extraction of Chu-style Lacquerware Patterns

Pattern Category	Pattern Prototype	Pattern Extraction	Meaning
Animal Motif (D ₁)			Phoenix Pattern (Totem Worship)
Plant Motif (D ₂)			Petal Pattern (Life and Propagation)
Natural Landscape Motif (D ₃)			Cloud Pattern (Connection Between Heaven and Earth)
Geometric Motif (D ₄)			Diamond Pattern (Order and Regularity)
Social life Motif (D ₅)			Chariot and Horse Procession Pattern (Hierarchical Order)

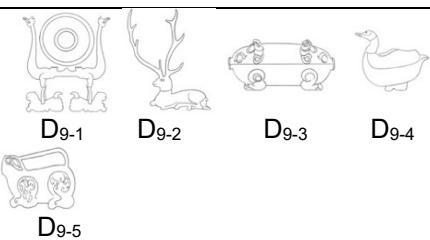
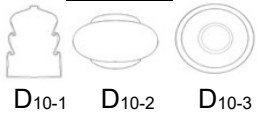
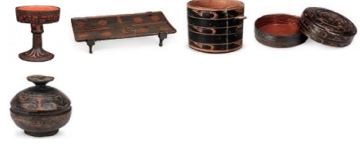
- (2) *Color Extraction:* The surface colors of Chu lacquerware display striking contrasts, with black and red being the two most frequently used hues. The black coating is largely derived from natural raw lacquer, imparting a deep and somber tone, while the red is extracted from cinnabar, producing a bright and vivid warmth. This interplay of colors—black serving as the background and vermilion providing the outline—extends beyond mere visual decoration; it embodies the Chu people’s primal reverence for heaven, earth, and the natural world. In addition to the red-and-black palette, a more complex range of colors was also employed, including yellow, brown, cyan, ochre, and green.

Table 3. Extraction of Chu-style Lacquerware Colors

Color Category	Color Prototype	Color Extraction	Meaning
Red Tones (D ₆)			Nobility
Black Tones (D ₇)			Solemnity
Composite Tones (D ₈)			Brilliance and Romanticism

- (3) *Form Extraction*: The forms of Chu-style lacquerware embody the aesthetic sensibilities and principles of craftsmanship held by the Chu people. Based on their outward characteristics, these forms can be grouped into three main categories: biomorphic forms, geometric forms, and functional forms (Table 4). Biomorphic forms often draw inspiration from natural creatures, such as deer, birds, and tigers, and through processes of refinement and abstraction they endow the objects with a vivid, dynamic vitality. Geometric forms are built upon basic shapes, such as circles, squares, and ovals, conveying a sense of disciplined and rational structure. Functional forms, in turn, are closely tied to the practical demands of daily life and ritual ceremonies, with an emphasis on capacity and use. In the process of designing and transforming these shapes, the Chu people skillfully employed artistic techniques, such as replication, distortion, exaggeration, and combination, thereby establishing the distinctive formal character of Chu-style lacquerware.

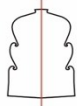
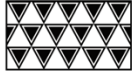
Table 4. Extraction of Chu-style Lacquerware Forms

Form Category	Form Prototype	Form Extraction
Biomorphic Forms (D ₉)		 D ₉₋₁ D ₉₋₂ D ₉₋₃ D ₉₋₄ D ₉₋₅
Geometric Forms (D ₁₀)		 D ₁₀₋₁ D ₁₀₋₂ D ₁₀₋₃
Functional Forms (D ₁₁)		 D ₁₁₋₁ D ₁₁₋₂ D ₁₁₋₃ D ₁₁₋₄ D ₁₁₋₅

- (4) *Compositional Extraction*: Pattern composition refers to the process of organizing, arranging, and combining formal elements that carry specific cultural meanings within two-dimensional or three-dimensional space, following principles of aesthetic form and logical structure (Lin *et al.* 2025). Through deconstructive analysis of the surface ornamentation on Chu-style lacquerware, the distribution of decorative patterns can be categorized into types, such as bilateral symmetry about a central axis, axial symmetry, two-directional continuous patterns, four-directional continuous patterns, and rotational symmetry (Table 5). The composition of patterns on Chu-style lacquerware is not a random accumulation of elements; rather, it represents a systematic schema achieved through careful control of spatial rhythm and cadence. Symmetrical structures convey stability. Types, such as bilateral symmetry about a central axis (D₁₂) and axial symmetry (D₁₃), achieve visual balance through strict geometric alignment, creating a

solemn, stable, and harmoniously gathered visual tension. Continuous structures impart a sense of order. These include two-directional continuous patterns (D₁₄) and four-directional continuous patterns (D₁₅), whose logical arrangement produces a flowing and orderly rhythmic beauty. In contrast, rotational symmetry (D₁₆) employs centripetal spiral movement to break away from conventional static balance, imbuing the visual field with dynamic energy and motion.

Table 5. Extraction of Chu-style Lacquerware Composition

Composition Category	Composition Prototype	Composition Extraction	Meaning
Bilateral Symmetry (D ₁₂)			Stability
Axial Symmetry (D ₁₃)			Balance
Two-Directional Continuous Pattern (D ₁₄)			Order
Four-Directional Continuous Pattern (D ₁₅)			Intricacy
Rotational Symmetry (D ₁₆)			Focal Concentration

The Behavioral Culture of Chu-style Lacquerware

- (1) *Extraction of Craft Techniques:* The production techniques of Chu-style lacquerware originated in the Shang dynasty, matured by the middle Spring and Autumn period, and continued to develop through the late Warring States period. These techniques can be systematically divided into several categories: body construction, lacquer coating and surface finishing, decoration, and structural assembly (Table 6). First, body construction (D₁₇) forms the foundation of Chu-style lacquerware. Depending on the intended use of the object, materials were selected, such as wood, leather, *jia Zhu*, bamboo, pottery, and gourd, establishing the fundamental character of the piece. Lacquer coating and surface finishing techniques (D₁₈) reached maturity during the Warring States period. They generally followed a standardized sequence of mixing lacquer, applying a ground layer and smoothing the putty filler, brushing on surface coats, and then allowing the piece to dry under controlled humidity conditions before polishing. This process created a solid base for subsequent decoration. Decorative techniques (D₁₉) employed a wide range of methods including lacquer painting, carving, needle-

incised engraving, raised lacquer application, and inlay work, all of which endowed the outer surfaces of the lacquerware with strong expressive power. Structural techniques (D₂₀), in turn, utilized methods, such as mortise-and-tenon joinery, layered assembly and lamination, and sculptural modeling, to ensure the object's physical stability while shaping its artistic form.

Table 6. Extraction of Chu-style Lacquerware Craft Techniques

Crafting Category	Production Steps
Body Construction Techniques (D ₁₇)	Wood, Leather, Jiazhu, Bamboo, Pottery, and Gourd
Lacquer Coating and Surface Finishing Techniques (D ₁₈)	Mixing lacquer, applying ground layer and smoothing putty filler, applying surface coats, drying under controlled humidity and polishing
Decorative Techniques (D ₁₉)	Lacquer painting, carving, needle-incised engraving, raised lacquer application, and inlay work
Structural Techniques (D ₂₀)	Mortise-and-tenon joinery, layered assembly and lamination, sculptural modeling

- (2) *Extraction of Functional Uses:* According to their functions and purposes, Chu-style lacquerware can be divided into two major categories: *Mingqi* and *Yangqi* (Table 7). *Mingqi* are rooted in the funerary and ritual culture of the Chu region and were specifically made for ceremonies such as sacrifices and burials. The artistic forms of these objects carry strong symbolic meanings. Their patterns are elaborate, their shapes are expressive, and they project an atmosphere that is both solemn and romantic, serving as material embodiments of Chu funerary customs and spiritual beliefs. In contrast, *Yangqi* correspond to the everyday life of the Chu people and embody their practical wisdom. Their forms are closely adapted to utilitarian needs, directly reflecting the functional nature of lacquerware production as well as the daily lifestyle and aesthetic sensibilities of Chu society.

Table 7. Extraction of Chu-style Lacquerware Functional Uses

Functional Uses	Meaning
<i>Mingqi</i> (D ₂₁)	Represents funerary and ritual behavior; serves as a medium for communication between humans and the divine; characterized by a solemn yet romantic atmosphere.
<i>Yangqi</i> (D ₂₂)	Represents activities of everyday life; functions as tools for eating, drinking, storage, and other domestic tasks; exhibits a rational and disciplined character.

- (3) *Extraction of Environmental Factors:* The environmental factors of Chu-style lacquerware refer to the core characteristics shaped by specific natural, cultural, social, and craft contexts (Table 8). The Chu state was located in the south, where favorable natural conditions provided a solid foundation for the use of natural raw lacquer. The distinctive shamanistic and spirit beliefs of the Chu people further established lacquerware as an important medium for communication between humans and the divine, thereby giving rise to a large number of objects used in

sacrificial rites and funerary practices. At the same time, advances in social productivity and the refinement of craft techniques offered strong support for the flourishing of lacquer art. Moreover, the tradition of master-to-apprentice transmission, which lay at the heart of artisan practice, ensured the continuity and steady improvement of core skills, ultimately shaping the unique craft language of Chu-style lacquerware.

Table 8. Extraction of Chu-style Lacquerware Environmental Factors

Environmental Factors Category	Meaning
Natural Environment (D ₂₃)	The Chu state was located in the south, characterized by lush vegetation and a long-standing agricultural civilization deeply reliant on the natural environment.
Cultural Environment (D ₂₄)	The Chu people regarded lacquerware as a medium for communication between humans and the divine, which stimulated the production of large quantities of ritual and funerary lacquer objects.
Social Environment (D ₂₅)	Advances in social productivity led to increasingly refined iron tools and openwork carving techniques, contributing to the flourishing of Chu-style lacquerware art.
Craft Environment (D ₂₆)	Chu artisans transmitted lacquer techniques through hereditary lineage and oral instruction with heartfelt understanding, ensuring the continuity of their craft.

The Spiritual Culture of Chu-style Lacquerware

The spiritual core of Chu-style lacquerware is rooted in three fundamental cultural traditions of the Chu region. The first is a ritual culture deeply invested in shamanistic practices. As recorded in Zhu Xi's *Collected Commentaries on the Songs of Chu*, the Chu people maintained a tradition of "believing in spirits and holding sacrifice in high regard." Within this context, lacquerware transcended its practical utility to become a ritual medium through which shamans and sorcerers communicated with deities, summoned spirits, and called back souls. The logic of its creation thus shifted from functional concerns toward spiritual narrative, rendering lacquerware a material embodiment of the Chu worldview and their conception of life.

The second tradition is a totemic worship centered on the veneration of the phoenix and fire. The Chu people regarded themselves as descendants of Zhurong, the God of Fire, and revered the phoenix both as the totem of their clan and as the embodiment of flame. This gave rise to a system in which ancestral consciousness and totemic belief were deeply intertwined. The phoenix motifs adorning Chu-style lacquerware are therefore far more than simple ornamentation; they carry sacred connotations of bridging heaven and earth and function as core aesthetic symbols reflecting ethnic identity and the perceived continuity of the clan's existence.

The third tradition is the life philosophy of harmony between heaven and humanity. The religious sentiments emerging from shamanistic culture fostered an aesthetic sensibility among the Chu people that esteemed the natural world. Their dualistic conception of the soul—comprising hun (ethereal soul) and po (corporeal soul)—allowed them to translate the rhythms of cosmic life into the dynamic lines, flowing patterns, and brilliant colors of lacquerware. In this way, artistic form and the vital spirit of Chu culture achieved a profound unity (Table 9).

Table 9. Extraction of Chu-style Lacquerware Spiritual Culture

Spiritual Cultural Category	Concrete Expression	Meaning
Shamanistic Rituals	Communication Between Humans and the Divine (D ₂₇)	The Chu people revered shamanistic practices and regarded lacquerware as a material vehicle for connecting the secular world with the realm of spirits.
Totemic Worship	Veneration of the Phoenix and Fire (D ₂₈)	The Chu people considered themselves descendants of <i>Zhurong</i> and revered the phoenix both as the embodiment of fire and as the totem of their clan.
Life Philosophy	Harmony Between Heaven and Humanity (D ₂₉)	The Chu people esteemed a symbiotic relationship with nature. Through crafting objects from natural raw lacquer, they embodied a philosophical outlook of learning from nature and achieving a state of self-forgetfulness in creation.

Construction of the Hierarchical Demand Analysis Model

This study undertakes a systematic deconstruction of Chu-style lacquerware as an item of intangible cultural heritage, conducting research across three dimensions: the material culture level (patterns, colors, forms, and composition), the behavioral culture level (craft techniques, functional uses, and environmental context), and the spiritual culture level (shamanistic rituals, totemic worship, and life philosophy). Through extracting and analyzing core cultural memes, a demand hierarchy analysis model based on the AHP is constructed (Fig. 3). In this model, “Application Demands of Chu-style lacquerware Cultural Memes in Furniture Design” serves as the Goal Level (A). The criteria are further refined into three specific sub-goals: the Material Level (B₁), which represents explicit visual representation; the Behavioral Level (B₂), which embodies the logic of craftsmanship; and the Spiritual Level (B₃), which encompasses deeper layers of consciousness. These levels extend downward to include 10 evaluation criteria (Level C) and 29 specific cultural factors (D₁ to D₂₉). This framework enables a rigorous quantitative analysis and weight calculation to determine the priority of Chu-style lacquerware cultural elements in furniture design.

Calculation of Weight Vectors and Consistency Testing

To ensure the rigor and professional validity of the evaluation criteria assigned to Chu-style lacquerware, this study invited a panel of 30 experts (18 males, 12 females; aged 32 to 58 years) from relevant fields to participate in the assessment. The panel consisted of ten researchers specializing in Chu-style lacquerware archaeology, lacquerware conservation, and Chu cultural studies (with 8 to 20 years of research experience), five furniture designers focusing on modern and new Chinese-style furniture design (each with over 10 years of industry practice), ten university faculty members in product design (whose research areas cover product design, furniture design, and cultural creative product design), and five consumers with a sustained interest in traditional crafts and intangible cultural heritage. All members possess substantial academic background and professional experience within their respective domains. During the evaluation process, the Saaty 1–9 fundamental scale (Table 1) was employed to conduct pairwise comparisons and assign scores to the indicators at each hierarchical level. Subsequently, the geometric mean

method was applied to calculate the weight vector for each indicator, resulting in the construction of the complete set of judgment matrices for all levels (Table 10).

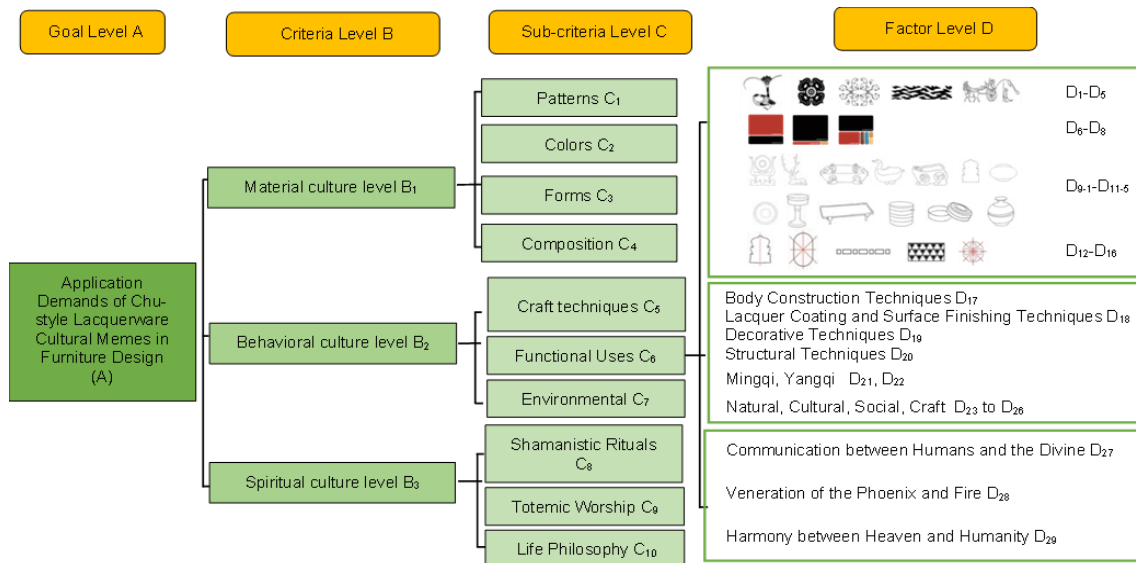


Fig. 3. A hierarchical demand model for furniture design in the Chu-style lacquerware

Table 10. A-Level Judgment Matrix and Weights

A	B ₁	B ₂	B ₃
B ₁	1.000	1.200	2.500
B ₂	0.833	1.000	1.667
B ₃	0.400	0.600	1.000
Weight	0.454	0.351	0.195
Rank	1	2	3

To verify the logical rigor of the calculation results, the consistency index (CI) and the average random consistency index RI are introduced to obtain the consistency ratio (CR). According to the standards of the AHP method, the obtained weights are considered valid only when $CR < 0.1$. If this standard is not met, the scores must be adjusted through an expert feedback mechanism to ensure that the final results pass the consistency check. In this instance, the values of both the CI and the CR for the goal level A are less than 0.1, indicating that the judgment matrix of the criteria level has a high degree of consistency, and the weight ranking $B_1 > B_2 > B_3$ meets the consistency test standards (Table 11).

Table 11. Consistency Test Results for the A-Level Judgment Matrix

λ_{max}	CI Value	RI Value	CR Value	Consistency Test Result
3.006	0.003	0.520	0.005	Passed

Simultaneously, the same methodology was applied to construct judgment matrices for the sub-indicators under the criteria level (B₁ to B₃), thereby completing the hierarchical comparisons and weight calculations. The material culture level (B₁) encompasses four sub-criteria (C₁ to C₄), with the weight ranking ordered as $C_1 > C_3 > C_2 > C_4$ (Table 12). The behavioral culture level (B₂) comprises three sub-criteria (C₅ to C₇), with the weight ranking ordered as $C_5 > C_7 > C_6$ (Table 13). The spiritual culture level (B₃) includes three

sub-criteria (C_8 to C_{10}), with the weight ranking ordered as $C_9 > C_8 > C_{10}$ (Table 13). Consistency tests were subsequently performed on the judgment matrices for each of these Criteria Level components. The results indicate that the CR values for B_1 , B_2 , and B_3 are 0.000, 0.006, and 0.002, respectively—all falling well below the threshold of 0.1. This confirms that all judgment matrices at the sub-criteria level have successfully passed the consistency check (Table 14).

Table 12. B_1 -Level Judgment Matrix and Weights

B_1	C_1	C_2	C_3	C_4
C_1	1.000	2.500	1.250	4.505
C_2	0.400	1.000	0.500	1.799
C_3	0.800	2.000	1.000	3.597
C_4	0.222	0.556	0.278	1.000
Weight	0.413	0.165	0.330	0.092
Rank	1	3	2	4

Table 13. B_2 -Level and B_3 -Level Judgment Matrix and Weights

B_2	C_5	C_6	C_7	B_3	C_8	C_9	C_{10}
C_5	1.000	2.451	1.848	C_8	1.000	0.620	1.550
C_6	0.408	1.000	0.600	C_9	1.613	1.000	2.151
C_7	0.541	1.667	1.000	C_{10}	0.645	0.465	1.000
Weight	0.510	0.193	0.297	Weight	0.311	0.478	0.211
Rank	1	3	2	Rank	2	1	3

Table 14. Consistency Test Results for the B-Level Judgment Matrix

Project	λ_{max}	CI Value	CR Value	Consistency Test Result
B_1	4.000	0.000	0.000	Passed
B_2	3.006	0.003	0.006	Passed
B_3	3.003	0.001	0.002	Passed

Comprehensive Weight Ranking

The Factor Level (Level D) encompasses a substantial number of factors, spanning D_1 through D_{29} . Through hierarchical comparison, the weight values and corresponding rankings for each factor can be determined. With regard to patterns, the ranking is ordered as $D_1 > D_3 > D_4 > D_2 > D_5$, indicating that the Animal Motif (D_1) is the key decorative element for conveying the romantic spirit of Chu culture in furniture design. For colors, the ranking order is $D_6 > D_7 > D_8$, with the Red Tones (D_6) best capturing the natural vitality, nobility, and auspiciousness of Chu-style lacquerware through chromatic layering. Through extracting line drawings of Chu-style lacquerware forms and conducting pairwise comparisons among the three form categories, the resulting ranking is $D_{10} > D_9 > D_{11}$, suggesting that Geometric Forms (D_{10}) should serve as a primary reference for furniture morphology. Regarding composition, the ranking is $D_{16} > D_{12} > D_{14} > D_{13} > D_{15}$, with Rotational Symmetry (D_{16}) emerging as the most significant element. In terms of craft techniques, the weight ranking is $D_{19} > D_{20} > D_{18} > D_{17}$, wherein Decorative Techniques (D_{19}) received the highest weight. For functional uses, the ranking is $D_{21} > D_{22}$, indicating that the ritual solemnity embodied in *Mingqi* (D_{21}) constitutes an important cultural factor. Concerning environmental factors, the ranking is $D_{24} > D_{23} > D_{26} > D_{25}$, demonstrating that the Cultural Environment (D_{24}) of Chu-style lacquerware was a pivotal factor driving its

production. Finally, a pairwise comparison of the spiritual cultural factors of Chu-style lacquerware reveals an importance ranking of $D_{28} > D_{27} > D_{29}$, with the Veneration of the Phoenix and Fire (D_{28}) receiving the highest weight among the three (Table 15).

Table 15. D-Level Judgment Matrix and Weights

D	Rank	Weight	D	Rank	Weight
D ₁	1	0.410	D ₁₆	1	0.385
D ₂	4	0.134	D ₁₇	4	0.089
D ₃	2	0.225	D ₁₈	3	0.167
D ₄	3	0.168	D ₁₉	1	0.468
D ₅	5	0.063	D ₂₀	2	0.276
D ₆	1	0.518	D ₂₁	1	0.682
D ₇	2	0.356	D ₂₂	2	0.318
D ₈	3	0.126	D ₂₃	2	0.236
D ₉	2	0.356	D ₂₄	1	0.430
D ₁₀	1	0.489	D ₂₅	4	0.114
D ₁₁	3	0.155	D ₂₆	3	0.220
D ₁₂	2	0.266	D ₂₇	2	0.311
D ₁₃	4	0.105	D ₂₈	1	0.457
D ₁₄	3	0.188	D ₂₉	3	0.232
D ₁₅	5	0.056			

Design Schemes

Based on the AHP weight evaluation results for Chu-style lacquerware cultural memes in furniture design, an integrated design workflow was established, comprising “core factor selection—strategy formulation—design practice.” Priority is given to high-weight explicit factors from the Material Culture Level, such as “Animal Motif (D_1),” “Red Tones (D_6),” “Geometric Forms (D_{10}),” and “Rotational Symmetry (D_{16}).” These elements are rigorously adopted as the primary objects of visual translation to ensure that the resulting designs possess immediate stylistic recognizability. Concurrently, the design Schemes explore core indicators from the Behavioral and Spiritual Culture Levels. Elements that combine both explicit and implicit dimensions—such as Decorative Techniques (D_{19}), Mingqi (D_{21}), and Cultural Environment (D_{24})—are transformed into vehicles of cultural depth and ritual sensibility within contemporary furniture design. Ultimately, modern design techniques of deconstruction, recombination, and variation are employed to achieve a dynamic equilibrium between the cultural inheritance of quintessential Chu-style lacquerware elements and the practical functionality and aesthetic experience demanded by furniture design.

- Scheme 1:** This scheme employs the high-weight factors of Chu-style lacquerware as explicit visual representations. The external form is built upon a circular foundation derived from Geometric Forms (D_{10}). A streamlined, vertically pierced support structure ensures both the stability of the base and a sense of visual lightness. Adhering to the formal aesthetic principle of Rotational Symmetry (D_{16}), the high-weight Phoenix Pattern (D_1) is positioned at the center of the seat. This arrangement creates a rhythmic visual effect in which the phoenix motifs appear interconnected head-to-tail, revolving inward toward the center. The design endows the furniture piece with a strong sense of visual focus and vital energy. While meeting the requirements of modern ergonomics, it profoundly resonates with the Chu cultural spirit of “Venerating the Phoenix and Fire” (D_{28}) and the traditional cosmological concept of “round heaven and square earth.” (Fig. 4).

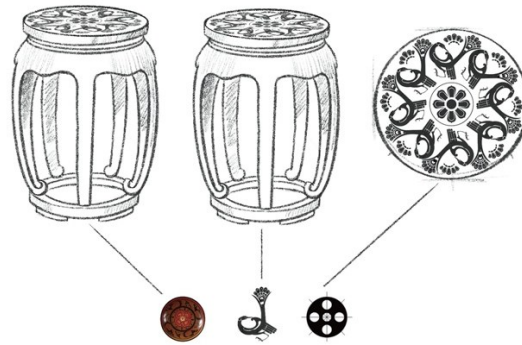


Fig. 4. Sketch design Scheme 1

- Scheme 2:** This scheme focuses on the modern transformation of vessel forms. Its exterior silhouette is derived from the shape of the lacquer ear cup, a high-weight factor in the evaluation framework. The design subtly translates the curved contours on both sides of the ear cup into the curved edge surfaces of the chair back, achieving an ideal ergonomic fit with the natural curve of the human back when seated. Regarding the application of decorative patterns, the Phoenix Pattern (D_1) is arranged at the center of the chair back following the principle of Rotational Symmetry (D_{16}). Through a carefully balanced use of blank space with varied density, the design radiates the distinctive free and romantic spirit of Chu culture within a structured geometric order. This scheme satisfies the user's desire for traditional aesthetics within the context of everyday furniture design (Fig. 5).

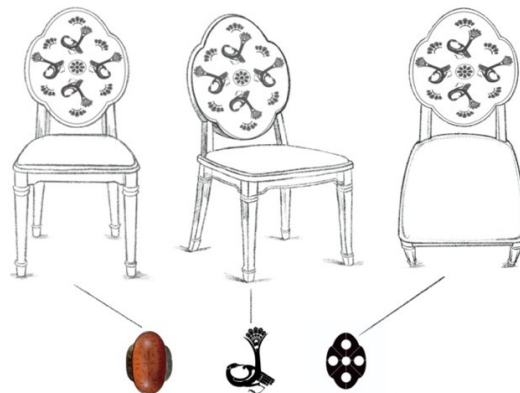


Fig. 5. Sketch design Scheme 2

- Scheme 3:** The overall form of this scheme conveys a pronounced sense of solemnity. Its external appearance is derived from the lacquer shield shape, a subset of Geometric Forms (D_{10}) in Chu-style lacquerware, which is transformed into a broad and deeply enveloping armrest and backrest structure. Combined with robust square legs and outward-flaring armrests, the design cultivates a spatial atmosphere of stability and dignity, subtly alluding to the hierarchical order embedded in Chu culture. The Phoenix Pattern (D_1) is integrated across the backrest and seat cushion through a multi-layered Rotational Symmetry structure, creating a strong visual correspondence throughout the piece. Complemented by refined carving techniques along the edges, this scheme embodies the ornate and intricate decorative character distinctive of Chu-style lacquerware (Fig. 6).

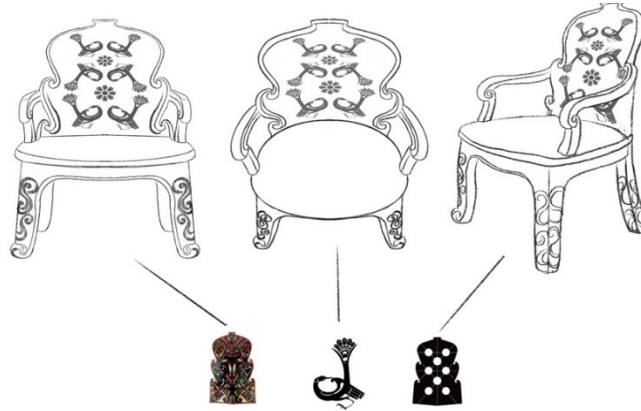


Fig. 6. Sketch design Scheme 3

Fuzzy Comprehensive Evaluation

In the process of transforming the cultural memes of Chu-style lacquerware into furniture design, evaluation indicators, such as “cultural heritage,” “design innovation,” and “aesthetic adaptability”, possess noticeable fuzziness and subjectivity. To avoid the biases caused by over-reliance on subjective experience in traditional design evaluation, the FCE method was employed. An expert panel was organized to conduct a quantitative comprehensive assessment of three alternative furniture design schemes.

- (1) Based on the previously established AHP model, the goal level set of evaluation indicators is defined as $U = \{B_1, B_2, B_3\}$, corresponding to the three cultural dimensions of material, behavior, and spirit, respectively. The evaluation set is determined as $V = (v_1, v_2, v_3, v_4, v_5)$, representing “Very Satisfied, Satisfied, Neutral, Dissatisfied, and Very Dissatisfied.” Additionally, the score vector for the evaluation levels is set as $E = (90, 75, 60, 45, 30)^T$.
- (2) This evaluation invited 20 experts from relevant fields, including 10 Chu-style lacquerware researchers, 5 product design professors from universities, and 5 potential consumers. The experts provided anonymous scores based on the performance of the three design schemes. Through normalizing the raw frequency data, fuzzy relation matrices were constructed for each scheme across the levels of Material Culture (R_1), Behavioral Culture (R_2), and Spiritual Culture (R_3). Taking Scheme 1 as an example, its constructed evaluation matrix is as follows:

$$R_1 = \begin{bmatrix} 0.25 & 0.45 & 0.20 & 0.10 & 0.00 \\ 0.30 & 0.40 & 0.20 & 0.10 & 0.00 \\ 0.20 & 0.50 & 0.25 & 0.05 & 0.00 \\ 0.25 & 0.40 & 0.25 & 0.10 & 0.00 \end{bmatrix} \quad (11)$$

$$R_2 = \begin{bmatrix} 0.25 & 0.45 & 0.20 & 0.10 & 0.00 \\ 0.30 & 0.40 & 0.25 & 0.05 & 0.00 \\ 0.20 & 0.45 & 0.25 & 0.10 & 0.00 \end{bmatrix} \quad (12)$$

$$R_3 = \begin{bmatrix} 0.30 & 0.40 & 0.20 & 0.10 & 0.00 \\ 0.35 & 0.35 & 0.25 & 0.05 & 0.00 \\ 0.25 & 0.45 & 0.20 & 0.10 & 0.00 \end{bmatrix} \quad (13)$$

- (3) The weighted average operator was adopted for multi-level operations. First, the evaluation vector for the sub-criterion layer was calculated as $B_i = W_{Bi} \times R_i$. Then, by combining the weights of the goal level, the comprehensive evaluation vector for Scheme 1: $W_1 = W_A \times [B_1, B_2, B_3]^T = (0.257, 0.436, 0.224, 0.083, 0)$. Finally, the score was calculated using $S = W \cdot E$. The comprehensive evaluation scores and results for each scheme were obtained in the same manner, as shown in the table below:

Table 16. Evaluation Weight Vectors for Each Scheme

Evaluation Object	Comprehensive Evaluation Vector W	Comprehensive Score S	Rank
Scheme 1	(0.257, 0.436, 0.224, 0.083, 0)	73.01	3
Scheme 2	(0.415, 0.406, 0.134, 0.045, 0)	77.87	2
Scheme 3	(0.574, 0.326, 0.100, 0.000, 0)	82.11	1

- (4) The calculation results indicate that Scheme 3 achieved a score of 82.11, significantly outperforming the other alternatives. In the explicit dimension, this scheme highly aligns with the visual characteristics of Chu-style lacquerware through the deconstruction and reorganization of phoenix patterns and lacquer shield forms. In the implicit dimension, its translation of the “Veneration of the Phoenix and Fire” totem received unanimous recognition from the expert panel. Consequently, establishing Scheme 3 as the core proposal for further design refinement is supported by substantial objective evidence.

Refinement of the Optimal Scheme

After establishing Scheme 3 as the optimal design direction, this study conducted further refinement across three dimensions—form and structure, material and craftsmanship, and pattern characteristics—to more fully convey the inherent cultural significance of Chu-style lacquerware factors. In terms of exterior form, the design preserves the sense of stability and dignified presence conferred by the geometric configuration of Chu-style lacquerware (D₁₀). Concurrently, through precise adjustment of the backrest support angle, seating comfort during prolonged use in modern contexts is enhanced, while the hierarchical order embedded in Chu culture remains subtly implied. Regarding material and craftsmanship, the overall chromatic intensity of the Red Tones (D₆) is carefully moderated, with black accents applied to select decorative areas, thereby restoring the warm, lustrous texture characteristic of traditional Decorative Techniques (D₁₉). In the treatment of decorative patterns, the Phoenix Pattern (D₁)—the core element traversing the backrest—and its underlying Rotational Symmetry (D₁₆) structure undergo modern geometric reinterpretation, shedding excessively figurative and superfluous details. Through this optimization process, the romantic belief system of “Venerating the Phoenix and Fire” (D₂₈) and the ornate decorative character of Chu culture are successfully translated into a formal language that aligns with the sensibilities of contemporary furniture design (Fig. 7).



Fig. 7. Final optimized design result

CONCLUSIONS

1. Drawing upon cultural memetics, this study deconstructs the complex art of Chu-style lacquerware into three cultural levels: the material level (patterns, colors, forms, and composition), the behavioral level (craft techniques, functional uses, and environmental context), and the spiritual level (shamanistic rituals, totemic worship, and life philosophy). These levels are further articulated into 29 specific evaluation indicators. The resulting cultural framework not only clarifies explicit visual factors, such as patterns, colors, and forms, but also reveals the implicit philosophical connotations underlying them. This approach offers a valuable point of reference for translating intangible cultural heritage into contemporary furniture design.
2. A scientific analytic hierarchy process – fuzzy comprehensive evaluation (AHP-FCE) design decision-making model was established to address the common challenge in traditional design practice of over-reliance on subjective experience, which often leads to the distortion of cultural characteristics. Through quantitative AHP analysis, this study identifies the high-priority weighting of core elements, such as the Phoenix Pattern, Geometric Forms, and Red Tones, within furniture design. Furthermore, the FCE method was applied to objectively evaluate the design schemes, effectively resolving the complex trade-offs among cultural inheritance, aesthetic adaptability, and functional practicality. This integration greatly enhances the scientific rigor of the design decision-making process.

3. The study achieves a living innovation of Chu-style lacquerware within modern furniture design, ultimately yielding three distinctive furniture schemes. Based on the comprehensive FCE scores, the optimal scheme was selected for further refinement and development. The practical application demonstrates that this evaluation system effectively guides the deep integration of Chu-style lacquerware elements with furniture design. The unified expression of visual identity and spiritual connotation in Scheme 3 received unanimous recognition from the expert panel. This research provides a replicable and quantifiable practical pathway for the living transmission of Chu-style lacquerware as intangible cultural heritage, offering considerable academic value and meaningful reference for design practice.

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