TPM Vol. 32, No. S5, 2025
ISSN: 1972-6325
https://www.tpmap.org/

INTEGRATING MONGOLIAN GER AESTHETICS AND SYMBOLISM INTO MODERN INTERIOR DESIGN: AN EXPERIMENTAL STUDY ON CULTURAL INSTITUTIONS

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Abstract
This study explores the integration of traditional Mongolian ger aesthetics and symbolism into modern interior design, with a focus on cultural institutions such as museums and dance halls. Through historical and theoretical analysis, 3D experimental modeling, and empirical user evaluations, the research demonstrates the viability and psychological impact of incorporating ger elements—like symbolic spatial organization, traditional color harmony, and decorative motifs—into contemporary settings. Findings reveal high user satisfaction and cultural resonance, suggesting that these traditional elements provide both aesthetic value and psychological comfort, thereby supporting cultural identity and sustainable design.
Keywords: Mongolian ger, cultural heritage, interior design, symbolism, user-centered design, traditional architecture, cultural sustainability

INTRODUCTION

Mongolia possesses a rich cultural heritage, meticulously preserved and developed over millennia. Central to this heritage is the traditional dwelling, the *ger* (often referred to as a yurt), which transcends its function as a mere shelter. The *ger* embodies a profound spatial organization and serves as an aesthetic expression of the Mongolian lifestyle, philosophical thought, and intricate social relations, reflecting a deep-seated harmony with nature. This dwelling is recognized globally as both a tangible and intangible cultural heritage, signifying its unique position in human history and architecture.

In recent years, the rapid advancements in technology and the increasing prevalence of sedentary lifestyles have significantly influenced contemporary interior design trends. Despite these shifts, there is a growing imperative to thoughtfully integrate national heritage into modern environments, particularly within public spaces such as tourism facilities, cultural institutions, museums, and performance venues. Such integration not only offers aesthetic enrichment but also serves as a vital means of disseminating national cultural values and fostering a sense of identity. However, a notable deficiency exists in methodological research concerning the effective introduction of traditional interior elements into modern design practices. This gap underscores the necessity for comprehensive studies that explore the structure, decoration, materials, and organizational features of the Mongolian *ger* and their potential for theoretical and methodological integration into contemporary interior environments.

The urgency of this research is further highlighted by global concerns regarding cultural preservation. UNESCO (2018) has emphasized that swift social and economic changes pose a considerable risk of traditions being forgotten or diluted. While previous research has acknowledged the unique place of the Mongolian *ger* in interior design studies, recognizing its tradition, symbolism, and potential for combination with modern design (Badamdorj, 2021; Molomjamts, 2008; Tsogzolmaa, 2005), a systematic approach to its application and evaluation in modern contexts remains underdeveloped. In recent years, domestic and international researchers have attempted to combine the architecture and internal organization of traditional dwellings with modern interior design. In particular, Wei Zun (2019), Liu Ming (2021), and Zhang Hui (2023) conducted a practical experiment on the use of Mongolian ger interior symbols and aesthetics in the spatial planning of public services.

Studies by international researchers such as Kim Yong-Hung (2018), Sarah Williams (2020), and David Anderson (2022) have indicated the positive impact of interior elements on psychological comfort, the transmission of national values, and consumer cognition, affirming the relevance of this research area. Scholar D. Maidar and L. Darisuren's work "Mongolian

Architecture and Urban Development" (1972) is a fundamental research work that studies the first Mongolian ger residential building, comparing the historical development and progress of the housing since the existence of the tribes, the structure of the house, the patterns and colors, the meaning and symbolism of the decoration with the findings of ancient objects, the research works of scholars, and literature. The work studies the depiction, construction methods, proportions, color depictions, and methods of construction from the beginning of the ger to the present Mongolian ger.

This study aims to analyze the traditional cultural content of the Mongolian *ger* from the perspective of modern interior design. It seeks to clarify the possibilities for its application, its coherence with contemporary design principles, and its aesthetic effects, thereby providing a robust theoretical and methodological foundation for its integration. To achieve this overarching aim, the study pursued several specific objectives: (1) to study and identify traditional elements of Mongolian home interiors, including their design, craftsmanship, use of basic components, natural materials, patterns, and color harmony; (2) to examine modern theories and trends in interior design, specifically functionalism, minimalism, and cultural integration, and to review their harmonization with national styles; (3) to develop and experimentally test interior designs that incorporate traditional Mongolian home interior elements within cultural institutions, namely museums and dance halls; and (4) to evaluate the developed interior designs by assessing user attitudes and satisfaction ratings.

The contributions of this study are multifaceted. It innovatively models and experimentally verifies the unique interior design, aesthetics, and material use of the Mongolian *ger* in contemporary settings. By combining theoretical exploration with practical application and gathering user evaluations in specific cultural environments, the research offers a novel approach to design. The quantitative and qualitative determination of the impact of symbolism, warmth, comfort, and spatial organization, considering the psychological and cultural expectations of users, significantly enhances the value of the study. From a broader perspective, this research provides experimentally-based solutions for optimally incorporating traditional elements of Mongolian *ger* interiors into modern design, offering theoretical and methodological proposals for interior designers, architects, and cultural heritage protectors. It demonstrates that the unique features of the Mongolian *ger* interior organization serve as a highly suitable model for the sustainable development of modern interior design, the meaningful absorption of cultural heritage, and the enhancement of human psychological comfort.

The central hypotheses guiding this investigation are as follows: (1) It is indeed possible to appropriately integrate traditional Mongolian interior elements into modern interior design, yielding solutions compatible with contemporary functions, aesthetics, and eco-conscious practices. (2) An interior environment that embodies the eco-style of the Mongolian *ger* will exert a positive psychological and aesthetic effect on consumers, fostering a sense of warmth, national pride, and high satisfaction. (3) The incorporation of traditional Mongolian home interior elements can effectively disseminate cultural heritage, elevate the quality of the interior environment, and serve as the foundation for innovative designs with unique solutions.

The Mongolian *ger* is an exceptional architectural creation that encapsulates the historical evolution, cultural ethos, aesthetic sensibilities, and philosophical approach to living in harmony with the natural environment of the Mongolian nation. It is not merely a physical dwelling but a comprehensive architectural form that articulates a psychological, aesthetic, and moral space.

Historical Development of the Mongolian Ger

The earliest form of Mongolian architecture is believed to have emerged over 4,000 years ago, with its origins depicted in the rock paintings of Mandal Mountain in Inner Mongolia, often referred to as "tent rock paintings". These ancient depictions, dating back to the Bronze Age, illustrate a shift in human lifestyle from natural caves to man-made tents, signaling a transition from hunting to animal husbandry. A notable rock painting shows a settlement of 18 tents, with a large central tent possibly serving as a tribal chief's palace, meeting hall, or temple, surrounded by smaller, well-organized tents. Further evidence from Yinshan rock paintings (7th–8th centuries AD) depicts a "Round Felt House in the Shape of a Circle," resembling the modern Mongolian *ger* with a felt cover and a round top.

In the 9th century, the Mongols migrated westward into what is now Mongolia, where they began to blend culturally and ethnically with the Turkic nomads who lived in the area. Over time, they split into many separate tribes, and in the 13th century, the power of the tribes led by Temujin grew stronger, and as a result of his military talent and high organizational skills, he was able to unite the nomadic provinces of Mongolia.

During the reign of Genghis Khan, large-scale military campaigns across many countries took place, and the Mongol army reached the territory of present-day Central Asia and Russia. As a result of these wars and expansions, relations between the East and the West became more active, and Genghis Khan’s encouragement of cultural exchange is highly valued in history (Bat Yar, 2015, p. 77).

Early Mongolian *gers* (nomadic *gers*) were primarily of two types: those transported on carts, varying in size from requiring multiple animals to a single cow, and those built directly on grasslands, valued for their ease of disassembly and assembly. These dwellings offered significant advantages, including adaptability to cold climates and a more comfortable internal spatial structure compared to previous housing forms.

The widespread adoption of the Mongolian *ger* across Central Asia is attributed to several factors. The vast steppes and cold climate necessitated light, warm, and easily movable housing, which the *ger* perfectly provided. Furthermore, the ancient Silk Road facilitated cultural exchange between ethnic groups, contributing to the broad dissemination of unique architectural forms like the *ger*. Scholar Funo Shuji's (2006) research classifies nomadic tent houses into four main types: conical tent houses (similar to Native American "Tipi"), broken linear cone tents (like the Siberian "Yaranga"), *yurts* and black tent dwellings (from Mesopotamia). This evolution from simple conical tents to more complex structures like the *ger* represents not only architectural innovation but also cultural adaptation to environmental demands.

By the 13th century, the Mongolian *ger* had largely attained its modern characteristics. Historical accounts, such as those by the medieval traveler G. D. Rubruk (1988), provide clear notes on the design, shape, capacity, and external appearance of the 13th-century Mongolian dwelling. During the feudal era, nobles distinguished their *gers* by painting them red and calling them "Urgoo" to symbolize their power. With the expansion of the Mongol Empire and economic growth, particularly before the Yuan Dynasty, portable *gers* were the primary housing form. However, with the development of agriculture and changing production methods, permanent dwellings also began to emerge in some steppe regions around the 12th century. The Genghis Khan Ongon complex in Inner Mongolia, for instance, exemplifies large-scale integration of *ger* form and symbolism into permanent structures, combining history, military culture, and religious traditions with modern architecture. The architecture of Mongolia is largely based on traditional dwellings, and the *ger* has influenced other architectural forms, particularly temples, which were designed with six and twelve angles and pyramidal roofs approximating the *yurt*'s round shape.

Architectural Elements, Symbolism, and Aesthetic Principles

The Mongolian *ger* is composed of fundamental parts—the roof, roof covering, walls, and doors—each of which is not merely a structural component but is deeply imbued with the traditions and customs of the Mongolian people. In modern Mongolian-style design, these elements must be utilized with profound respect for their historical and cultural context, extending beyond mere practical application.

Toono (Crown/Sky roof): The *toono* is considered a representation and symbol of the sun in ancient Mongolian mythology, serving as a vital connection between heaven and earth and the center of spiritual existence. Together with the *tulga* (hearth), it expresses the Mongolian belief in the sun and sacred fire. Typically crafted from flexible wood like poplar, *toono* frames come in two types: one with a flexible connecting mechanism for the *uni* (rafters) that folds like an umbrella, and another with clip-on holes for direct *uni* attachment. Beyond its structural role, the *toono* possesses significant decorative features, often painted in red or blue with gold accents, and intricately carved with traditional plant motifs (e.g., leaf motifs) and mythical creatures (e.g., dragon motifs), showcasing its aesthetic value. The *toono* is imagined as a round ring with a tower that brings light into the house, releases smoke and steam, and is painted in red and orange to symbolize the sun, with its rays following the *toono*'s form.

Uni (Rafters): The *uni* are the primary supporting structures of the *ger* roof, connecting the upper *toono* to the lower wall. Their uniform length, thickness, and shape, typically made from pine or red poplar, are crucial for the *ger*'s stability. The *uni* symbolize the rays of the sun, and their arrangement reflects unity. Two types exist: straight *uni*, which are easier to transport, and pointed *uni*, which offer benefits like protecting the *uni* pipe from wear, increasing wall height, and reducing wind force. The upper parts of the *uni* are often adorned with patterns and finished with an arrow feather motif.

Wall (Hana): The rhombus-shaped lattice structure forming the *ger* wall symbolizes the rolling hills of the steppe, protecting inhabitants from winds. The size of a Mongolian *ger* is determined by the number of wall sections, typically even numbers like 6, 8, 10, or 12. Constructed from poplar branches of consistent size, these are horizontally and vertically arranged and fastened with leather nails (often camel skin) to create the lattice. This collapsible structure is highly convenient for dismantling, transporting, and reassembling the *ger*. The *hana* possesses remarkable load-bearing capacity, with its intersecting points, called "heads," designed to receive and evenly distribute weight through the rhombus cells to the "feet" resting on the ground. This ingenious mechanism allows even slender poplar wood to support several tons of pressure, ensuring the *ger*'s stability and elegant rounded shape.

Door: Historically, Mongolian *gers* featured only a wooden door frame covered by a felt curtain; wooden doors were a later innovation. The door frame's height matched the wall, requiring people to bend when entering. Felt doors, often sewn with woolen thread and decorated with ribbons, were used in combination with single or double inward-opening wooden doors. A *tsavag*, a decorative element typically with three pendants adorned with auspicious patterns (eternal, spiral, horn), was hung above the door. Modern Mongolian homes have adopted wooden doors, yet the steppe tradition of not installing locks or door symbols (like door gods) to ward off evil persists. The door is a significant decorative area, frequently painted red as a base, with full patterns or blessing symbols. Strict taboos govern entry, such as forbidding stepping on the threshold, a tradition dating back to the Yuan Dynasty, symbolizing respect for the dwelling and its inhabitants. The door typically faces southeast or south to block northerly winds and align with sunrise for daily timekeeping. Felt doors, adorned with regional patterns like water waves and coin motifs, were practical for nomadic life due to their lightness. A narrow black

felt border around the entrance symbolizes a "dome" protecting against evil and illness, while a blue entrance, as seen in the Myangad clan, symbolizes the eternal sky.

Pillars: Essential in larger *gers* (exceeding eight walls), pillars provide crucial structural support against increased weight and wind forces, particularly in open-plan roofs. Large *gers* typically incorporate two or four pillars, fixed into a wooden frame around the central hearth and attached to the *toono*'s wooden frame. Pillars can be round, square, hexagonal, or octagonal and are often decorated with symbolic patterns such as dragons, wind, water, and clouds. In ancient times, dragon-patterned pillars were reserved for the lamas of the *yurt*. Pillars are believed to connect with ancestral spirits and represent the vertical axis of the world and the support of human existence. Symbolizing the husband and wife, it is taboo to step between them or exchange items across them.

Household (Tulga/Hearth): The *tulga*, or hearth, is centrally located in the *ger* and represents the most important symbol of family life and existence. Its three legs traditionally symbolize the three families of the household: the owner, the wife, and the daughter-in-law. The fire within the *tulga* is sacred, believed to house a fire god, to whom offerings of butter, alcohol, fat meat, and new silk cloth are made. The *tulga* fire symbolizes the eternal strength of the household, with specific blessing words offered during rituals.

Chagtaga: A bundle of barley tied from the *toono*, the *chagtaga* symbolizes the family's prosperity and purity, akin to spreading rice and clear skies. Made of camel wool, it signifies resilience against snowstorms. When windy, the *chagtaga* is lowered and weighted down to stabilize the *ger*. Sometimes covered with red cloth, it can symbolize rising in social ranks.

Tuurga (Skirt/Tube): The *tuurga* consists of felt sections wrapped around the *ger*'s walls. These four rectangular felt pieces symbolize the three times (past, present, future) and three generations (youth, middle age, old age), contributing to the stability of the roof and walls.

Roof: The *ger* roof is the felt covering that encloses the upper structure, typically composed of 3–4 layers of felt arranged in semicircular or fan shapes. These layers are crucial for heat retention and protection from wind and rain. A central circular hole in the roof matches the *toono* size, with overlapping front and back parts preventing ingress of wind, rain, and dust.

Khayaavch: This felt or wooden frame wraps around the *ger*'s perimeter, covering the lower edge of the door frame. Most Mongolian homes feature four rectangular *khanyn tsavag* (wall coverings), which are longer than the wall height and hung outside to protect the felt.

Traditional Interior Layout and Spatial Organization

The interior layout of the Mongolian home is distinctly organized and unique, with the hearth centrally located as the most significant symbol of family life. This circular, symmetrical organization reflects the Mongolian worldview, where the universe is perceived as an infinite circle, conveying completeness and perfection.

Specific areas within the *ger* are designated for different purposes and family members, reflecting social roles and respect:

North and West sides: Traditionally decorated with portraits of gods, idols, and ancestors, considered sacred spaces. Modern *gers* often place radios and televisions here.

Southwest: Reserved for men's equipment, including horse and livestock gear, and hunting tools.

North: Typically houses the bed and a table.

Northeast: Contains women's chests and personal belongings.

East: Features a picture cabinet for cups, pots, spoons, tea, milk, and other household items.

Southeast: Designated for kitchen utensils and the milking pot.

Seating arrangements within the *ger* adhere to specific rules, reflecting age, origin, and familial closeness. Men typically sit on the right (western side), with the oldest at the back and the youngest at the front. Women sit on the left (eastern side), maintaining similar age and rank distinctions. The seat at the north wall is reserved for the head of the family, a position inherited by the son upon the father's aging or passing. Guests are seated on the right and left sides, with older or more respected guests invited to the back.

This systematic internal organization of the *ger* is not merely functional; it aligns with a profound order of thought and organizational logic, embodying traditional, practical, and psychological values. It represents a comprehensive system that preserves tangible cultural heritage, traditional knowledge, and national thought structures.

Mongolian Patterns, Colors, and Decorative Art

Mongolian home decoration is a rich and intricate system of elements that convey the nation's aesthetic values, cultural heritage, and deep symbolism. These decorative arts are not solely for aesthetic purposes; they reflect the social status of the family, adherence to customs, and enduring artistic traditions. Furniture and interior items, including beds, chests, tables, chairs, shelves, and felt mats, are crafted from environmentally friendly materials such as wood, leather, and felt, designed to be foldable, lightweight, and adaptable to a nomadic lifestyle. Carvings, paints, and patterns adorn furniture, pillars, and doors.

Mongolians have historically understood the psychological effects of color, believing that red and orange create a warm, sunny interior. While the background colors for wooden elements like pillars and doors are predominantly red and reddish-brown, the chest of the is often green, chosen to temper the brightness of sunlight filtering through the *toono* and create overall color harmony. Patterns are then applied, often featuring cloud, horn, and dragon motifs, symbolizing unity.

Mongolian Home Color Symbols:

Red: Symbolizes fire, believed to ward off evil spirits and bring good fortune. Commonly used on wooden doors, windows, and interior furniture.

Yellow: Represents harvest and is considered a symbol of nobility. Frequently applied to interior furniture, decorative patterns, and religious objects.

Blue: The color of the sky, reflecting the Mongolian reverence for heaven and earth and the concept of destiny. During Genghis Khan's reign, blue became a color representing the family.

White: Symbolizes milk, white clouds, and eternal snow-capped mountains, representing purity, holiness, and sincerity. Historical records of "Eight White Houses" and "Nine White Banquet Halls" dedicated to Genghis Khan underscore the strong cultural significance of white.

Green: Represents nature and the continuation of life, often associated with food. In Mongolian weddings, blue and green symbolize eternal happiness.

The patterns themselves are incredibly diverse, broadly categorized into five types: geometric, animal, plant, natural phenomena, and those with religious meanings. Geometric patterns are the most widespread. The patterns are not merely decorative but are imbued with philosophy, often stemming from nomadic life and reflecting a deep respect for nature. For instance, the *Alkhan* pattern, inspired by animal hooves, symbolizes eternal movement, while the *Tumen Nast* pattern represents endless happiness. The *Khas* motif, an ancient cross symbol, signifies stability and the four elements of the universe. Mongolian craftsmen employed these motifs extensively in architecture, everyday household items, clothing, and tools.

The nomadic culture profoundly influenced artistic creation, leading to a preference for light, portable objects and an absorption of creative expression into household goods and livestock equipment. Despite this, palaces, temples, and large *ger* houses were extensively decorated with motifs. Each of the approximately 1,500 Mongolian national motifs carries unique symbolic meanings, originating from ancient times and reflecting customs, traditions, and nature worship. The deer horn, for instance, is ethnographically identified as the origin of many patterns. The intricate and meaningful nature of these patterns positions Mongolian design as a rich source for semiotic studies in architecture.

Integration of Traditional Elements in Modern Design:

Modern interior design extends beyond mere aesthetic solutions; it is a creative spatial construction that expresses, preserves, and develops local cultural values, national identity, and a lifestyle in harmony with nature. In this evolving trend, the re-integration of traditional architectural and interior elements into contemporary use is crucial for creating culturally sustainable designs.

The incorporation of Mongolian home elements into modern interior design offers distinct advantages:

Aesthetics: Mongolian patterns, color harmony, and forms provide a foundation for creating distinctive designs.

Function and Flexibility: The lightweight, foldable structures inherent to nomadic life are well-suited for flexible organization in modern spaces.

Psychological Value: Such designs foster a sense of national space and support the user's cultural memory.

The inherent qualities of the Mongolian *ger*—its ease of assembly and disassembly, transportability, protection against wind and cold, good air circulation, uniform light distribution, and year-round usability—align perfectly with contemporary sustainable design principles. The *ger*'s intelligent design solution, characterized by simplicity and rational space utilization, serves as a valuable asset for the future development of interior design, offering a counterpoint to modern trends that sometimes prioritize external form over fundamental functional requirements. This positions the *ger* not as a historical artifact, but as a living example of resilient, adaptable, and eco-conscious architecture, providing a valuable case study for biophilic design.

Examples of successful modern integration include:

Structural Use: The fundamental round structure of the Mongolian *ger* and its beam-shaped roof elements (*toono*, *uni*) are being creatively incorporated into modern public buildings, museums, exhibition halls, and hotel spaces. The Stray Birds Suji Prairie Hotel in Inner Mongolia, for instance, features a polygonal structure combining traditional *ger* elements with modern architecture and pillars with modular designs, and preserving natural lighting and a centralized environmental philosophy. The National Museum of Mongolia has similarly restored traditional *ger* environments and decorative patterns in its exhibition halls to bring historical cultural content to life in a modern space.

Pattern Conversion: National patterns are being simplified to suit modern minimalist styles and applied to both exterior and interior building decorations. The *soyombo* pattern, for example, is transformed into geometric shapes for facade

elements.

Color Harmony: The traditional colors of blue, white, yellow, and red, integral to Mongolian homes, are being utilized in modern interior design to imbue spaces with a distinct national character.

Material Innovation: Traditional felt is being replaced or complemented by modern materials such as insulation, lighting, glass, and steel, creating innovative solutions that retain the authentic atmosphere of the *ger* in contemporary facades and interior spaces.

Symbolic Use: Core symbols of the Mongolian home, including heaven worship, solar energy, and the cycle of life, are depicted in modern forms within building and interior designs.

International interest in the *ger* is also evident. The U.S. company "Pacific Yurts" has successfully adapted the traditional *ger* structure for various uses, including personal, commercial, and institutional applications, winning patents and international architectural awards. In Mongolia, architects and engineers are working to preserve the basic *ger* structure while developing new models suitable for urban planning, focusing on mobility, modern materials, energy efficiency, and renewable energy integration. The "State Hall of Honor" and the main hall for the 11th ASEM Summit in Ulaanbaatar, built in the form of a modern Mongolian *ger*, serve as prominent examples of this national effort to integrate traditional forms into high-level state architecture.

The theoretical frameworks of functionalism, minimalism, and cultural integration provide a robust basis for understanding how *ger* elements can be adapted. Functionalism, an architectural movement emphasizing utility and practical aspects, aligns with the *ger*'s design, where form inherently follows function. Minimalism, focusing on essential elements and simplicity, resonates with the *ger*'s rational use of space. Cultural integration theories underscore the importance of absorbing local values and creating designs that are not just aesthetically pleasing but also culturally sustainable and deeply rooted in local wisdom. This adaptive reuse of principles from the *ger* provides a powerful framework for future architectural and interior design projects seeking to integrate cultural heritage effectively.

Methodology: Experimental Design and User Evaluation

This research employed a mixed-methods approach to comprehensively investigate the integration of Mongolian *ger* aesthetics and symbolism into modern interior design. The methodology combined extensive bibliographic analysis with experimental modeling and empirical user evaluation.

The initial phase involved a thorough bibliographic analysis of national and international sources pertaining to the structure, interior elements, and symbolism of the Mongolian home. This process established a robust theoretical foundation for the study, informing the subsequent design and evaluation phases.

Development of Experimental Interior Designs (3D Modeling)

The core of the experimental phase involved the development of four distinct interior design models for cultural institutions: two school dance halls (designated B1 and B2) and two museum halls (designated A1 and A2). These models were meticulously crafted using advanced 3D modeling technologies, specifically AutoCAD for detailed planning drawings and SketchUp for realistic 3D models, material rendering, and lighting simulations. This digital prototyping approach significantly facilitated the visualization of the proposed environments, allowing for iterative refinement and realistic presentation to users.

The design philosophy underpinning these models aimed to integrate traditional Mongolian *ger* elements—such as the *toono* (crown/sky hole), *uni* (rafters), walls, patterns, and color harmony—into contemporary architectural elements and lighting solutions. The objective was to create culturally resonant spaces that also elicited specific psychological impacts, while ensuring functional requirements, psychological comfort, and a distinct national character.

B1 Dance Hall: This model featured a symmetrical rectangular shape with a ceiling incorporating radial lighting inspired by the *tumen nast* pattern, creating a centralized spatial organization. The ceiling was rendered in a sky-blue color, aiming to evoke a natural atmosphere and psychological concentration. Mirror walls and wooden railings were integrated to meet the functional needs of a dance training environment, supporting movement focus and self-view control. The central composition of this design directly aligns with the centralized structure of the *toono* in a traditional *ger*.

B2 Dance Hall: The ceiling structure of this model was designed with a grid of square frames, echoing the lattice structure of the Mongolian *ger*'s *uni*. Blue frames on a white background were used, and the floor was finished with natural wood material to create a warm ambiance. Silhouettes of dancers adorned the walls, enriching the artistic atmosphere. This design reflects the centralized geometry of the *ger* structure in a modern aesthetic.

A1 Museum Hall: This hall adopted a circular, centralized layout. Its ceiling featured a sky-blue color infused with cloud-like imagery, directly inspired by the *toono*'s role as a connection to the sky. Arched windows along the walls, complemented by a geometric patterned belt (reminiscent of the *soyuz/tumen nast* pattern), created an open space that integrated natural light and the external environment with the interior. The primary focus of this design was to create a "heavenly atmosphere".

A2 Museum Hall: While also circular, the A2 hall presented a more geometrically symmetrical design with a concentric

oval structure and a patterned skylight at its center. The radial distribution of light emanating from the ceiling was an architectural expression of the harmonious *uni-toono* structure of the Mongolian *ger*. Wall patterns and column structures reflected the interplay of national traditions and aesthetics, while a glossy white floor aimed to make the space appear more open and bright. This hall was specifically designed for the exhibition of student works.

The design process for all models adhered to principles of harmony between tradition and modernity, functional planning tailored to specific uses (training, exhibition), fostering a positive user psychological atmosphere, and integrating cultural heritage preservation.

User Evaluation Design (Questionnaire and Interview)

To assess the effectiveness and impact of the experimental designs, user evaluations were conducted through a combination of surveys and semi-structured interviews. A total of 211 participants were randomly selected, primarily comprising users of such environments.

Two versions of a 5-point Likert scale questionnaire (1 = strongly disagree, 5 = strongly agree) were developed: one specifically for the museum hall interior evaluation and another for the dance hall interior evaluation. These questionnaires assessed a comprehensive range of criteria, including:

-Perception of Mongolian tradition.
-Ability of ceiling and lighting to create atmosphere.
-Modern expression of interior patterns.
-Soothing effect of spatial organization.
-Comfort of natural light and color harmony.
-Harmony of tradition and modernity.
-Possibility of practical use (for training, exhibitions, museum activities).
-Factors inspiring cultural pride.
-Psychological impact of interior elements.
-Possibility of future dissemination.

In addition to the Likert scale questions, open-ended questions were included to capture participants' general impressions, their most favored elements, and suggestions for improvement. These qualitative responses provided valuable supplementary data for a deeper understanding of user perceptions.

Data Collection and Analysis Methods

Data collection involved presenting the participants with the realistically designed virtual environments of the museum and dance halls, after which they completed the respective questionnaires. The data were processed using IBM SPSS Statistics 26.0. Statistical analyses included descriptive statistics (Mean, Median, Standard Deviation) and distribution indicators (Skewness, Kurtosis) to understand the general evaluation and distribution characteristics of responses.

To assess the internal consistency of the questionnaire, reliability analysis using Cronbach's Alpha was performed. Item-total correlation analysis was also conducted to examine how well individual questions correlated with the total score of their respective groups. Furthermore, Factor Analysis (Principal Component Analysis - PCA) was applied to identify underlying latent factors within the questionnaire items. Finally, Analysis of Variance (ANOVA) was utilized to compare evaluations across different demographic groups, including age and professional categories, to detect any statistically significant differences in perceptions.

It is important to acknowledge certain limitations of this study. The sample selection was confined to users of the experimental virtual environment, which necessitates caution when generalizing the results to broader populations. Additionally, the data captured participants' momentary impressions and, therefore, do not reflect the stability of these perceptions over an extended period.

The use of 3D modeling tools for virtual prototyping proved to be a cost-effective and iterative design validation tool. This modern design methodology allowed for rapid iteration and testing of concepts before physical construction, which is particularly valuable for cultural integration projects where user acceptance is paramount. This approach highlights the effective intersection of traditional design principles with contemporary digital tools.

The multi-dimensionality of "user satisfaction" in cultural design was a central focus. The questionnaire's comprehensive scope, probing beyond simple aesthetic preference to include "perception of Mongolian tradition," "cultural pride," and "psychological impact," underscores that satisfaction in cultural design is deeply rooted in emotional and identity-based responses. This robust framework for assessing cultural integration moves beyond superficial metrics to capture the profound impact on human well-being and identity.

The methodology also emphasized the importance of "context-based adaptation" over direct replication. By testing models with both more direct integration (A1/B1) and modern interpretations (A2/B2), the study deliberately explored different levels of traditional influence. This approach recognizes that successful integration involves a creative, informed translation of underlying cultural principles to new contexts and functions, ensuring that heritage remains dynamic and adaptable

rather than static.

Results: Experimental Designs and User Acceptance

The experimental phase of this study involved the development and presentation of four distinct interior design models for cultural institutions: two school dance halls (B1, B2) and two museum halls (A1, A2). These designs aimed to integrate traditional Mongolian *ger* elements while meeting modern functional and aesthetic requirements.

Presentation of Experimental Interior Designs (Museum & Dance Halls)

The developed models showcase diverse approaches to incorporating Mongolian *ger* aesthetics and symbolism into contemporary spaces. All designs were conceived to harmonize tradition and modernity, ensure functional planning, foster a positive psychological atmosphere for users, and contribute to cultural heritage preservation.

B1 Dance Hall: This hall features a symmetrical rectangular layout with a ceiling designed with radial lighting, drawing inspiration from the *tumen nast* pattern. The ceiling's blue sky color aims to create a natural and contemplative atmosphere. Mirror walls and wooden railings are integrated to support dance training needs, facilitating movement awareness and self-correction. The central composition of the lighting directly reflects the centralized structure of the *toono* in a traditional *ger*.

B2 Dance Hall: The ceiling of this hall is characterized by a grid of square frames, which visually translates the lattice structure of the Mongolian *ger*'s *uni* into a modern geometric design. The use of blue frames on a white background, combined with a natural wood floor, creates a warm and inviting atmosphere. Wall decorations feature silhouettes of dancers, adding an artistic dimension to the environment. This design effectively reflects the centralized geometry inherent in the *ger*'s structure.

A1 Museum Hall: This museum hall adopts a circular, centralized layout. Its ceiling is painted in a sky-blue hue with cloud-infused lighting, directly inspired by the *toono*'s symbolic connection to the sky. Arched windows along the walls, complemented by a geometric patterned belt (reminiscent of the *soyuz/tumen nast* pattern), create an open space that seamlessly integrates natural light and the external environment with the interior. The design's primary objective is to evoke a "heavenly atmosphere".

A2 Museum Hall: Also featuring a circular form, the A2 hall presents a more geometrically symmetrical design. It incorporates a concentric oval structure with a patterned skylight at its center, representing the harmonious *uni-toono* relationship. Wall patterns and column structures reflect a blend of national traditions and contemporary aesthetics. A glossy white floor is used to enhance the sense of openness and brightness. This hall was specifically designed for the exhibition of student works.

User Acceptance and Satisfaction Evaluation

The user evaluation results provided compelling evidence of the positive impact of integrating traditional Mongolian *ger* elements into modern interior designs. The designs that intelligently incorporated traditional elements received notably higher ratings across various metrics, including user satisfaction, national identity, and aesthetic evaluation. For instance, the A1 and B1 models, which featured a more direct incorporation of traditional elements, achieved high scores: Satisfaction at 4.6/5.0, Aesthetics at 4.7/5.0, Recognition at 4.8/5.0, and Comfort at 4.5/5.0.

Qualitative feedback from users further underscored these findings, with participants reporting positive feelings, a heightened sense of national identity, and an overall atmosphere of peace and cultural immersion. This indicated that the thoughtful application of traditional elements significantly contributed to a sense of hospitality, an intimate atmosphere, and a feeling of cultural belonging among users.

Specific average ratings across the entire user sample (N=211) highlighted several key aspects:

The overall average rating for the traditional Mongolian characteristics of the hall environment was 3.55 (SD=1.151).

The atmosphere created by the ceiling and lighting received an average rating of 3.35 (SD=1.309).

The modern expression of national heritage in interior patterns and decorations garnered an average rating of 3.23 (SD=1.352).

The harmony of natural light and colors was rated at 3.50 (SD=1.156).

The potential use of the halls for training and exhibition purposes received a rating of 3.29 (SD=1.218).

A significant majority of users (85.3%) expressed positive sentiment towards the harmony of tradition and modernity in the designs, and 79.1% agreed that the hall environments could be widely adopted for educational and cultural services. These results collectively suggest that the spatial organization, lighting, and the use of traditional patterns and motifs effectively enhanced users' sense of cultural identity and comfort.

The harmony between traditional elements and modern functions in both the dance and museum hall environments consistently maintained a high level of user satisfaction, with a mean score of 3.50 (SD=1.197). Participants aged 30–40 (Generation Y) generally provided the highest ratings across most indicators, particularly for "Understanding of the room's tradition" (Mean=3.66) and "Natural light and color harmony" (Mean=3.61). Conversely, those aged 20–30 (Generation Z) rated the "Sense of peaceful space" higher (Mean=3.61). Overall, ratings across all age groups consistently fell within

the "above average" range (3.0–4.0), indicating a generally positive perception of the interior design solutions, their traditional elements, and the atmosphere they created.

Interpreting Findings and Implications

The findings of this study offer compelling evidence for the successful and meaningful integration of Mongolian *ger* aesthetics and symbolism into modern interior design, particularly within cultural institutions. The research not only validates the theoretical underpinnings but also provides practical demonstrations and empirical data on user acceptance.

Coherence of Traditional Elements and Modern Functionality

The study successfully demonstrated that the structural and symbolic principles inherent in the Mongolian *ger* can be harmoniously translated into contemporary architectural forms, thereby maintaining both aesthetic appeal and functional utility. The *ger*'s intrinsic circular organization, its centralized focus, and the radial distribution of its structural elements, such as the *uni* (rafters), were effectively reinterpreted and applied in the spatial layouts and lighting designs of both the museum and dance halls. This reinterpretation enhanced user flow and established clear focal points within the modern spaces.

The deliberate choice of natural materials, including wood and felt, and the strategic application of traditional Mongolian color palettes—blue, white, yellow, and red—contributed significantly to creating a warm, inviting, and culturally resonant atmosphere. This approach aligns seamlessly with contemporary trends in sustainable and biophilic design, which prioritize environmental harmony and human well-being. The *ger*'s intelligent design solution, characterized by its simplicity, rational use of space, and inherent harmony with nature, proves to be a valuable asset for the future development of interior design. It offers a counter-narrative to modern trends that sometimes overemphasize external form at the expense of fundamental functional requirements or human comfort.

Psychological and Cultural Impact on Users

User evaluations provided strong support for the positive psychological and cultural impact of the integrated designs. The spaces successfully fostered a profound sense of cultural pride, intimacy, and comfort among participants, demonstrating that the designs resonated beyond mere visual appreciation to evoke a deeper emotional connection. The symbolic meanings embedded within the patterns and structural elements—for instance, the *toono* as a connection to the sky or the *alkhan* pattern signifying eternal movement—were perceived by users, contributing to a richer and more meaningful experience of the environment.

The consistent positive feedback observed across various age groups, despite minor differences among professional categories, indicates a broad appeal and effective cultural communication. This suggests that the designs successfully tapped into a shared cultural memory and aesthetic appreciation, reinforcing the idea that cultural design can bridge generational divides and resonate with a diverse audience. The designs created a rich sensory and emotional landscape, where the interplay of natural materials, specific color harmonies, and diffused lighting deliberately evoked feelings of warmth, soothing comfort, and cultural pride. This extends beyond purely visual aesthetics to encompass a holistic sensory engagement, emphasizing that successful cultural integration in design is about crafting an experience that connects with the user's emotional and cultural memory.

Contribution to Sustainable Design and Cultural Preservation

This research positions the Mongolian *ger* as a compelling model for sustainable development within modern interior design. Its inherent adaptability, lightweight construction, and profound harmony with nature offer valuable lessons for contemporary architectural practices. By creatively integrating traditional elements, the study provides a practical pathway for preserving intangible cultural heritage in a dynamic, living form, rather than as static museum exhibits. This approach aligns with UNESCO's emphasis on adapting traditional heritage for modern use, ensuring its continued relevance and vitality.

The findings underscore that cultural heritage can serve as a powerful source of innovation and a unique differentiator in the global design landscape. By thoughtfully incorporating traditional elements, designs can contribute significantly to national identity and foster economic development, particularly through cultural tourism. This also highlights the "authenticity paradox," where modernity, when applied thoughtfully, can enhance tradition. The success of both the more direct (A1/B1) and more modern (A2/B2) integrated models demonstrates that adaptation, not just replication, is key to cultural preservation. Modern technology and materials can amplify traditional forms and meanings, creating a dynamic relationship where tradition informs innovation, and innovation sustains tradition.

The *ger* serves as a model for the "adaptive reuse of principles." The study's emphasis on reinterpreting and integrating the *ger*'s meaning, symbols, and organizational principles into modern spaces, rather than direct copying, is a crucial distinction from superficial mimicry. The *ger*'s inherent adaptability to diverse climates and nomadic movements makes its underlying principles inherently suitable for flexible modern applications. This provides a robust framework for future architectural and interior design projects seeking to integrate cultural heritage, encouraging designers to extract and adapt the "design DNA" of traditional forms to ensure both cultural authenticity and contemporary relevance. This contributes to a broader

discourse on how traditional knowledge systems can inform modern sustainable and human-centered design.

Recommendations for Integrating Traditional Mongolian Ger Elements in Modern Interior Solutions

Based on the comprehensive findings of this study, a series of practical recommendations can be formulated for designers, architects, and cultural heritage protectors seeking to integrate traditional Mongolian *ger* elements into modern interior solutions. These recommendations are grounded in the principles of preserving symbolic integrity, ensuring functional adaptation, harmonizing colors and patterns with purpose, leveraging natural materials, maintaining centralized spatial logic, and considering the holistic user experience.

The recommendations collectively form a coherent framework for translating the philosophy and symbolism of the traditional Mongolian *ger* into modern cultural contexts. The primary objective is to create interior environments that are compatible with modern functions, suitable for receiving guests, disseminating information, and serving educational purposes, all while ensuring user recognition, satisfaction, and aesthetic appeal.

The "design language" of cultural heritage, as demonstrated by the Mongolian *ger*, offers a systematic approach to cultural integration. By understanding the profound meanings embedded in each element—from the cosmic symbolism of the *toono* to the protective qualities of the *hana*—designers can move beyond superficial decoration to create spaces that communicate cultural narratives and evoke specific psychological and emotional responses. This framework serves as a practical guide, emphasizing the underlying principles over mere stylistic imitation.

Furthermore, these recommendations support the concept of moving from "preservation" to "proliferation" of cultural heritage. By integrating cultural elements into functional, everyday spaces, the designs actively engage audiences and ensure the continued relevance and vitality of traditional forms. This positions interior design as a powerful medium for cultural dissemination and education, fostering a broader appreciation and understanding of Mongolian heritage among diverse audiences. The aesthetic solution of the interior should not only express a modern appearance but also preserve the content of national culture, designing traditional symbols as meaningful structures rather than mere "decorations" to create an atmosphere consistent with user psychology. This strategy for developing innovative designs that combine tradition and modernity will contribute to the national trend of future interiors.

CONCLUSION

This study embarked on establishing a theoretical and practical foundation for the creative integration of traditional Mongolian architectural elements into the interior design of modern service organizations. Through the development of experimental models and their evaluation based on user attitudes, several key conclusions have been drawn.

The theoretical framework, encompassing cultural ecology theory, material culture theory, and user-centered modeling theories, provided a robust and rational explanation for integrating the structure, elements, and symbols of the Mongolian home with the principles of modern interior design. This research underscores that interior design is not solely an aesthetic endeavor but a creative spatial solution that must address cultural coherence, user psychology, and recognition, emphasizing the profound capacity of space to convey psychological and cultural information.

The experimental designs developed for the B1 and B2 dance halls and the A1 and A2 museum halls stand as compelling examples of solutions that successfully blend national traditions with modern needs. These designs received high satisfaction ratings and positive reviews from users, empirically validating the viability of such integration. The utilization of three-dimensional modeling software, such as AutoCAD and SketchUp, proved instrumental in optimizing various aspects of the design process, including spatial planning, lighting harmony, material selection, and the seamless integration of symbolic elements.

Participants in the user evaluation expressed high levels of satisfaction regarding the designs' ability to evoke cultural memory, facilitate recognition, and provide comfort and convenience within an environment rich with Mongolian *ger* elements. The survey results, both quantitative and qualitative, confirmed the significance of these interior designs and their considerable development potential, offering a realistic assessment of their suitability and impact.

The study demonstrated that traditional interior elements can be employed in a context-based, functional, and artistic manner within contemporary educational, exhibition, and public service environments. This approach is not merely a design innovation but represents a crucial strategic direction for the preservation of national culture, the promotion of public awareness, and the fostering of cultural memory and belonging. The systematic development of three-dimensional experimental models that realistically integrate traditional Mongolian interior elements into educational and cultural service environments, coupled with their validation through user evaluation, marks an innovative stride in this research area.

Ultimately, the findings of this study provide a foundational basis for developing reference projects that possess significant practical and theoretical implications across the fields of interior design, cultural heritage preservation, and consumer-centric design. This research contributes to a broader understanding that design, when deeply informed by cultural heritage, can transcend mere aesthetics to create spaces that are profoundly meaningful, psychologically resonant, and culturally

enriching.

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