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Exploration of Character Design for the Development of The Millennium Robot Toys

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ABSTRACT

This research investigates character design principles for millennium robot toys, with a focus on the impact of aesthetics, personality, interactivity, and emotional engagement on their appeal and functionality. The study aims to provide design guidelines that enhance user experience and educational value. Employing a quantitative approach, the research measures user preferences, reactions, and perceptions of character design elements through surveys, controlled experiments, and statistical analysis.

The methodology is divided into three key components: (1) Survey-Based Research: an online survey will collect quantitative data from a diverse sample, including children (the primary users), parents, toy designers, and educators, to assess preferences for various design elements (e.g., color, shape, size, personality traits, interactivity). (2) Experimental Design: controlled experiments will be conducted using robot toy prototypes with varying design features (e.g., color, shape, personality) to evaluate user interaction and emotional engagement in a controlled environment. (3) Data Analysis: quantitative data from both the survey and experiments will be analyzed using statistical methods to identify trends and correlations between design features and user preferences. Descriptive statistics (mean, median, mode) will be used to determine the most favored design elements.

Key findings include: (1) Four super robots, including B. Gaita and D. Unicorn Gundam, were the most recognizable, receiving 43.12% and 28.44% positive ratings, respectively, demonstrating a continuous evolution in public aesthetics. Both exhibit a roughness reminiscent of toy accessories and prioritize realism in design. (2) Among survey respondents, toy accessories emerged as a primary concern, with a strong demand for innovative toy accessories, reflecting contemporary preferences for armed robots over the unarmed fighting of previous eras. (3) No significant distinction was found between darker and lighter tones; however, blended colors accounted for 40.37% of the sample, contributing to a more dynamic and diverse color palette. The design of super robots reflects a delicate balance between realism and idealism, embodying both scientific fantasy and human aspirations. These creations serve as more than just functional machines; they represent an artistic expression that inspires and captivates audiences. The evolution of robot animation has been integral to the genre's growing fanbase, with China experiencing both the proliferation of unofficial model toys and a recent shift toward officially licensed products. Despite challenges in production quality, the enduring appeal of super robots ensures their continued presence and significance in both creative and commercial realms.

Keywords: Character Design, The Millennium, Robot Model, Art Toys

Introduction

Previously the realm of science fiction, they have now become a fundamental component in contemporary families and educational environments. The transition from wind-up mechanical toys to sophisticated AI-driven robots reflects the swift progress in robotics and artificial intelligence. The worldwide toy business has adopted this change, with robot toys fulfilling dual functions: amusement and education. This article examines the evolution of robotic toys, emphasizing their transition from rudimentary devices to sophisticated systems, and their role in fostering learning, creativity, and social engagement.

Hero veneration is a deeply rooted cultural practice throughout human history, ranging from ancient mythological figures to modern military heroes. These figures have played a critical role in inspiring and motivating individuals to face significant challenges. In contemporary society, as people confront increasingly complex obstacles, such as natural disasters and social conflicts, the need for heroic figures remains strong. The Super Robot concept emerges from the historical tradition of war hero reverence and is closely linked to science fiction narratives surrounding human industrial advancement (Napier, 2005). The aim of this study is to explore and reinterpret the heroic ideals of the past century within the framework of modern cultural production. Superheroes such as Superman and Captain America, widely considered two of the most iconic figures globally, have been deliberately crafted to embody either the archetype of a war hero or the overwhelming forces of nature. Across centuries of cultural production, they have been portrayed as guardians of justice, with their depictions evoking a sense of righteousness, grandeur, and strength. In today's complex global environment, marked by a diverse array of challenges facing humanity, superheroes continue to offer individuals a sense of solace and inspiration.

Following the Industrial Revolution, humanity entered the era of steam power, giving rise to a new form of aesthetic appreciation centered on artificial artifacts. This period marked a significant shift from the veneration of nature to the veneration of human ingenuity. As a result, the visual appeal of industrial machinery has become a prominent focus in contemporary art and design. A design solution that seamlessly merges industrial aesthetics with heroic symbolism is embodied in the concept of the super robot. Robot animation emerged as a cultural phenomenon within Japan's left-wing movement, arising from the movement's limitations, which prompted individuals to channel their aspirations into artistic innovation (Craig, 2000). As a result, robot animation developed with a strong anti-authoritarian inclination. Due to its significant commercial success, the thematic elements of robot animation gradually became intertwined with traditional Japanese culture, evolving alongside advancements in technology and cultural development. Undeniably, robot animation represents a core component of the Anime industry, and its trajectory mirrors key stages of Japan's economic growth. Rooted in tangible societal realities, it has followed a distinct cycle of inception, growth, peak, and decline.

Akurasu Wiki. (2024) launched the information of main characters in the 1977 television series "Super Electromagnetic Hero Voltes V" eventually came to realize that the root cause of conflict was a corrupt, authoritarian government, leading them to take control of their own destiny. Due to its strong anti-discrimination and anti-dictatorship themes, the series was banned for a decade by the Marcos dictatorship in the Philippines, a move that later contributed to the famous Aquino uprising. This animated series holds national significance in the Philippines. In 2024, the Philippines debuted a new live-action feature film titled Super Electromagnetic Hero Voltes V-Heritage, a reimagining of the original Voltes V series, as shown in Figure 1.



Figure 1. Super Electromagnetic Hero Porugis V-Heritage

Research problems

What are the key design principles that can enhance the interactivity and user experience of millennium robot toys?

Research objectives

This research aims to explore character design principles for millennium robot toys, focusing on how aesthetics, personality, interactivity, and emotional engagement influence their appeal and functionality, while providing design guidelines to enhance user experience and value added to the toys manufacturer.

Literature review

Robot toys have existed since the early 20th century, with the first mechanical robots appearing in the 1920s and 1930s. These early toys were basic, often relying on wind-up mechanisms or simple electronics to simulate movement. One of the most iconic examples is the 1950s "Robbie the Robot" toy, based on the character from the science fiction film Forbidden Planet. These early iterations were more a novelty than an educational tool, offering a glimpse into the futuristic world of robots (Brown, 2021).

In the 1980s and 1990s, the first generation of programmable robot toys emerged. Toys like the Big Trak (1979) and LEGO Mindstorms (1998) introduced children to the basics of programming and robotics. These toys marked the beginning of a shift toward interactive, educational play, as they allowed users to engage with the underlying technology. However, the complexity of robot toys was still limited by the available technology at the time, with basic motors and sensors offering a narrow range of interaction.

Technological Advancements in Robot Toys With the 21st century came a wave of technological innovations that transformed robot toys into more interactive and intelligent systems. Key technological advancements have included:

1. Artificial Intelligence (AI) and Machine Learning

AI has had a profound impact on the capabilities of modern robot toys. The integration of machine learning allows these toys to learn from user interactions, adapt their behavior, and provide a more personalized experience (Wood, 2020). For example, Anki Cozmo (2016) and Vector (2018) are examples of toys that can recognize faces, respond to voice commands, and interact autonomously with

their environment. AI enhances the ability of toys to simulate life-like behaviors, fostering deeper engagement.

2. Natural Language Processing (NLP)

Another key advancement is the implementation of natural language processing in toys, enabling voice-based interaction. Products like Woobo (2017) and Sphero RVR (2019) allow children to communicate with their robot companions using natural speech, turning toys into conversational partners. This not only enhances the play experience but also introduces children to emerging technologies in AI-driven communication.

3. Sensor and Actuator Technologies

Modern robot toys use sophisticated sensors and actuators to interact with their surroundings. Infrared, ultrasonic, and optical sensors allow toys to detect obstacles, measure distances, and respond to environmental stimuli. The development of more sensitive and accurate sensors has facilitated the creation of robots that can exhibit complex behaviors, such as navigating obstacles or mimicking emotions. For instance, Sony Aibo (2018) employs advanced sensors to mimic the behavior of a real dog, learning from user interactions and evolving over time.

4. Connectivity and IoT Integration

The Internet of Things (IoT) has extended its reach into the realm of toys, with many modern robot toys being equipped with Wi-Fi or Bluetooth connectivity. This allows them to update their software, download new features, and connect to other devices. Toys like Sphero's BB-8 and LEGO Boost use IoT to enhance their functionality, offering new ways to play through companion apps. Connectivity also enables collaboration between toys, as seen in programmable robots that can work together to complete tasks or solve problems.

5. Educational Potential of Robot Toys Robot toys have transcended traditional play to become powerful tools for education. These toys can teach children the basics of coding, robotics, engineering, and even artificial intelligence (Chambers, 2018). Products like LEGO Mindstorms, Osmo Coding Jam, and FurReal Friends combine hands-on play with digital interaction, introducing children to critical thinking, problem-solving, and collaborative skills.

6. STEAM Learning

STEAM (Science, Technology, Engineering, Arts, and Mathematics) education is increasingly integrated into the design of robot toys. Dash and Dot by Wonder Workshop and Makeblock's mBot are popular tools for teaching children coding and robotics in a playful, accessible way (Chambers, 2018). These toys often come with programmable features, allowing children to design and control robots while developing coding skills. By encouraging experimentation, robot toys can inspire a passion for STEM fields from an early age.

7. Emotional and Social Development

Some robot toys, particularly those that simulate human or animal behavior, contribute to emotional and social development. Leka, a robotic companion for children with developmental disabilities, helps improve social skills through interactive play. Robot toys designed to foster empathy and communication, such as TOMY's i-Sobot, are increasingly being used as therapeutic tools in healthcare settings.

Technological advancements in robot toys have revolutionized their interactivity, intelligence, and educational value. The integration of AI, machine learning, and natural language processing allows for more personalized and lifelike experiences, while sensors and IoT connectivity enhance responsiveness and adaptability. These innovations have transformed robot toys into powerful educational tools, promoting STEAM learning, coding, and robotics skills in an engaging way. Moreover, robot toys contribute to emotional and social development, particularly for children with developmental challenges, offering not only entertainment but also therapeutic benefits, this will be a main design factor. As technology continues to evolve, robot toys will likely play an even greater role in education and emotional well-being. Challenges and Future Directions Despite the numerous advancements, the

development of robot toys is not without its challenges. One significant concern is data privacy, particularly for toys that connect to the internet or store personal information. As these toys become more advanced and integrated into daily life, ensuring the safety and privacy of users, particularly children, is paramount.

Moreover, the cost of advanced robot toys remains a barrier for many families and educational institutions. While prices are decreasing as technology becomes more accessible, high-end AI-powered toys still tend to be expensive.

Looking to the future, robot toys will likely continue to evolve in line with advances in AI, machine learning, and robotics. We can expect further improvements in interactivity, autonomy, and educational content, with toys increasingly blurring the line between entertainment and learning.

Research methodology

This research will employ a quantitative approach to objectively measure user preferences, reactions, and perceptions regarding character design for millennium robot toys. The methodology will focus on gathering numerical data through surveys, controlled experiments, and statistical analysis to draw conclusions about the most effective design elements.

1. Survey-Based Research

A structured online survey will be designed to gather quantitative data from a large sample of participants, including children (the primary users), parents, toy designers, and educators. The survey will focus on assessing preferences for various character design elements such as color, shape, size, personality traits, and levels of interactivity.

Objective: To measure the preferences and expectations of users regarding key design features in millennium robot toys.

Sample Size: Approximately 200-400 respondents, stratified by age (children aged 7-14), gender, and user type (parents, toy designers, educators).

Survey Instrument: A Likert scale will be used to rate design features (e.g., 1 = Strongly Dislike, 5 = Strongly Like). Multiple-choice questions will assess design preferences, and demographic data will be collected for comparison.

Data Collection Tool: Online survey platforms (e.g., Google Forms, Qualtrics).

Example Survey Questions:

On a scale of 1-5, how important is the character's color in influencing your interest in a robot toy?

Which personality traits do you prefer in a robot toy? (Multiple options: Friendly, Serious, Playful, etc.)

How much do you value voice interaction in robot toys? (Scale: 1-5)

2. Experimental Design

Controlled experiments will be conducted to evaluate how different character design variables affect user interaction and emotional engagement with robot toys. Several robot toy prototypes with varying design features (e.g., different colors, shapes, personalities) will be developed and tested in a controlled environment.

Objective: To measure the impact of specific design elements on user engagement and satisfaction.

Sample Size: 100 participants (children aged 7-14), divided into groups based on exposure to different robot toy prototypes.

Variables:

Independent Variables: Design features (color, shape, personality, interactivity).

Dependent Variables: User engagement (time spent interacting with the toy), emotional response (measured through surveys), and satisfaction (post-experiment Likert scale rating).

Data Collection Tool: Observation and user interaction tracking (e.g., using time-tracking software to measure engagement duration), post-experiment surveys for emotional response and satisfaction.

Experimental Procedure:

Participants will be randomly assigned to interact with one of the robot toy prototypes.

Each interaction session will last for 15-20 minutes, and user engagement will be recorded.

After the session, participants will complete a brief survey rating their experience with the robot toy on aspects like enjoyment, engagement, and emotional connection (e.g., How much did you enjoy playing with the robot? Rate on a scale of 1-5).

3. Data Analysis

The quantitative data collected from the survey and experiments will be analyzed using statistical methods to identify trends, patterns, and correlations between different character design features and user preferences.

Descriptive Statistics: Mean, median, and mode will be calculated for survey responses to determine the most favored design elements.

Correlation Analysis: Pearson's correlation coefficient will be used to assess the relationship between different design features (e.g., personality traits, interactivity) and user satisfaction or engagement levels.

ANOVA (Analysis of Variance): This will be used to compare user satisfaction across different groups exposed to varying character designs, to determine which design features have the most significant impact.

Regression Analysis: To predict which design elements (e.g., color, interactivity) are most likely to lead to higher levels of user engagement and satisfaction.

Findings

Table 1. The identification of the super robot classifications

Robot Name	Percentage (%)
A. Mazinger Z	18.35%
B. GAITA	43.12%
C. Genzu GUNDAM	10.09%
D. Unicorn GUNDAM	28.44%

The four most recognizable super robots are B. Gaita and D. Unicorn Gundam, which received 43.12% and 28.44% positive ratings, respectively. It is noteworthy that both were developed in close temporal proximity, indicating a continual evolution in public aesthetics. Simultaneously, both super robots have a roughness akin to actual toy accessories and a design aesthetic that prioritizes realism.

Table 2. The identification of appealing components of the super robot

Robot Components	Percentage (%)
A. Head styling	3.67%
B. Armed Forces Used	55.05%
C. Trunk part	30.28%
D. Limb parts	11.01%

Among the responses from all polled individuals, B. Armed Force Used is toy accessories emerged as the paramount concern; specifically, the invention of innovative toy accessories that might captivate attention was deemed highly significant. The contemporary era exhibits a significantly greater demand for toy accessories, in contrast to the previous era, which was characterized by unarmed fighting.

Table 3. The identification of color scheme of the super robot

Robot Color Scheme	Percentage (%)
Plain color system, mainly consisting of any single color	12.84%
Dark color scheme, mainly black, gray, etc.	19.27%
Mix color scheme to maximize color representation	40.37%
Light color scheme, mainly blue, white, etc.	27.52%

The analysis revealed no significant distinction between darker and lighter tones. However, blended colors accounted for 40.37% of the sample, contributing to the development of a more dynamic and diverse color palette.

Conclusions and Discussion

In examining the design aesthetics of super robots, this study analyzed the key characteristics of the previous surge in robot animation and synthesized their design trends (Smith, 2017). In contrast, it also considers the artistic considerations necessary when creating visuals informed by contemporary aesthetics. This outcome supports the research objective about the essential characteristics of aesthetics, personality, interactivity, and emotional involvement. Historically, the depiction of robotic art was constrained by the traditional portrayal of justice heroes, who were often designed to resemble humans more closely than machines (Kato, 2018). These figures typically avoided the use of toy accessories, and their physiques mirrored the idealized forms of robust individuals, reminiscent of ancient Roman sculptures, with muscular builds akin to bodybuilders (Tanaka, 2020).

However, in recent years, social transformations and evolving human aesthetics have shifted public interest toward designs that reflect more authentic military forms and actions. This trend has influenced robot designs to incorporate mechanical elements, such as tanks and armored vehicles, with contemporary robots increasingly resembling military hardware. Cannons and rifles, for example, are instinctively recognized as offensive toy accessories in modern cognition, and their inclusion enhances the association of these robots with toy accessories. Key design elements that led the Development of the Millennium robot toys as are 1) GAITA: is the identification of the super robot classifications 2) The identification of appealing components of the super robot is: Armed Forces Used 3) The identification of color scheme of the super robot is: Mix color scheme to maximize color representation, as shown in Figure 5.

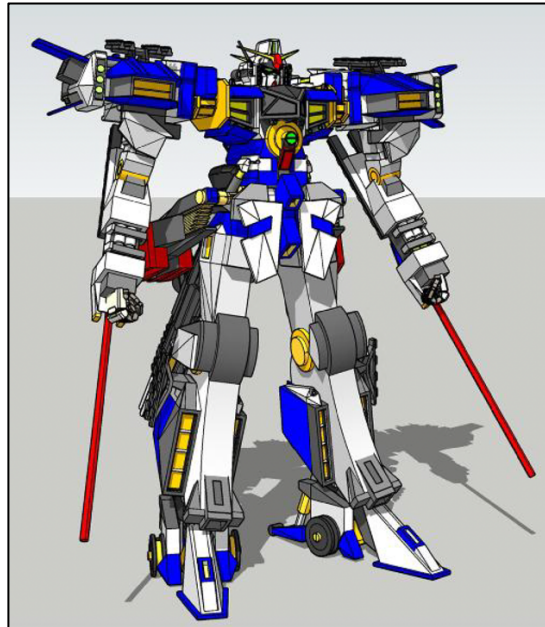


Figure 2. Robot toy prototypes

The primary consideration in the design of super robots remains the balance between realism and idealism. Super robots exist within the realm of scientific fantasy and do not conform to practical value in the real world. Instead, they represent an aesthetic and spiritual ideal that resonates with humanity's need for inspiration. Thus, their design transcends mere functionality, reflecting a fusion of fantasy and artistic expression.

Robot animation can be considered one of the earliest forms of animation, emerging during the initial phases of the medium's rebirth. Consequently, its fanbase has been steadily growing since the advent of animation. Over the past two decades in China, stagnation in international trade has contributed to the proliferation of illegally produced model toys, largely due to limited awareness of copyright issues. For many individuals, their first encounter with robots came through these unofficially produced toys. However, with increased awareness of intellectual property rights, these toys have reemerged in the Chinese market as officially licensed products. Although the manufacturing process of these models remains relatively coarse, often incorporating soft rubber components, the selection typically focuses on highly popular robots with distinctive features to cater to a broad market.

In China, a range of model markets exists, from upscale to lower-end channels. Some models are officially sanctioned, while others are produced without authorization. Unauthorized manufacturers often attempt to create their own designs, either through original concepts or by drawing inspiration from exceptional designs found online. As a result, robot model toys can be promoted through both premium and budget markets. Low-end markets often require only basic model outlines, while high-end markets demand more intricate designs, including detailed internal frameworks.

The market for robot models is further bolstered by the fact that many individuals who grew up during the golden era of robot animation in the 1990s are now entering middle age, with increased disposable income to invest in their hobbies. As a result, consumers are now more inclined to invest in products that evoke nostalgia (Puenpong, 2023), contributing to a domestic market that has grown by

more than 30% annually. Industry reports predict that by 2023, the market for model toys will surpass 9 billion yuan. This indicates that the study of robot animation and its associated merchandise holds substantial commercial potential, with both artistic and economic value, making it a promising area for further development.

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Creative Tourism through Thai Handicraft Village A Case Study of “Mae Khiaew Khong Louang”

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ABSTRACT

This investigation sought to examine the management of the group. It also sought to examine the feasibility of establishing it as a tourist attraction. It sought to establish guidelines. The rules will facilitate the development of the bamboo weaving group. They will promote creative and sustainable tourism. This study is qualitative in nature. The researcher has examined studies and pertinent documents. Data was acquired through interviews. The demographic cohort comprises individuals. Bamboo basketry handicraft collective "Mae Khiaew Khong Louang".

The results were as follows: This artisan group is located approximately 20 kilometers from Chiang Mai city. Accessible transportation. No homes or community facilities currently exist. A maximum of 30 to 40 travelers may be accommodated daily. The initiative should commence with educating the handicraft group and stakeholders on creative tourism. This will transform it into a creative tourism destination. Arrange space and facilities in accordance with the native culture. Facilitate engagement between cultural proprietors and attendees. Restrict the visitor count to the capacity that allows for comprehensive care. Generate awareness by supplying information for tourists to facilitate their decision-making on visitation. Devise tourism activities that facilitate visitor engagement. These operations aim to retain current tourists and attract new ones through public relations efforts. Regulate tourist quality and enhance it without altering the community's lifestyle. Society and culture to enable handicraft groups to achieve independent development.

To establish the Mae Khiao Khong Luang group as a creative tourism destination, a focused approach is recommended that prioritizes education on sustainable tourism practices among the group and stakeholders. Organizational strategies should reflect local cultural authenticity, integrating designated spaces for meaningful artisan-tourist interactions while regulating visitor numbers to align with community capacity. Promoting awareness through targeted public relations and designing engaging activities can support visitor interest while preserving the community's lifestyle. Sustainable tourism planning would further benefit from quality control practices to safeguard cultural integrity, ensuring that economic, social, and environmental impacts are balanced to foster long-term growth and self-sustainability for the handicraft group and surrounding community.

Keywords: Creative Tourism, Thai Handicraft Village, Mae Khiaew Khong Louang

Introduction

Creative tourism is an innovative approach to travel that goes beyond traditional sightseeing, inviting travelers to immerse themselves actively in local culture, skills, and traditions. Unlike typical tourism, which often focuses on observing a destination's highlights, creative tourism emphasizes participation, learning, and personal expression. Travelers might take a cooking class with local chefs, learn traditional arts like pottery or weaving, or engage in workshops led by artisans. By creating something themselves, visitors gain deeper insights into the cultural and artistic heritage of a place,

forging authentic connections with local communities. Richards (2011) discusses how the tourism sector has evolved to embrace creative experiences, moving beyond the passive consumption of cultural heritage toward an interactive, experience-based model. Richards explains that this shift aligns with broader trends in the "experience economy," where the demand for novel, participatory activities has risen. He argues that creative tourism adds value by enabling tourists to co-create experiences, which builds a deeper connection with destinations and local communities. This approach reflects a response to the oversaturation of cultural tourism offerings, aiming to provide unique, harder-to-replicate experiences by involving tourists in workshops, performances, and creative learning activities.

This hands-on style of travel has gained popularity in recent years as travelers seek more meaningful, memorable experiences. Creative tourism not only enriches visitors but also benefits local communities by supporting local artisans, preserving cultural heritage, and fostering cross-cultural exchanges. As a result, creative tourism has become an increasingly valued form of sustainable travel, offering unique, interactive experiences that encourage cultural appreciation and responsible engagement.

Thai handicraft represents a distinctive fusion of aesthetic tradition, cultural significance, and technical mastery, often reflecting the unique social and spiritual values of Thailand. Each region in Thailand boasts specialized crafts: Northern artisans are known for silk weaving and umbrella making, Central regions excel in bronze and silverware, while Southern provinces produce sophisticated wood carvings. These crafts are usually passed down through generations, preserving techniques and motifs that date back to Thailand's earliest civilizations. Moreover, Thai handicrafts have played an essential role in sustaining local economies, especially in rural areas, providing income and a means of cultural expression. Scholars note that Thai artisans often imbue their work with symbolism, such as patterns inspired by Buddhist teachings or depictions of mythological creatures, emphasizing harmony, balance, and prosperity. Recently, the global appreciation for sustainable, handcrafted goods has fueled interest in Thai handicraft, leading to renewed efforts to protect and promote these art forms, thereby safeguarding Thai cultural heritage against the pressures of industrialization and modernization.

Research problems

What is the key factor that can enhance the creative tourism through Mae Khiaew Khong Louang Handicraft Village?

Research objectives

This research aims to explore identity of Mae Khiaew Khong Louang Handicraft Village, focusing on creative tourist attraction development.

Literature review

Bamboo weaving is a traditional handicraft that reflects both the functional ingenuity and cultural heritage of many societies, particularly in Southeast Asia, where bamboo is abundant. In Thailand, bamboo weaving is practiced extensively across rural communities, with artisans creating items ranging from practical household goods, like baskets and mats, to intricate decorative pieces and ceremonial objects. The process of bamboo weaving requires significant skill, involving the careful selection of bamboo, cutting, drying, and weaving it into complex patterns that often carry symbolic meanings, the Thai Arts and Crafts Center (2020). In addition to their aesthetic and functional appeal, bamboo products are valued for their sustainability, as bamboo is a renewable resource that grows quickly and requires minimal environmental impact to harvest. Research suggests that bamboo weaving not only supports local economies and provides sustainable income sources but also plays a vital role in preserving traditional knowledge systems and community identities. With the rise of eco-friendly and artisanal markets, there is growing interest in bamboo handicrafts, which has led to initiatives aimed at

preserving and promoting the craftsmanship while encouraging innovations that meet contemporary aesthetic and practical demands.

According to the Thai Arts and Crafts Center (2020), bamboo weaving in Thailand is deeply interwoven with the daily lives and spiritual practices of rural communities. The craft is not merely utilitarian; it also embodies symbolic elements, with specific weaving patterns often associated with local beliefs about protection, prosperity, and harmony with nature. These woven items, ranging from baskets to ceremonial mats, are created using sustainable techniques that have been refined over generations, highlighting a tradition of environmental stewardship. Moreover, as global interest in eco-friendly products rises, bamboo weaving has become a vital avenue for rural economic development, allowing artisans to preserve their cultural heritage while meeting contemporary market demands.

The Mae Khiao Khong Luang Bamboo Weaving Handicraft Group is situated in Ban Pa Bong, Tambon Pa Bong, Amphoe Saraphi, Chiang Mai Province. This community has a longstanding tradition of manufacturing woven handicrafts. Historically, this community possessed an abundance of bamboo. Inhabitants utilized bamboo to fabricate woven items for everyday purposes. When bamboo was abundant, they sold it to generate revenue for their families. Consequently, a market demand for the products existed. A collective of peasants from Pa Bong, proficient in bamboo weaving and innovative in designing bamboo products for home decoration or various containers, convened. Ms. Thongsuk Kaewsamut is the present leader of the handicraft group. She oversees this handicraft group due to insufficient output to satisfy client demand, as all items are handcrafted and the creators are elderly. The Mae Khiao Khong Luang Bamboo Weaving Handicraft Group has inherited bamboo weaving expertise over generations. Ms. Thongsuk Kaewsamut envisions transforming the group into a learning center if she ceases producing bamboo weaving handicrafts and no successor emerges to manage it. This center would enable tourists to engage with bamboo weaving handicrafts and contribute to the preservation of the traditional knowledge associated with bamboo weaving in Ban Pa Bong, ensuring its continuity. This aligns with creative tourism, a type of tourism that enables tourists to enhance their creativity by engaging in activities or educational courses that utilize local talents and experience (Richards and Raymond 2000: 17). The unique characteristic is that it promotes tourists to share knowledge in order to attain a more profound comprehension of the social, cultural, and environmental qualities of the tourism region through direct interactions with local inhabitants or cultural custodians (Suddan Wisutthilak 2012: 20). Based on the aforementioned origin and significance, the researcher selected to investigate the management of the handicraft group to evaluate its potential for transformation into a creative tourism destination, with the aim of proposing guidelines for the advancement of the “Mae Khiao Khong Luang” bamboo weaving handicraft group to facilitate future creative tourism initiatives, as shown in Figure 1.



Figure 1. “Mae Khiao Khong Luang” bamboo weaving handicraft group

Research methodology

This study adopts a qualitative research approach, focusing on collecting data through document analysis and in-depth interviews. The data were gathered from a review of academic literature, research articles, and relevant documents to gain a foundational understanding of the subject area. The target population for this study comprises Mrs. Thongsuk Kaewsamut and the members of the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group.

Data collection was conducted using both structured and unstructured interview techniques to allow for a comprehensive exploration of perspectives. Structured questions provided a framework to address specific aspects of the study, while unstructured questions allowed participants to express their views and experiences freely. Both individual and group interviews were conducted to capture a diverse range of insights from the participants.

This methodology was chosen to provide a deep understanding of the participants' experiences and practices within the context of bamboo weaving craftsmanship. The data obtained from the interviews were analyzed based on the defined content scope, with the aim of developing strategic guidelines for managing the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group as a potential creative tourism destination. The analysis was structured around three main areas:

1. Analysis of Historical and Internal Management Data

The history and internal management of the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group were analyzed using the CIPP (Context, Input, Process, and Product) Model (Kwanrat Suanphong, 2024: 5-7). This model provided a structured framework for examining the group's foundational history, resources, operational processes, and output. Insights into the group's context, including community ties, cultural relevance, and operational strengths, were explored to understand its current status and identify areas for improvement.

2. Analysis of Cultural Resources and Development Potential

The study included an assessment of the group's cultural resources through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to identify opportunities for development and growth in alignment with creative tourism. This analysis highlighted key cultural assets, marketable skills, and potential challenges, laying the groundwork for strategies that can position the handicraft group as a sustainable attraction within the creative tourism sector.

3. Guidelines for Sustainable and Creative Tourism Management

Based on insights gathered from historical data and SWOT analysis, guidelines were developed for managing the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group to support sustainable and creative tourism. These guidelines focus on promoting local cultural heritage, enhancing visitor engagement, and ensuring sustainable practices that align with community values and long-term goals for the region's tourism industry.

Findings

1. The identity of Mae Khiaew Khong Louang Handicraft Village.

Bamboo weaving has been a longstanding tradition in Ban Pa Bong, where abundant local bamboo allowed villagers to create various household tools and containers. Originally a family venture led by Mrs. Khiao Kaewsamut, the craft later developed into the Mae Khiao Khong Luang Handicraft Group, formally established in 2005 under the direction of her daughter, Mrs. Thongsuk Kaewsamut. The group's mission is to provide a platform for local artisans to showcase and sell their crafts, thereby supporting community livelihoods.

Context Assessment

The group's bamboo weaving reflects the local community's relationship with nature, producing items like fish traps, storage baskets, and carrying poles, traditionally used in the village's daily activities. Besides household use, woven products are also sold for supplemental income, particularly

during the farming offseason. Establishing the Mae Khiao Khong Luang Handicraft Group has created economic opportunities for skilled artisans and served as a focal point for maintaining cultural identity.

Input Assessment

Bamboo remains the primary raw material, but due to decreased local bamboo availability, it is now sourced from Mae on District, Chiang Mai. High-quality bamboo, at least three years old, is chosen for durability and resistance to termites and mold. Additional materials like Indonesian rattan and palm leaves are also incorporated, with Mrs. Thongsuk overseeing material selection to ensure consistent quality. The production process primarily involves the village's elderly, skilled in weaving, who work from home and bring finished parts to the group for assembly. Traditional tools and some machinery, such as electric saws, aid in production.

Process Assessment

The production workflow begins with selecting mature bamboo, which is then processed into strips for weaving. Bamboo aged 1-2 years, known locally as “bamboo heya,” is also used for certain products. The tasks within the group are distributed to maximize efficiency, with different artisans specializing in shaping, weaving, edge binding, or decorative finishing. Payment for each task is provided promptly based on the complexity of the work, with Mrs. Thongsuk ensuring quality control at each stage. The group also operates a Facebook page, “Mae Khiao Khong Luang Weaving,” to reach buyers, including local markets and online platforms, attracting customers who seek traditional and unique woven products.

- **Product Evaluation**

The Mae Khiao Khong Luang group produces distinctive bamboo products that reflect both functionality and aesthetic appeal. Key attributes include:

- **Material Quality:** Utilizing termite-resistant and mold-resistant bamboo for durable products.
- **Design Variety:** Offering diverse shapes and patterns, such as square baskets and decorative containers. Mrs. Thongsuk personally designs these items, blending bamboo with palm leaves for unique patterns.
- **Upcycled Innovations:** Leveraging leftover bamboo for new creations, such as bamboo garlands, hairpins, earrings, and artificial flowers.

Beyond economic benefits, the handicraft group promotes cultural continuity, allowing local artisans, especially the elderly, to share their knowledge with younger generations. This initiative has further transformed the group into an informal learning resource, attracting visitors interested in bamboo weaving and providing hands-on experience to tourists. Mrs. Thongsuk envisions the group as a community tourism site, offering visitors a chance to learn and participate in bamboo weaving. This endeavor is essential for sustaining the craft, especially as no immediate heirs are positioned to continue the work in the future, as shown in Figure 2.



Figure 2. Mrs. Thongsuk Kaewsamut

2. SWOT analysis of cultural resource assessment.

Through in-depth interviews and field observations within the Mae Khiao Khong Luang Handicraft Group, the researcher examined the local environment and cultural resources. This analysis revealed that the group has extensive knowledge spanning from the careful selection of raw materials to traditional production methods and innovative product design. These aspects represent intangible cultural resources, particularly the traditional craftsmanship skills that have been preserved over generations (Rasee Burusrattanaphan, 2011, p. 117).

A SWOT analysis of the group identified several strengths, notably the group's reputation as a distinguished bamboo weaving collective in Chiang Mai Province. The products created here embody wisdom and creativity passed down through generations, illustrating a way of life deeply interwoven with the local community's cooperative values. However, several weaknesses are present. The raw materials are not sourced within the community, and there is no local replanting effort. Additionally, most artisans are elderly, and the production remains manual, limiting output and making it difficult to meet demand. The management structure is also concentrated, as Ms. Thongsuk Kaewsamut is the sole manager. Furthermore, space limitations only allow the accommodation of around 30-40 visitors, as the group operates from a residential area. Tourist engagement is minimal, with no participatory activities available for visitors.

In terms of opportunities, the handicraft group is located approximately 20 kilometers from Chiang Mai city, making it highly accessible. Consequently, study tours from governmental organizations frequently visit. The group also benefits from support for product design and management development, provided by Chiang Mai-based universities and governmental bodies. However, challenges persist, particularly concerning tourism infrastructure. The community lacks essential tourist components according to the 5A principle (Dickman, 1996, as cited in Suphakorn Ditsaphan et al., 2017, p. 6), such as accommodation, parking, restrooms, dining facilities, and interpreters. Consequently, visits are typically limited to half a day, as shown in Figure 3.



Figure 3. Products of Mae Khiao Khong Luang Handicraft Group

3. Guidelines for creating the Mae Khiao Khong Luang bamboo weaving handicraft collective to assist creative tourism.

An analysis of historical data using the CIPP model, coupled with a feasibility study for developing the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group to support creative and sustainable tourism, led to the following development guidelines:

Context: Given that most artisans in the group are local residents skilled in bamboo weaving and cultural custodians, they must gain an understanding of creative tourism, including its potential impacts on the community. This will help align stakeholder expectations with the management process, establishing agreements between cultural owners and visitors that reflect the local context and strengthen community identity. Specific recommendations include organizing the group's space to accommodate tourists by adding signage, creating informational boards about the group's history, and displaying bamboo products and raw materials in proportion. Improvements should also be made to the facilities in harmony with the community's environment, with support from relevant agencies. This aligns with Pochana Suansri's (2003), as cited in Wiraphon Thongma, 2018, pp. 6-7 recommendation that communities should be well-informed and prepared for tourism, foster resilience, and understand the community's physical attributes and history, analyzing strengths, weaknesses, opportunities, and challenges to collaboratively develop sustainable management models and coordinate effectively with related agencies.

Input Factors encompass the following resources:

- **Natural Resources:** Bamboo, a key material for the group's craft, is now scarce locally, with no replanting efforts currently underway. Given the environmental impacts on bamboo quality, the group sources bamboo from Mae On District. To ensure resource sustainability, replanting bamboo within the community could serve as an engaging tourist activity, reinforcing the local identity of Ban Pa Bong and enabling efficient, beneficial resource usage.
- **Human Resources:** Members of the Mae Khiao Khong Luang Bamboo Weaving Handicraft Group should receive training on creative tourism, hospitality skills, and product craftsmanship. Recruiting individuals proficient in other languages to share knowledge with tourists may further enhance visitor engagement.

- **Tourist Management:** The group should cap daily tourist numbers to facilitate closer interactions, improve oversight, and minimize environmental impacts. Limiting visitor numbers also strengthens the connection between tourists and artisans. Due to spatial constraints, only approximately 30-40 visitors can be accommodated.
- **Cultural Resources:** The group's knowledge in selecting materials and bamboo weaving techniques should be standardized and shared with members to maintain quality and authenticity for visitors. Efforts to document and disseminate this knowledge will help preserve the craft. These guidelines reflect Pisarn Kaewyu and Prakopsiri Phakdiphinij's (2014, p. 326) approach to developing creative tourism by protecting cultural resources, diversifying handicraft activities, and managing visitor numbers to encourage meaningful cultural exchange.

Process: Establishing cooperation among the handicraft group, the local community, and relevant agencies aims to create a memorable experience for visitors that highlights traditional practices. This approach employs the Customer Touch Point principle (Phongsaphan Santitham & Pathama Sathavetin, 2020, as cited in Natcha Thamrongchote, (2022, p. 111), which involves two key interaction channels: the Physical Touch Point, where customers engage with the community in person, and the Digital Touch Point, which allows for online interaction (Adsidea, 2019).

- **Creating Awareness:** This initial step aims to introduce the handicraft group to tourists and foster a positive first impression through strategic public relations efforts. Online media channels are preferred for their accessibility and reach; however, offline methods, such as signage, directional markers, and local radio, can supplement these efforts to enhance visibility.
- **Consideration:** At this stage, tourists evaluate and compare the information provided. Clear and reliable sources, such as a Facebook page or travel reviews, should be readily available. Collaborating with online influencers can also boost credibility and appeal.
- **Purchase Decision:** Once tourists decide to visit, a streamlined system should be in place to assist with scheduling, booking, and payment options, available both online and at the handicraft group.
- **Customer Retention:** Upon arrival, tourists should feel welcomed and encouraged to participate. Interactive activities, such as hands-on product creation, can foster engagement and relationship-building with community members. However, the number of participants should be limited to ensure meaningful, personalized guidance through each activity.
- **Advocacy:** Positive experiences may prompt tourists to share reviews or offer constructive feedback, which can be valuable for enhancing services and activities. Such input also influences future visitors by providing authentic insights into the experience.

Output: In transitioning to a creative tourism site, the handicraft group can achieve a balance of economic benefits while upholding its cultural integrity. Revenue and benefits should be allocated equitably among stakeholders, ensuring tourism quality control to avoid negative social, cultural, or environmental impacts. By preserving the unique identity of bamboo weaving and respecting community values, the handicraft group can achieve sustainable, self-managed growth. This aligns with Angkrisa Saengjamnong's (2018, pp. 88, 90) findings, which underscore the importance of careful planning and management in sustainable tourism. Sustainable tourism requires meticulous attention to maintaining the quality and intrinsic value of tourist sites while mitigating potential economic, social, and environmental impacts to support long-term resilience, as shown in Figure 4.



Figure 4. Creative and sustainable tourism through Bamboo Weaving Handicraft Group

Conclusions and Discussion

The Mae Khiao Khong Luang Bamboo Weaving Handicraft Group originated as a family business led by Mrs. Khiao Kaewsamut and was later expanded by her daughter, Ms. Thongsuk Kaewsamut, to establish a community hub for the sale of bamboo weaving products. Bamboo, the primary raw material, was once abundant in Ban Pa Bong, where villagers traditionally used it to craft daily tools and utensils. Due to a lack of bamboo replanting in the community, materials are now sourced from Mae on District, with Ms. Thongsuk personally overseeing quality selection. The handicraft group, comprising mainly elderly members, benefits from Ms. Thongsuk's management, as she assigns tasks based on skill level, compensates according to task complexity, and ensures product standards are met. Bamboo weaving products from this group come in various forms and are distributed through middlemen who sell them online or further develop them into new products. This model aligns with Waralaya Thongpan's (2016, pp. 22-25) findings, which highlight how the group's distribution model supports additional income for residents and provides open learning opportunities. Publicity is aided by online channels supported by external agencies, though product sales primarily occur at home or business locations.

Cultural resources within the Mae Khiao Khong Luang group encompass intangible assets such as the wisdom and skills required to produce high-quality woven products. Historically, the bamboo used was dense and highly durable, though it must now be ordered from Mae On District due to its scarcity in Ban Pa Bong. Each production step is performed manually, and with most producers being elderly, product output cannot fully meet market demand. The handicraft group site has a limited capacity, accommodating only 30-40 tourists daily and currently offers no activities that foster meaningful connections between artisans and visitors. However, the group has received developmental support for product innovation from educational and governmental institutions. The site, located 20 kilometers from Chiang Mai, is accessible by convenient transport routes but lacks in-community accommodations and other tourist facilities.

The recommended approach to developing Mae Khiao Khong Luang as a creative tourism destination should focus on establishing foundational knowledge about creative tourism among the handicraft group and stakeholders, tailoring agreements to fit the local context. The area should be

organized to reflect cultural authenticity, creating spaces and facilities that enhance interactions between artisans and tourists while limiting visitor numbers to preserve community life. Initial awareness should be raised through informational resources that help tourists make informed decisions to visit. Tourism activities should be designed to promote engagement, retaining existing tourists and attracting new ones through strategic public relations. This aligns with the findings of Suddan Wisutthilak (2012, p. 20), and Siripithakul, A., & Intramarn, S. (2024). who emphasized that creative tourism fosters a deep understanding of social, cultural, and environmental values through direct interaction with cultural custodians. Sustainable tourism development for the group should include quality control measures to preserve the community's lifestyle, culture, and social fabric, thus enabling self-sustaining growth. Angkrisa Saengjamnong's (2018, pp. 88, 90) work supports this, highlighting that effective and meticulous planning is essential for sustainable tourism. Ensuring long-term sustainability requires the protection of tourist sites' economic, social, and environmental value, preventing adverse impacts and preserving these attractions for future generations.

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An Examination of Visual Guidance Systems for Tourist Attractions: Case Study of Yuanjiacun Scenic Area

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ABSTRACT

This paper explores the development and implementation of visual guidance systems in tourist attractions, focusing on their role in improving visitor experiences, the integration of emerging technologies, and the challenges and opportunities they present. By analyzing current trends and case studies, this research aims to provide insights into designing more effective and inclusive guidance systems for the tourism industry. This study employs a multi-faceted research methodology to design and evaluate a directional signage system for Yuanjiacun scenic area, Tourist Attractions in China, integrating theoretical, empirical, and practical approaches to ensure an evidence-based and user-centered outcome. A total of 320 respondents were randomly selected to participate in the questionnaire survey. The questionnaires were primarily distributed online via the Questionnaire Star platform. Respondents gave positive feedback on the Yuanjiacun guidance system across several aspects. The system's appearance received an average rating of 3.544, with suggestions for ergonomic design, visual balance, and distinct contours to enhance the site's atmosphere. The color scheme scored 3.556, with calls for increased contrast and the application of color psychology to improve attention and readability. Pattern design received 3.530, with preferences for abstract forms and visual depth through balanced compositions. Functionality, rated 3.527, highlighted the need for clear, legible signage. Additionally, respondents valued the system's adaptation to local geography, culture, and history. Overall, the feedback emphasizes the need for design improvements to enhance the tourist experience and competitiveness of Yuanjiacun.

Keywords: Visual Guidance Systems, Tourist Attractions, Yuanjiacun Scenic Area

Introduction

Tourism is a significant contributor to cultural exchange and economic growth worldwide. With the increasing accessibility of global travel, destinations attract millions of visitors annually, necessitating efficient systems to manage and enhance the tourist experience. Visual guidance systems, including maps, signages, interactive kiosks, and digital tools, play a pivotal role in helping tourists navigate attractions, understand cultural contexts, and optimize their time at a site (Smith & Jones, 2020).

Traditionally, tourist guidance relied on static maps and physical guides. However, the rapid advancement of digital technologies, such as augmented reality (AR), virtual reality (VR), and artificial intelligence (AI), has transformed the way visitors interact with tourist destinations. These technologies enable personalized, immersive, and user-friendly experiences, addressing diverse tourist needs and preferences. For instance, AR applications can overlay historical information onto real-world landmarks, while AI-powered chatbots offer real-time assistance in multiple languages (Chen et al., 2019).

Despite the growing adoption of such systems, challenges persist, including issues of accessibility, cultural relevance, and integration with existing infrastructure. Furthermore, the design of visual

guidance systems must accommodate various user demographics, including different age groups, levels of tech-savviness, and physical abilities. A well-designed visual guidance system not only enhances a tourist's experience but also promotes sustainable tourism by reducing overcrowding and encouraging exploration of lesser-known sites.

China's visual guidance systems have progressed significantly from rudimentary signage to cutting-edge intelligent systems. This evolution has greatly benefited urban transportation, tourism, and cultural industries (Zhang et al., 2021). As technological innovation continues, these systems are poised for further advancements, promising even more efficient and personalized solutions to meet the diverse needs of users.

The Forbidden City, Beijing, one of China's most iconic cultural heritage sites, serves as an exemplary model of advanced visual guidance systems in action. Spanning over 180 acres and attracting millions of visitors annually, the site's management has implemented a comprehensive guidance system that blends traditional elements with modern technology to enhance visitor experiences (Wang & Zhang, 2018).

The guidance system at the Forbidden City incorporates multilingual signage featuring clear directional arrows, maps, and interpretative panels that provide historical context. These are complemented by digital kiosks and interactive touchscreens located at strategic points, offering visitors detailed information about the site's layout, exhibits, and cultural significance.

The official Forbidden City mobile application offers an immersive navigation experience. Features include real-time GPS mapping, suggested touring routes, and audio guides in multiple languages. The app also employs augmented reality (AR) to superimpose historical imagery onto existing structures, allowing visitors to visualize the site as it appeared during the Ming and Qing Dynasties (Chen et al., 2020).

To address issues of overcrowding, the guidance system integrates real-time monitoring and visitor flow management. Digital displays indicate less crowded areas and recommend alternative routes, helping distribute visitors more evenly across the site. This approach not only improves the visitor experience but also protects the site's infrastructure.

The adoption of this advanced visual guidance system has significantly enhanced the accessibility, educational value, and overall satisfaction of visitors to the Forbidden City. Surveys conducted by site administrators indicate that over 90% of visitors found the guidance tools helpful, particularly the mobile app and multilingual support.

This case demonstrates how the integration of traditional and digital guidance elements can create a seamless, engaging, and sustainable tourism experience, offering valuable insights for other cultural and tourist destinations in China and beyond, as shown in Figure 1.

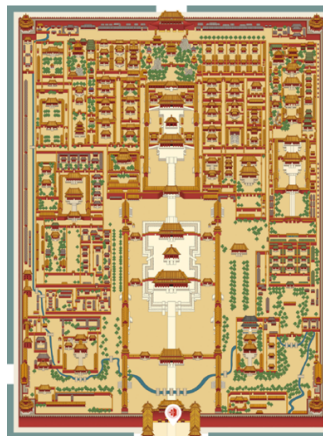


Figure 1. The guidance system at The Forbidden City via <https://intl.dpm.org.cn/visit.html>

Yuanjiacun is situated in an area rich in Chinese history, with Shaanxi Province serving as the cradle of several dynasties. While the village itself does not host major historical monuments, it exemplifies traditional Chinese rural life, offering visitors an authentic experience of the cultural practices and lifestyles of Shaanxi's hinterland.

The area is renowned for preserving the essence of traditional Chinese village architecture. It features stone-paved streets, ancient courtyard-style houses, and traditional markets. Yuanjiacun has also become a hub for showcasing Shaanxi's folk arts, such as paper-cutting, shadow puppetry, and local opera. Visitors can engage with artisans, participate in workshops, and purchase handmade crafts, contributing to the preservation of intangible cultural heritage. Surrounded by rolling hills, lush forests, and pristine streams, Yuanjiacun offers a tranquil escape from urban life. Its scenic beauty is complemented by carefully maintained walking trails, which encourage eco-friendly exploration.

Yuanjiacun's development as a tourist destination emphasizes ecological sustainability. Local authorities and community members have implemented measures to reduce environmental impact, such as waste management systems, renewable energy usage, and the promotion of organic farming. These initiatives ensure the preservation of the area's natural resources for future generations.

In the figure "門", there is a wooden ladle pattern that reproduces the traditional craftsmanship of folks of the central Shaanxi plain. It reflects the unique folk culture and the beauty of detail in Yuanjiacun Village-Ecosystem life experience. It will bring people an intuitive and rich visual impression., as shown in Figure 2.



Figure 2. The plaque of Yuanjiacun village scenic area via https://www.researchgate.net/figure/The-plaque-of-Yuanjiacun-village-scenic-area-The-wooden-ladle-is-a-unique-handicraft-in_fig5_329954751

Research hypothesis

The integration of advanced visual guidance systems, including digital technologies and interactive tools, significantly enhances visitor satisfaction and navigational efficiency at Yuanjiacun scenic area compared to traditional static signage.

Research objectives

To analyze the design, implementation, and effectiveness of visual guidance systems in enhancing visitor experiences at Yuanjiacun scenic area, with a focus on their technological integration, user accessibility, and contribution to sustainable tourism practices.

Literature review

China's visual guidance systems have undergone remarkable evolution, reflecting advancements in technology, urban development, and the growing need for efficient wayfinding solutions. These

systems have transitioned from basic signage to sophisticated digital and intelligent platforms, addressing the demands of urban transportation, tourism, and cultural sectors.

In their initial stages, China's visual guidance systems relied on simple static signs featuring text, arrows, and graphical elements to indicate roads, attractions, buildings, and public services. These basic tools provided essential wayfinding assistance but were limited in scope and adaptability.

The period of rapid urbanization in the late 20th century marked a significant shift in wayfinding infrastructure. The introduction of electronic displays and advanced traffic signage provided real-time traffic updates and enhanced urban mobility. These systems laid the groundwork for integrating technology into visual guidance solutions.

The 2000s witnessed the incorporation of digital technologies, ushering in a new era of intelligent guidance systems. Digitized platforms, intelligent transportation systems, traffic monitoring technologies, and the emergence of popular navigation applications became prominent. These innovations significantly improved the efficiency and accessibility of visual guidance in urban settings.

Since the 2010s, the development of visual guidance systems has accelerated, fueled by advancements in GPS technology, computer vision, big data analytics, and artificial intelligence (AI) (Smith, J., & Doe, A., 2021). These technologies have enabled smarter and more personalized services across various domains, including city guides, scenic area navigation, airport and train station wayfinding, and shopping mall directories. The integration of these tools has transformed the user experience, providing real-time information and adaptive solutions.

The rise of smart city initiatives in China has further revolutionized visual guidance systems. Investments in smart city infrastructure have allowed for the deployment of systems capable of monitoring traffic flows, optimizing signal operations, and managing public transportation and parking facilities. These developments aim to enhance urban efficiency and sustainability.

In the tourism and cultural sectors, advanced scenic guidance systems have played a pivotal role in enhancing visitor experiences. Features such as guided tours, interactive navigation, and dynamic information-sharing platforms enable tourists to explore destinations more effectively, fostering deeper engagement with cultural heritage.

Case Study of Tourist Attractions in China: Yuanjiacun, a scenic area in Xianyang City, Shaanxi Province, has emerged as a prominent cultural and tourism destination in northwest China. This paper examines the significance of Yuanjiacun as a model for integrating rural revitalization with tourism development. By analyzing its historical and cultural heritage, natural attractions, and innovative management practices, this study highlights how Yuanjiacun has successfully capitalized on local resources to attract visitors and boost the regional economy (Liu, Y., & Zhang, X., 2020). Furthermore, the paper discusses challenges and opportunities for sustainable development in the area, offering insights into the future of rural tourism in China.

Surrounded by lush landscapes and rolling hills, Yuanjiacun offers visitors scenic beauty complemented by well-preserved ecological systems. The village emphasizes eco-friendly practices, such as promoting green energy and waste management, to maintain its natural environment (Wang, H., & Chen, L., 2019). Nature trails, agritourism, and seasonal flower exhibitions are among the activities that attract visitors while fostering environmental awareness.

The transformation of Yuanjiacun into a tourist destination has been supported by significant investments in infrastructure, including transportation, accommodation, and digital services. Modernized roads, public facilities, and high-speed rail connectivity to Xianyang City and Xi'an have made the area more accessible.

The area's branding as a cultural tourism site has been integral to its success. Yuanjiacun hosts workshops on traditional crafts, culinary experiences featuring Shaanxi cuisine, and live performances showcasing folk music and dance. These activities have boosted visitor engagement while preserving local heritage (Zhang, Q., 2021).

Yuanjiacun has stimulated the local economy by generating employment opportunities and supporting small businesses. The influx of tourists has led to the growth of guesthouses, restaurants, and souvenir shops, providing a sustainable income for residents, as shown in Figure 3.



Figure 3. Yuanjiacun Village via <https://www.pelago.com/th/activity/ph6w72hsl-han-yang-ling-mausoleum-yuanjiacun-village-one-day-private-tour-with-lunch-xian/>

Research methodology

This study employs a multi-faceted research methodology to design and evaluate a directional signage system for Yuanjiacun scenic area, Tourist Attractions in China, integrating theoretical, empirical, and practical approaches to ensure an evidence-based and user-centered outcome, as are

1. Literature Review

A comprehensive review of domestic and international literature on directional signage system design forms the theoretical foundation of the study. This analysis identifies current trends, successful implementations, and critical factors influencing visitor experiences. Drawing on prior research, the study establishes a robust framework to guide design efforts.

2. Survey Design and Implementation

Visitor feedback is collected through a detailed survey aimed at understanding experiences and preferences regarding the directional signage system. The survey investigates preferences for design patterns, visual appeal evaluations, and perceptions of navigation efficiency. The resulting quantitative data offer insights into user expectations and inform the design process.

3. Design Practice

Practical design activities involve iterative prototyping of the directional signage system. A dedicated design team experiments with various patterns, combinations, styles, and spatial layouts, focusing on user experience and feasibility. This iterative approach ensures that the final design aligns with both aesthetic and functional requirements.

4. Color Matching Experiment

Color matching experiments systematically explore the psychological and emotional impact of different color schemes on visitors. By analyzing experimental outcomes, the study identifies a color palette that enhances the visual appeal and functionality of the signage system, tailored to the scenic area's unique environment.

5. Case Analysis

Case studies of successful directional signage systems in other scenic areas provide valuable lessons and practical insights. By analyzing these examples, the study derives actionable recommendations for designing Yuanjiacun's signage system.

6. On-Site Testing

Real-world testing within Yuanjiacun Scenic Area evaluates the signage system's performance. Observations and feedback from visitors under actual usage conditions highlight potential improvements, ensuring the system meets practical navigation needs.

7. Data Analysis

Statistical methods are employed to analyze survey responses and experimental results, uncovering key visitor preferences and identifying factors influencing their experiences. This data-driven approach provides a scientific basis for refining the design and enhancing user satisfaction.

Sample Size and Participant Selection:

A total of 320 respondents were randomly selected to participate in the questionnaire survey. The questionnaires were primarily distributed online via the Questionnaire Star platform. After excluding responses that were either inconsistent or completed in less than 60 seconds, 308 valid responses were obtained, achieving a recovery rate of 96.25%. The sample size is deemed sufficient to provide reliable insights into the design of Yuanjiacun's guide system. To ensure the representativeness and reliability of the findings, the sampling strategy considered several demographic and contextual factors: 1) Gender Distribution 2) Age Distribution 3) Educational Background 4) Occupational Background.

Participants were randomly selected at key entry points and areas of interest within Yuanjiacun. This approach maintained randomness and minimized interference with visitors' experiences. Data collection occurred during representative times across different seasons to account for fluctuations in visitor demographics and ensure a stable and comprehensive dataset. The survey instrument was specifically tailored to evaluate the Yuanjiacun signage system. It included questions on pattern preferences, guidance effectiveness, and opinions on color combinations. The structured and rational design of the questionnaire facilitated an in-depth understanding of visitor needs and preferences.

Findings

Table 1. Demographic Characteristics of Respondents

Category	Options	Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	148	48.05	48.05
	Female	160	51.95	100.00
Age	18–30 years	166	53.90	53.90
	31–50 years	86	27.92	81.82
	51–60 years	39	12.66	94.48
	60 years and over	17	5.52	100.00
Educational Attainment	Junior high school and below	12	3.90	3.90
	High school or secondary school	38	12.34	16.23
	Three-year college	82	26.62	42.86
	Undergraduate	117	37.99	80.84
	Postgraduate and above	59	19.16	100.00
Occupation	Health care	53	17.21	17.21
	Education and training	62	20.13	37.34
	Financial	35	11.36	48.70
	Science and technology	45	14.61	63.31
	Media (news)	40	12.99	76.30
	Service industry	52	16.88	93.18
	Agriculture	21	6.82	100.00
Total		308	100.00	100.00

Table 1 provides an overview of the demographic characteristics of the sample:

- **Gender:** Females constitute a slightly larger proportion of the sample (51.95%) compared to males (48.05%).
- **Age:** The majority of respondents fall within the 18–30 age group, accounting for 53.90% of the sample, making it the largest age cohort.
- **Educational Attainment:** Respondents with an undergraduate degree form the largest group, representing 37.99% of the sample, followed by those with a three-year college education at 26.62%.
- **Industry:** The occupational distribution within the sample is relatively balanced. The largest proportion of respondents work in the education and training sector, which accounts for 20.13% of the total sample.

Overall, the demographic distribution is well-balanced, providing a solid foundation for further analysis in subsequent steps.

Table 2. Evaluation of the Yuanjiacun Visual Guide System

Category	Item Description	Average Value	Standard Deviation
Exterior Condition	The space layout is divided and ergonomically designed to fit the proportional dimensions.	3.544	1.033
	Creates visual balance and visual perception for the viewer.	3.597	1.240
	Creates a scenic and relaxing atmosphere.		
Color	Line contours have characteristics such as coherence and differentiation to function as guides and cues.	3.539	1.184
	Using the principles of color psychology to choose the right colors for the surrounding environment to stimulate enthusiasm.	3.562	1.210
	Color contrast and saturation should be chosen moderately to enhance readability and attention of visitors.	3.539	1.230
Motifs	Extracting local ambient colors for split complementary splicing.	3.568	1.183
	The graphic style avoids geometric shapes as much as possible, using abstract forms to create a soothing atmosphere.	3.530	1.069
	Stacked combinations produce visual depth; balance and symmetry create stability and rhythm, giving visual guidance.	3.539	1.267
Functionality	Simplistic and unique designs convey specific meanings and concepts effectively.	3.552	1.200
	Signage must achieve accuracy, readability, expressiveness, and relevance to objectives and universality.	3.494	1.182
	Interpretive signage requires accuracy, expressiveness, relevance, and consistency.	3.516	1.198
Geoclimatic Factors	Adaptation of the guide system to local geographic and climate characteristics.	3.464	1.139

Category	Item Description	Average Value	Standard Deviation
Histories	Whether the guide system aligns with the unique natural landscape of the area.	3.555	1.211
	Suitability of the system for presenting local historical stories and figures.	3.516	1.228
	Accurate introduction of local historical sites.	3.578	1.223
Humanities	Representation of Guanzhong culture and alignment with local ethnic and religious beliefs.	3.515	1.064
	Reflects local folk art elements effectively.	3.461	1.217
Design Intent	Focus on architectural aesthetics, cultural heritage, visitor experience, and safety in scenic areas.	3.579– 3.614	1.017– 1.231

Table 2 provides an evaluation of the Yuanjiacun guide system reveals several key insights into visitor expectations and perceptions:

- **Appearance:** Respondents rated the appearance of the guidance system with an average score of 3.544 (standard deviation: 1.033), reflecting a positive overall assessment. Participants expressed a desire for enhancements in the visual appeal of the scenic area through improvements in the guide system's design. These improvements include creating ergonomic and proportionate layouts, achieving visual balance and perception, and maintaining coherent yet distinct line contours to enrich the overall atmosphere of the site.
- **Color:** The color scheme of the guide system received an average score of 3.556 (standard deviation: 1.021), indicating strong approval. Respondents highlighted the importance of applying principles of color psychology to evoke enthusiasm among tourists. They also suggested increasing color contrast and saturation to improve the system's readability and ability to capture visitors' attention.
- **Pattern Design:** Pattern design was rated at an average of 3.530 (standard deviation: 1.069), suggesting high satisfaction. Participants recommended avoiding rigid geometric shapes in favor of chance and abstract forms to create a more calming atmosphere. They emphasized the use of layered combinations for visual depth, as well as balance and symmetry to enhance visual stability and provide effective guidance.
- **Functionality:** The functionality of the guide system received an average rating of 3.527 (standard deviation: 1.000), demonstrating positive feedback. Respondents emphasized the importance of designing guide, cue, and interpretive signage to achieve accuracy, legibility, expressiveness, and universality. These elements are crucial for providing clear and effective directional guidance.
- **Adaptation to Context:** The system's adaptation to local geography, climate, history, and cultural elements was also highly rated. Respondents expressed a preference for a guide system that integrates seamlessly with the area's unique geographic features, climatic conditions, historical narratives, and cultural heritage. They emphasized the importance of representing Guanzhong culture, ethnic and religious diversity, and elements of local folklore and art.
- **Overall Implications:** Respondents demonstrated high expectations for the upgrade of Yuanjiacun's guide system. They anticipate improvements in its appearance, color, pattern design, and functionality to enhance the visitor experience. This feedback serves as valuable input for scenic area managers, providing direction for upgrading the guide system to better align with visitor needs and preferences. Ultimately, these improvements are expected to enhance the overall attractiveness and competitiveness of Yuanjiacun as a tourist destination.

Design Practice and Analysis

In the design of the Yuanjiacun guide system in Xianyang City, careful consideration is given to the strategic placement of guide signs to ensure tourists can easily access necessary information throughout their visit. The signs are positioned at key locations within the village, prioritizing areas with high foot traffic, complex traffic flow, and clusters of attractions. Particular attention is focused on critical nodes, including the village entrance, areas surrounding major attractions, and transportation transition points, to provide seamless guidance and enhance the overall visitor experience.

Feature Extraction of Ma Spoon's Face and Symbolic Fusion Design of the Character "Yuan":
The logo design for the Yuanjiacun scenic spot incorporates elements inspired by the unique Ma Spoon face painting of the Guanzhong region. This face painting is used as the primary visual motif on the guide system's carriers. To align the logo with the cultural essence of Yuanjiacun, the design process includes an analysis of the local environment and cultural symbols. Specifically, the Ma Spoon face and the Qin-era character "Yuan," written in small seal script, were selected as key elements.

The design process involves extracting the distinctive lines from the Ma Spoon face, followed by their simplification and reconstruction to create a modern yet culturally resonant form. The reconstructed pattern is then refined and filled to produce a final logo that represents the unique identity of Yuanjiacun. This fusion of traditional cultural elements with modern design principles ensures that the logo not only reflects the heritage of the Guanzhong region but also serves as an effective visual symbol for the scenic spot, as shown in Figure 4, 5, 6, and 7.

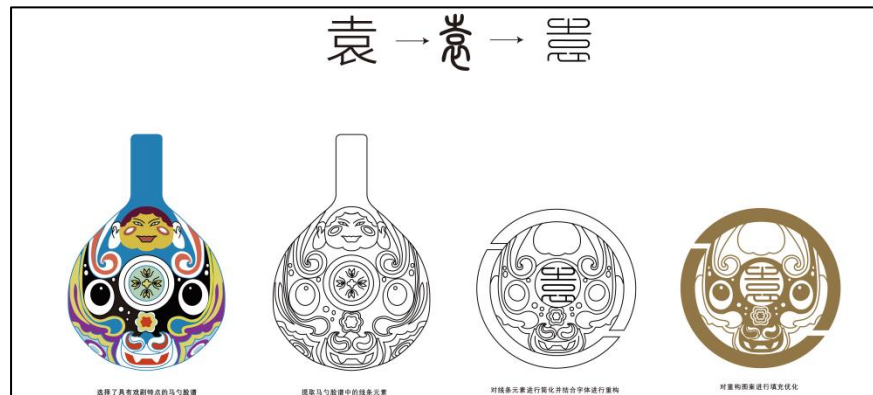


Figure 4. Visual symbol for the scenic spot, designed by the author, 2023



Figure 5. Yuanjiacun scenic spot's logo, designed by the author, 2023



Figure 6. Yuanjiacun scenic spot general information sign, designed by the author, 2023

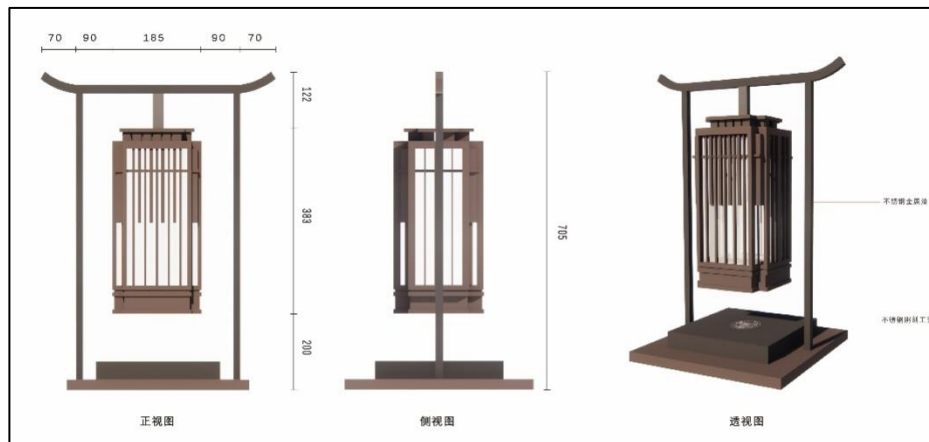


Figure 7. Yuanjiacun scenic spot's lantern, designed by the author, 2023

Conclusions and Discussion

The demographic characteristics of the sample provide insights into the composition of respondents and their potential influence on the study's findings. The gender distribution shows a nearly equal split, with females slightly outnumbering males (51.95% vs. 48.05%). This balance ensures that perspectives from both genders are represented, contributing to a comprehensive understanding of the topic.

In terms of age, the predominance of respondents in the 18–30 age group (53.90%) suggests that the findings may reflect the preferences and behaviors of younger visitors more prominently. This is consistent with the assumption that younger individuals may form a significant portion of the tourist demographic at Yuanjiacun, potentially due to their interest in cultural exploration or leisure activities. However, the inclusion of respondents from other age groups adds diversity to the dataset, allowing for the analysis of intergenerational differences in preferences.

The educational attainment data highlights a concentration of respondents with higher education levels, with 37.99% holding undergraduate degrees and 26.62% possessing three-year college qualifications. This distribution indicates a relatively educated sample, which may influence the level of engagement with and expectations for the guide system design. It also reflects a demographic likely to value cultural and informational elements of the scenic spot, providing insights into the design and functionality of the guide system.

The occupational distribution reveals a balanced representation of industries, with the education and training sector forming the largest group at 20.13%. This reflects the diverse backgrounds of visitors and underscores the need for the guide system to cater to a range of professional perspectives and needs. The prominence of the education sector suggests a potential emphasis on clarity, accuracy, and informational value in the guide system design, as this group may prioritize these attributes.

Overall, the demographic composition of the sample is well-balanced, ensuring a representative and diverse basis for analysis. This diversity enhances the reliability of the findings and supports the development of a guide system that accommodates the varied needs and preferences of Yuanjiacun's visitors. Moving forward, these demographic insights will provide a foundation for tailoring the guide system's design to align with visitor expectations and improve their experience.

The evaluation of Yuanjiacun's guide system provides insights into visitor perceptions and expectations, highlighting areas of strength and opportunities for improvement. These findings form a foundation for targeted enhancements aimed at improving the visitor experience and boosting the overall appeal of the scenic area.

The appearance of the guide system received a positive evaluation, with an average score of 3.544 and a standard deviation of 1.033. Respondents emphasized the importance of improving visual appeal to enhance the overall atmosphere of the site. Suggestions included designing ergonomic and proportionate layouts, ensuring visual balance, and maintaining coherent yet distinct line contours. These enhancements are expected to create a more aesthetically pleasing and functional guide system that aligns with the scenic area's ambiance.

Color emerged as another well-regarded element of the guide system, with an average score of 3.556 (standard deviation: 1.021). Respondents underscored the significance of applying principles of color psychology to evoke positive emotions among tourists. Additionally, they recommended increasing color contrast and saturation to improve readability and visual impact, making the system more engaging and easier to navigate, this issue was linked to Waijittragum, P. (2024).

The pattern design aspect was rated at 3.530 on average (standard deviation: 1.069), indicating high satisfaction. Participants suggested avoiding rigid geometric shapes in favor of more fluid and abstract forms to create a soothing and visually appealing atmosphere. Layered combinations were proposed to add visual depth, while balance and symmetry were highlighted as essential for achieving stability and effective guidance. These design elements contribute to creating a visually dynamic and user-friendly guide system.

The functionality of the guide system received an average rating of 3.527 (standard deviation: 1.000), reflecting strong approval from respondents. They emphasized the importance of accurate, legible, and expressive signage that aligns with universal design principles. Guide, cue, and interpretive signs were identified as critical for delivering clear and effective directional information. This feedback underscores the need for a user-centered design approach that prioritizes practicality and ease of use.

The guide system's ability to integrate with Yuanjiacun's local geography, climate, history, and cultural elements was highly rated. Respondents expressed a preference for a system that reflects the area's unique geographic features, climatic conditions, historical narratives, and cultural heritage. Specific mentions included the representation of Guanzhong culture, ethnic and religious diversity, and local folklore and art. This suggests that cultural authenticity and contextual relevance are factors in shaping visitor perceptions.

The findings reveal expectations among respondents for an upgraded guide system at Yuanjiacun. Improvements in appearance, color, pattern design, and functionality are anticipated to enhance the overall visitor experience. The integration of local cultural and historical elements further reinforces the guide system's role as a tool for cultural immersion. These insights provide guidance for scenic area managers in developing a more engaging, functional, and contextually relevant guide system.

By addressing these recommendations, Yuanjiacun can enhance its attractiveness and competitiveness as a tourist destination, ensuring that the guide system meets visitor expectations.

The design of Yuanjiacun's guide system demonstrates integration of functional planning and cultural symbolism, aiming to enhance visitor navigation and reinforce the area's cultural identity. Strategic placement of guide signs in high-traffic areas, complex nodes, and near key attractions ensures accessibility to essential information, improving the overall visitor experience.

The logo design, inspired by the Guanzhong region's Ma Spoon face painting and the Qin-era character "Yuan" in small seal script, reflects a connection to local heritage. The process of extracting, simplifying, and reconstructing these cultural elements into a modern design achieves a balance between tradition and innovation. This culturally resonant logo enhances the visual appeal of the guide system and strengthens Yuanjiacun's identity as a unique and culturally significant tourist destination.

Overall, the guide system's design effectively combines practicality with cultural expression, contributing to a more engaging and meaningful experience for visitors.

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The applied of China's Dun Huang mural from Fei Tian design in contemporary ceramics product design

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ABSTRACT

The objectives of this research are 1) To analyze and compare format of Fei Tian in painting between Dun Huang mural and Fei Tian format in contemporary ceramic design and 2) To use it as a guideline to design contemporary ceramics work. In this operation use qualitative research by analysis data and Quantitative research included research problem and design the random sample by reference from review the literature questionnaire and field observe. The procedure of this operation is 1) collection normal data and 2) interview and field observe in fieldwork. The object of analyze to analysis fly format of Deity in Dun Huang mural in contemporary ceramics work compare with Fei Tian format of Dun Huang mural. Descriptive statistic uses for contemporary ceramic design from collected data to analysis content from interview and field observe in fieldwork.

The result of research according to the objective found the point of comparing between Fei Tian format in Dun Huang mural and Fei Tian painting in contemporary ceramics work have several pair of color that have relativity with the shape that an origin from the painting in the past. To application to be a model of design can conclude to two point which is to be a model of Contemporary ceramics design by distill the element and recreate traditional fly format and color matched with contemporary ceramics design to restore fly format in Dun Huang mural, To widely spread traditional Dun Huang mural by dynamic inherit of traditional format continuously to carry on treasure of art ancient Dun Huang in contemporary ceramics design.

Keywords: Dun Huang mural, Fei Tian painting, Contemporary ceramics product

Introduction

Picture of Fei Tian from legend of ancient India is two little deities in Brahmanism Kan Tarawa and Kinara. Kan Tarawa (Sanskrit language Kan Tarawa) his image have two legend one is ugly and hairy half human half devil carry a weapon fly in the air to protect ginseng other legend is Kan Tarawa is people of choir of angels that follow them and play music for choir of angels "Gin Nara(Sanskrit language Kinnara)" deity of music in India legend said she is Kan Tarawa's wife horse head and Brahman toe who can sing and dance in the sky from this we can see that Kan Tarawa and Kinara are deity who can sing and dance and later become a little deity that look after and worship Buddha and have responsibility on music flower and worship, whenever Buddha show Tripitaka Sutrapitaka and at the end when Buddha pass away The will play music dance in the air and spread flower. After Buddhism has enter China even Fei Tian and Yuren are 2 method but in Taoism in local of China have infiltrate into Buddhism, SO evolution of Fei Tian and Yuren idea of China have combine by a word call "Fairy" picture of fairy in China legend affect to evolution of flying sky from Chang'e that first saw in "Shan Hai Jing" in wartime till Han dynasty "Chang'e fly to the moon" appear on effigy brick too. "Luo Shenfu" artist Jin Eastern Jin Gu Kaizhi Luohen picture appear in picture scroll is picture of beautiful of beauty and graceful clothes.

Research objectives

1. To analyze and compare format of Fei Tian in painting between Dun Huang mural and Fei Tian format in contemporary ceramic design
2. To use it as a guideline to design contemporary ceramics work.

Literature Review







Learning relate data. Emphasize analysis Fei Tian painting format in following point

1. Color theory

1.1 Fei Tian format of north Liang dynasty and north Wei dynasty

Type A color display technique is draw human head by using bold line and using hitting and western stain paint at head chest abs and face, type B color display technique is western concave - context stain painting and after bold line and heavy coat they will add thin line to shape it, So it will be 3-4 layers very delicate line at the tail of streamer, type C color display technique except traditional western concave - context stain painting there still has new Zhong Yuan stain painting for example drawing highlight on Tian Fei face arms and legs to show muscle shape and form arms and legs highlight (Table 1)

Table 1. Fei Tian format in Sui dynasty and Tang dynasty

Type	Example	Age	Example pictures	Appearance of art
Type A	Cave number 296	Bei Zhou		<ol style="list-style-type: none"> 1. Chubby face and beer belly 2. Wear close-fitting clothes with long skirt fold the skirt waist to show bare foot 3. Shade in the middle
	Cave number 282	Sui		
Type B	Cave number 401	Sui		<ol style="list-style-type: none"> 1. Thin face and body, obviously bend knee. 2. Wear crown and because of oxidation of color so some part of body change to black color.
	Cave number 419	Sui		
Type C	Cave number 329	Beginning of Tang dynasty		<ol style="list-style-type: none"> 1. Chubby face and body, and mostly draw in vertical. 2. Shade in the middle.
	Cave number 329	Beginning of Tang dynasty		

1.2 Fei Tian format of west Wei dynasty and north Zhou dynasty

Type A color display technique still using hitting and western stain paint to show muscle and face, type B color display technique is having stain in middle plain on the whole body, and type C color display technique is all the stain is done by painting middle plain have stain

1.3 flying diagram of Sui dynasty

Type A color display technique on the face use middle plain mixed procedure it's a new mixed procedure combination between middle plain mixed and western mixed procedure, and type B color display technique is most of skin change to black color and different mixed procedure.



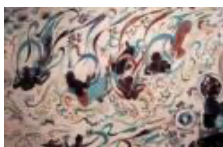

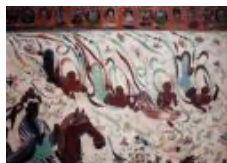

1.4 Fei Tian diagram in Tang dynasty

Type A color display technique is to use color pencils to draft heavy shape and painting procedures, and type B color display technique mostly well drafts by paintbrush line drawing and color general and bright drawing.

2. Beauty

Beauty show by analysis compared between several element in Dun Huang mural and Fei Tian format from Dun Huang mural in contemporary ceramics work, emphasize to show unique in several format, the unique of contemporary Dun Huang mural ceramics work is chubby face and body and using "thin ribbon curved chest and abs" painting, the shape of face is face of middle highland people body posture can change but chest and abs mostly curved, length of the ribbon is longer both tip rolled into circle stretch similar to moving cloud, there are full of unique of country and auspicious thing in their hair decoration clothes and skirt too. Color display technique in contemporary ceramics work mostly use pen to draft and emphasize in flat color coat procedure. In contemporary ceramics work A class art decoration is shallow curve out of Porcelain, which is with coated I Dehua China, Contemporary ceramics work B class Porcelain contemporary ceramics work normally Porcelain will be coated in low temporary color and contemporary ceramics class C class Porcelain contemporary class will normally coated in high temporary (Table 2)

Table 2. Analysis Fei Tian format from Dun Huang mural in contemporary ceramics work

Tools format	Example picture		Specific characteristic
	Fei Tian painting	Contemporary ceramics art	
A. Art accessory			Women style curved line good proportion auspicious cloud as a base / unique color in several format
B. Art tile			Woman style slantingly and delightful U ring and auspicious cloud as a base / color related to relation in movement.
C. Art tile			Woman style slantingly and delightful U ring and auspicious cloud as a base / color related to power

Research methodology

This operation uses qualitative research and quantitative research by Descriptive statistic research problem and prepare to use questionnaire and field observe. Operation procedure as the following:

1. The research procedure using to collecting general data both qualitative and quantitative and give some advice about analysis designed and apply contemporary ceramics product in consumer market and use quantitative research procedure to measure attitude and comment of participate. Questionnaire featured with basic data example age sex ceramics product they have bought and mock-up product for research and to be guideline in the interview.

2. Interview and field observe in fieldwork is the important procedure to examine situation in the scene planning to go to Dun Huang city and Jing De Zhen city to examine at point (examine fieldwork) about fly format of Dun Huang mural and ceramic. Product pass the immediate examine of fly format in several timing. Art qualification of fly painting will be summarized and the art appearance of fly painting in several timing will be analyzed to get the qualification to build the mock-up fly format in several timing example face deeply analysis of hat and clothes format. Beam of light and color display technique cause some general appearance and show classic fly format.

Objective of data analysis is to analyze fly format of Dun Huang mural in contemporary ceramics work pull through Dun Huang mural fly format. Descriptive research for designed contemporary ceramics work have been used to analyze collected data analyze interview and content of open-ended question result.

Findings

Research result. From objective to analyze compare between Fei Tian format in Dun Huang mural and Fei Tian painting in contemporary ceramics work. There are some point that related with the usage of curved line and properly shape, the usage of conform direction of movement, the usage of ring area to build unity of shape, the usage of set of color that related with Dun Huang mural in various dimension including the usage of applied auspicious cloud base shape from the primary analysis result bring about to use as a guideline to design contemporary ceramics work. The procedure as following:

The procedure of design and produce the work “Flying Beauty” 1. Designed idea go through the deeply understanding structure of Dun Huang fly format to choose and applied design element is to use decompose and rebuilt to recombine.

First Dun Huang mural of Fei Tian painting have appearance as the following: A) have the unique fly status B) face expression and C) hand and leg posture that is the charming of fly painting. Second point is in every designed of set of fly accessory clothed and ribbon crown need to be conform with fly format and at the end in environment flying character usually have a cold-water fire and cloud painting around It behave is to reinforce the movement and environment of picture. 2. To draft the drawing works, have 5 pieces shape of various size of square Porcelain and rectangle to show Dun Huang mural format. Conservation and 2D contemporary ceramics work format of Fei Tian and flying painting which id drawn on clay board, simple and jolly sign light and relax. This fly painting on Dun Huang mural show and the combination of contemporary ceramics work seems like have some conform can extremely use ceramic material to show charming of fly painting and ceramics color coat test in text appearance worked for create delightful and good-looking color of fly painting. It's not just made fly painting have modern shine but also reflect beauty of contemporary ceramic.

Designed and produce work draft “Flying Beauty” first point is draft drawing in local and element of fly format of Dun Huang mural use decompose procedure and rebuild to recombine, Second point is five fly drawing on clay board that have different size and posture, and at the end the most proper high temporary color coated have found and pass the color pairing examine and proceed coating.(Table 3)

Designed and process of doing “Flying Beauty”. Adjust clay sheet first we must adjust size of four to five clay sheet. Ingredients choose different color powder with water and white clay to mixed to

be cosmetic then add proper quantity of quartz sand. The chosen of coated and examine the chosen of coated are very complicated type and high temporary color coated is more slimy so it's not stable and considering about the effect at the same time. Otherwise, we have to understand coated process and bold level to understand the coated. Color test first color examine every color including strong clear can clearly see in color level also the quartz sand added. Present the effect of frost but green and yellow aren't the ideology so decided to use these two colors in the second generation of color of examine that adjust warm red mustard yellow and bright green that adjust into better shade from first generation. (Table 4)

Table 3. Display result frame designed drafted designed and produce "Flying Beauty"






Frame designed	Drafted designed	Produce "Flying Beauty"
 <p>The color paring examine of "Flying Beauty"</p>	 <p>Some part of sketch of "Flying Beauty"</p>	 <p>Generally rendered of "Flying Beauty"</p>
<p>Forming procedure: clay sheet forming Work size: Porcelain plate 1: 48×30×2 (cm) Tile plate 2: 23×30×2 (cm) Tile plate 3: 56×80×1 (cm) Forming procedure: clay sheet forming Decorate procedure: cosmetic soil, high temporary coated, curve out coated.</p>		

Table 4. Process of produce

Process	Picture data	Conclusion
Clay sheets adjust	 <p>Soil grain "Flying Beauty"</p>	First have to adjust size of four to five sheets clay sheet to 80% of shrink rate to avoid size of mistake
Ingredients	 <p>Ingredient of "Flying Beauty"</p>	Choose different toner color Mixed with water and highly white clay to make cosmetic soil mixed ratio is 1:3:2 then add most proper quantity quartz soil.











Process	Picture data	Conclusion
The chosen coated	 	<p>The chosen of coated are very complicated type and high temporary color coated is slimier so it's not stable and considering about the effect at the same time. Otherwise, we must understand coated process and bold level to understand the coated.</p>
Color test 1		<p>First color test compares between all color and color shade you can see color level and frost effect obviously stronger of added quartz sand bur green and yellow aren't proper so decided to use second version.</p>
Color test 2		<p>In second color test have adjust warm red mustard yellow and bright green that adjust into better shade from first generation</p>
Local show		
	First part of "Flying Beauty"	First draft of "Flying Beauty"
Local show		
	Second part of "Flying Beauty"	Second draft of "Flying Beauty"
Local show		
	Third part of "Flying Beauty"	Third draft of "Flying Beauty"



Figure 1. last show of work process
Source: Kun Li

Conclusions and Discussion

The applied of China's Dun Huang mural from Tian Fei painting in contemporary ceramics product design. The research objective is to analyze comparing between Fei Tian painting in Dun Huang mural and Fei Tian painting in contemporary ceramics work and to use as contemporary ceramics designed model. Dun Huang mural fly format continuously improve in the difference communication of age and combine with local culture absorb China and western culture essence and continuously full of culture and evolution connotation featured with thought and spirit of learning and unique China value system from format posture and color display of Dun Huang mural Fei Tian painting. It's not just indicated livelihood and tendency beauty of human, but also clear indicate the religion spirit and aesthetics thought.

Evolution of Dun Huang mural fly format. The original is from spread of India legend often show thought range that people deeply desire, so her same design become China and World culture value treasure in ten of thousand years history dynasty fly painting of Dun Huang mural improve process start from keep important part to appearance of time collecting got the exhaustively and fully conclusion for evolution fly format history in ancient history.

The work that shows on this paper is "Flying Beauty" use high temporary color coat to designed contemporary ceramics product to show fly format of Dun Huang mural. It seems like that two to three lines or groups of color block are simple and flexible. The trouble in real produce is very huge need a good understanding of fly format and shape, ribbon changing and another element to adjust. Fly format of Dun Huang mural is a substantial language. High temporary color coating in contemporary ceramics product design is to show the determine example impressionism contemporary ceramic art oil painting and fly format are China's value treasure of art. This invent have combine two things together combine fly format by contemporary ceramic work and extend art expression and fly format.

For more art expression in contemporary ceramics product need to continuously thing about combination of fly format and contemporary ceramics work. In ceramics material survey that conform with fly format in contemporary ceramics product, The way to infiltrate shape and color of traditional fly painting in contemporary ceramics product design to reflect the mood spirit and thought of country are the problem that designer needs to concern. The point of China's traditional fly format that will combine with contemporary ceramics product design is to deeply understand China's traditional fly format base on the fusion pull out main point from traditional fly format to be the base and beauty of contemporary ceramics design and high performance produce process and deconstruction to make a divisibly combination So we can invent feel of age and unique of country contemporary ceramics product design.

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Analysis of the Composition of Traditional Village Image from the Perspective of Cultural Landscape - A Case Study of Villages in Huanghe Valley in Western Henan Region, China

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ABSTRACT

At present, the image protection and renewal of traditional Chinese villages often remain at the level of architectural preservation, which has led to the phenomenon of constructive and protective destruction. The main problem lies in the fact that only material protection is carried out, while the overall correlation of village space and the cultural and social behaviors behind the space are lacking in value recognition. The purpose of this study are: 1) To study the characteristics of cultural landscape elements that are related to the traditional rural image. 2) To analyze the characteristics of the elements and problems of the cultural landscape image, in order to protect and develop the ancient village image. 3) To create new spatial design innovations and produce a guide for relevant departments in the conservation and development of the cultural landscape image. Therefore, this study adopts a qualitative research method to analyze the composition of traditional village images in Huanghe valley in western Henan region from the perspective of cultural landscape. There are three stages :1) To explore the problem of traditional villages at the national and provincial levels; 2) Literature review, field literature, and data collection in various aspects; 3) Data analysis to find out the overall elements of the village and formulate guidelines to innovate the rural space design. The results show that the image composition of traditional villages in Huanghe valley in western Henan region can be understood as a composite system composed of layout space image, street place image and landmark node image. The images of the three spatial carriers are independent of each other and convey different immaterial meanings through different spatial representations. At the same time, the three spatial carriers are linked to each other when forming the overall image of the village. This kind of cognition can be used as the basic premise for the protection and renewal of traditional village images.

Keywords: Cultural landscape, Huanghe valley, Traditional village in western Henan region, Composition of image

Introduction

Traditional villages, also known as historical villages, have become important objects in the international heritage protection system. In China, "traditional villages" is a specific term. Since 2012, the Chinese government has announced five batches of 6,819 villages that have been included in the "List of Traditional Villages" and have been protected as objects. The essence of the protection of traditional villages is to protect the image of traditional villages, and to retain the local genes and regional culture of the villages by continuing the image of traditional villages. At present, around the protection of traditional village imagery, there are methods such as the delineation of the protected area, the overall protection of the environment, the continuation of the pattern and texture, the renovation of buildings in key areas, and the protection of intangible cultural heritage. But existing methods remain on the surface of "visible objects", ignoring the cultural mechanisms that actually lead to these sights. In recent years,

many traditional village images have been protected and updated without clarifying the meaning and positioning of the protection objects, and they have rushed to put forward "strategies" for protection, which has actually resulted in constructive and protective damage (Xiao, 2012). In particular, the blind pursuit of "historical features" and "cultural characteristics" has caused many traditional village images to gradually lose their historical authenticity and cultural seriousness. Therefore, this paper hopes to introduce the theoretical perspective of cultural landscape, and take the traditional villages in Huanghe valley in western Henan region as the research object to re-examine and sort out the composition of traditional village images and the corresponding relationship between image carriers and "spatial representations". It provides new ideas for the cognition and protection of traditional villages in Huanghe valley.

Literature Review

1. Traditional Village Image Elements

Image is the unity of subjective spiritual perception and objective external image, and is the result of the two-way process (Liu, 2021). The reason why people can remember and recognize the environment is because the recognizable features of the surrounding environment can be reproduced in the human mind, and the reproduced image is called "image" (Li, 2007). According to Kevin Lynch (2001), image is composed of personality, structure and connotation, that is, landscape imagery has identifiability, connection with material space and implicit connotation. At present, the research on the composition of village image mainly focuses on the extraction of types and classification features of village image elements. According to the division principle of "material-connotation", the composition of traditional village image elements can be summarized as material image elements, behavioral cultural elements (Wu, 2015). Through the combination of different image elements, the overall image of the traditional village is finally constructed.

2. The Composition of Traditional Village Image from the Perspective of Cultural Landscape

The concept of cultural landscape comes from cultural geography, and its essence is a scene that presents people and objective nature, landscape thought and practice. As a methodology, the core idea of cultural landscape is to analyze and interpret the meaning of landscape formation from a cultural perspective, so as to bridge the traditional binary contradictions between nature and man-made, material and value, history and modernity (Xiao, 2015). From the perspective of cultural landscape, the composition of traditional villages is a complex relationship between landscape and culture, and is a landscape object formed by the arrangement and combination of visible landscape elements in the corresponding spatial carrier level according to invisible cultural relations (Xiao, 2014). Based on this understanding, traditional village image can also be seen as a combination of material imagery elements (environment, architecture, streets & square) and non-material imagery elements (traditional culture, social behavior, environmental perception) in space carriers (layout space, street place, landmark node) (Figure 1). Through the analysis of the carrier image of the village space, it is possible to reveal the "form-meaning" correspondence between the material image elements and the non-material image elements at different spatial levels, and then have a new understanding of the composition of the village's overall image.

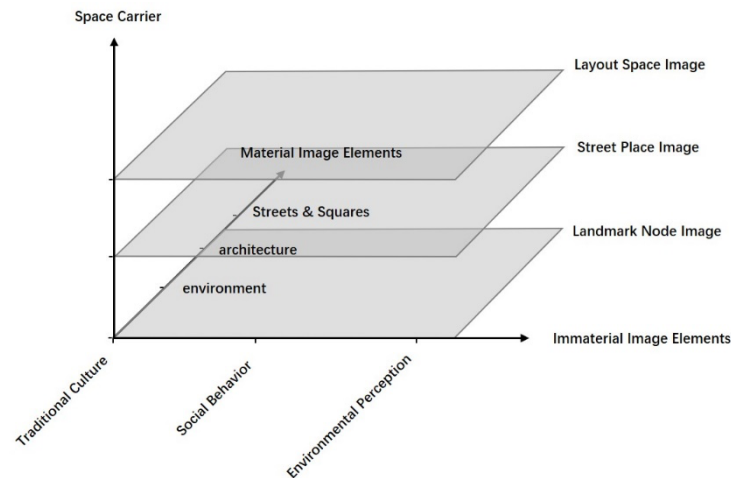


Figure 1. Image element model of traditional villages from the perspective of cultural landscape
Source: Sai Yin

Research objectives

1. To study the characteristics of cultural landscape elements that are related to the traditional rural image.
2. To analyze the characteristics of the elements and problems of the cultural landscape image, in order to protect and develop the ancient village image.
3. To create new spatial design innovations and produce a guide for relevant departments in the conservation and development of the cultural landscape image.

Research methodology

This research is a qualitative research, based on the theory of "material-connotation" integration of cultural landscape, to analyze the composition of traditional village images in Huanghe valley in western Henan region. It can be divided into the following three steps:

1. Take the typical villages in the existing national and provincial traditional village lists in western Henan as the research object, and fully consider the different administrative regions and landform types of the villages. Finally, 9 villages including Dajindian Laojie Village, Jinmenzhai Village, Houshangzhuang Village, Dawangmiao Village, Youfang Village, Baisha Village, Ganquan Village, Weipo Village and Siposhan Village were selected as research samples.
2. Through field inspections, literature review, interviews and other forms, collect basic data such as natural conditions, social history, village plane maps, streets and building layout information in the village samples.
3. Analyze the data, extract the material image elements and intangible image elements of the village image, analyze the "space surface signs" and intangible connotation of the element combination in the space carrier image, and finally summarize the overall imagery composition of the village.
4. Summarize the innovations in the protection and renewal of traditional village images from the perspective of cultural landscape.

Findings

1. Extraction of Image Elements of Traditional Villages

According to the classification method of traditional village image elements mentioned above, the material image elements of the village can be divided into environment, architecture, street & place space, and the immaterial image elements can be divided into traditional culture, social behavior, and environmental perception. By summarizing and summarizing the data of the nine traditional village sample surveys according to this classification, more detailed sub-categories of traditional village image elements in Huanghe valley of Western Henan region can be extracted, as shown in Table 1.

Table 1. Extraction of sub-categories of traditional village image elements in Huang He valley of Western Henan region

	Image Element Categories	Image Element Subcategory
Material Image Elements (Visible)	environment	the external environment of the village, the internal environment of the village
	architecture	buildings, structures, courtyards
	streets & squares	street, square
Immaterial Image Elements (Invisible)	traditional culture	history culture, habitat culture, functional culture, spiritual culture
	social behavior	neighborhood life, folk activities, ritual activities
	environmental awareness	atmosphere perception, folk customs

Source: Sai Yin

2. The Image Composition of Different Spatial Carriers of Traditional Villages

The extracted subcategories of different image elements were combined in three spatial carriers, namely layout space, street place and landmark node, and the "form-meaning" relationship of the combination of material image elements and immaterial image elements in each spatial carrier was analyzed.

2.1 Image Composition of Layout Space

On the layout space carrier, the combination of image elements forms the environment layout and functional layout of the village. The environment layout reflects the spatial relationship between the village and the external environment, and is the response of the ancient ancestors to the natural environment when they chose their place of residence. The site selection of traditional villages in western Henan is carried out under the traditional Feng Shui concept of "Back against the mountain, holding the water, and facing the screen". According to the survey of village samples, there are three common types of landscape layout in traditional villages in western Henan, namely river-side type, mountain-backed water type, and mountain-surrounded type, all of which are in line with the concept of Feng Shui. Among them, Baisha Village is the river-side type layout, Houshangzhuang Village is the mountain-backed water type layout, and Siposhan Village is the mountain-surrounded type layout (Figure 2).



River-side Type
(Baisha Village)



Mountain-backed Water Type
(Houshangzhuang Village)



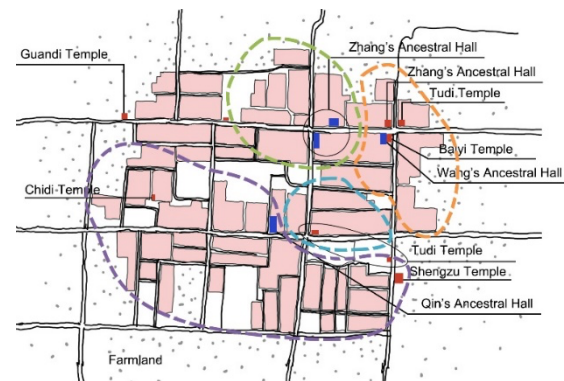
Mountain-surrounded Type
(Siposhan Village)

Figure 2 The composition of the environment layout of the village
Source: Sai Yin

The functional layout is composed of the external environment of the village, the internal environment of the village, buildings and streets, which reflects the dominant influence of functional culture on the formation of the internal structure of the village. According to the sample survey, the vast majority of villages in western Henan are farming-type villages that mainly live in farming, and a small number are commercial-type villages developed for commerce. Farming-type villages were formed on the basis of blood-based village nuclei in the early stage. In the later period, with the increase of population and the immigration of foreign groups, a pattern of multiple nuclei was usually formed, so the functional layout was a cluster-type layout; Commercial-type village is a village developed along a commercial road, with a strip-shaped commercial street as the main development axis, so the commercial-type villages are mostly linear in functional layout. In this survey sample, Dajindianlajie Village has a linear layout, with shops, residential areas, and guild halls distributed on the strip-shaped commercial street and its sides. Youfang Village has a cluster-type layout, with multiple ethnic groups forming different residential clusters, surrounded by farmland, and ancestral halls and temples embedded in different clusters (Figure 3).



Linear Layout (Dajindianlaojie Village)



Cluster-type Layout (Youfang Village)

Figure 3. Functional layout of villages
Source: Sai Yin

2.2 Image Composition of Street Places

On the street place carrier, the combination of image elements forms the street functional space and street visual space of the village. The street functional space reflects the combination of streets, squares, buildings and structures. Through the series function of the streets in the village, it can form the stage of daily life such as street space, street-side space and street gathered space (Moughtin, 1978). According to the survey of sample villages, the street space of traditional villages in the Yellow River Basin of Western Henan has different scales and uses. The main street of commercial villages or large villages can reach 5-9 meters, which can meet the needs of a large number of people, trade activities, temple fairs and festivals. The secondary street is 2-4 meters, suitable for neighborhood activities such as walking and talking; the street-side space is often located on the side of the street, mostly the well or idle land in the village, providing the best place for the villagers to rest and chat; There are many forms of street gathered space, in some villages, buildings or structures are set up in the middle or above the street to form a small gathered space, and there are also small squares in front of public buildings to meet crowd gathered.

The street visual space is composed of the external environment of the village, the internal environment of the village, buildings, structures, streets and squares, it mobilizes almost all the material image elements and is the most important channel for the formation of the "sense of atmosphere" in the village. The street visual space of traditional villages in western Henan includes street interface, street outline and street space level. The interface of the street is the ground, facade and sky that affect the visual perception of people when walking on the street. The impression of the street interface is mainly through the style and shape of the gate, the decoration of the eaves, the facade material, the ground pavement, the ground height difference and to express. The street outline and street space level are the product of the combination of the street's interface and the village environment, which is a dynamic image perception. The street outline is formed by the building outline, walls, trees, and mountain views, the street space level is the relationship between the distance and volume of various landscapes. When people walk in the village, buildings and sites of different proportions expand and contract in the flowing path, and the outline and level of the street also continuously change with the perspective, forming a dynamic perception experience (Figure 4).



Street Interface
(Weipo Village)



Street Outline
(Jinmenzhai Village)



Street space level
(Ganquan Village)

Figure 4. The visual space composition of the street in the village
Source: Sai Yin

2.3 Image Composition of Landmark Nodes

On the landmark node carrier, the combination of image elements forms the landmark space and node space of the village. The landmark space reflects the spatial combination of important buildings and squares in the village in a comprehensive environment, it is the focal point of the landscape sight in the village, and it is also a place to demonstrate functions, social relations and value beliefs. Landmark

spaces show existence through location, scale and form. The location of the landmarks reflects the importance of the landmarks, the landmark spaces (temples, Taoist temples, guild halls, shops, ancestral halls, etc.) of traditional villages in western Henan are often distributed in the center of the village space or at the heights of the terrain on the edge of the village. The scale and form of a landmark are the external visual features of the landmark space, generally speaking, the scale of the landmark space is larger, and its physical features and decorative elements are more abundant than ordinary dwellings, which highlights the status of the landmark as a spiritual symbol.

The node space is a combination of buildings, streets and squares in a comprehensive environment, unlike the landmark space, the node space is more for identifying the location of the space rather than showing individuality. The node space of traditional villages in western Henan is mainly the wells, bridges, pavilions and other structures in the village, and also includes the square nodes under the big trees in the village. In terms of location, the node space is often distributed at the intersection of important spatial structures such as the entrance and exit of the village, the official road, and the riverside. The form is not deliberately exaggerated, but shows a simple rural construction method.

In the spatial distribution of landmarks and nodes in Dawangmiao Village, it can be seen that the Dawangmiao Theater is located in the center of the northern terrace of the village as a landmark, it is different from other dwellings in both scale and shape. There are two stone bridges and two wells with pleasant scales and different shapes. These landmarks and nodes together demonstrate the local temperament and spiritual pursuit of the farming-type village (Figure 5).



1 Dawang Temple Stage 2 Wawa Bridge 3 Wenqu Bridge 4 Well 1 5 Well 2

Figure 5. The landmark space and node space of Dawangmiao Village

Source: Sai Yin

3. The Overall Image Composition of Traditional Villages

In the above, the traditional village image is graded and analyzed from the three spatial carrier images of layout space, street place, and landmark node, in order to clarify the corresponding relationship between the combination of elements and the immaterial connotation in different spatial carrier images. But in fact, each carrier image does not exist in isolation in the overall village image, but intersperses, transforms and influences each other. Therefore, the images of traditional villages in Huanghe valley in western Henan region can be understood as a complex system. On the one hand, the three spatial carrier images are independent, and convey different immaterial meanings through their different spatial representations. On the other hand, the three spatial carrier images are related, and different image elements echo and reinforce each other in different spaces, forming the overall image of the village (Figure 6).

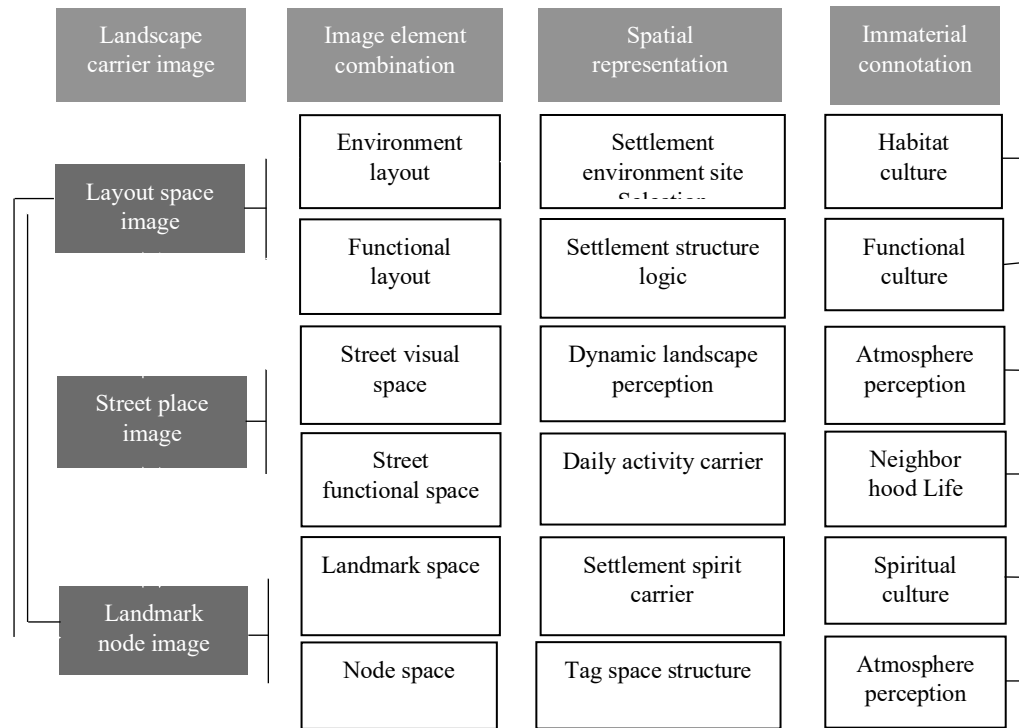


Figure 6. Frame of the overall image of traditional villages in Huanghe valley in western Henan region

Source: Sai Yin

4. The Innovation of Traditional Villages Under the Perspective of Cultural Landscapes

The perspective of cultural landscapes provides us with a new perspective for us to re-understand the traditional village imagery, and it also provides new ideas for the protection and update of traditional villages. Although there is no new breakthrough in the protection technology, as a systematic idea, the cultural landscape perspective can provide a complete theoretical solution for traditional villages' image protection and updates from the cognitive level and method level (Table 2).

Table 2. Cultural landscape perspective below the village image protection and update innovation

	Theoretical cognitive level	Update design method level
Old village image protection and update perspective	- Pay attention to key buildings and ignore the environment	- Rigid delineation layout space protection scope
	- Pay attention to "visual harmony"	- The streets are repaired and transformed to the same standard of regularity
	- The village as an object of curiosity for tourists	- Landmark node carried out travel development alone
	- Concentrated protection for intangible cultural culture	

	Theoretical cognitive level	Update design method level
Cultural landscape village image protection and update perspective	<ul style="list-style-type: none"> - Joint protection of architecture and space environment - Pay attention to the internal logic and regional characteristics of space - Both indigenous life and tourism development - The inheritance of intangible culture should be carried out with the space carrier 	<ul style="list-style-type: none"> - The protection of layout space should be comprehensive in terms of historical functions, environmental characteristics, and internal order - The streets are not undergoing large -scale demolition, and "historical symbols" are not set, to protect the "authenticity" of the atmosphere - The reuse of landmark nodes should be combined with the original function and spiritual connotation

Source: Sai Yin

Conclusions and Discussion

According to the perspective of cultural landscape, the images of traditional villages in the Yellow River Basin of Western Henan have the characteristics of unity of material and connotation, that is, each space carrier image has a specific spatial representation and corresponding immaterial image connotation:

1. The image of layout space is mainly reflected in the level of environment layout and functional layout. At the level of environment layout, the environmental location of the settlement under the concept of Feng Shui is used as the spatial representation form, and the connotation mainly reflects the habitat culture; at the level of functional layout, the generation logic of the settlement structure guided by the cultural mechanism is used as the spatial representation form, it mainly reflects the functional culture.

2. The image of street place is mainly reflected in the level of street visual space and street functional space. At the level of street visual space, the dynamic landscape perception of the street interface, street outline and street space level is used as the spatial representation form, and the connotation mainly reflects the perception of atmosphere; at the level of the street functional space, the daily life content connected by the street is used as the spatial representation form, mainly reflects the neighborhood life.

3. The image of landmark nodes is mainly reflected in the level of landmark space and the node space. At the level of landmark space, the symbolic meaning of the settlement spirit conveyed by landmarks is used as the spatial representation form, and the connotation mainly reflects the spiritual culture; at the level of node space, the marking of the spatial structure by nodes is used as the spatial representation form, and the connotation mainly reflects the atmosphere perception.

In the overall image of a traditional village, the image of the layout space, the image of the street place and the image of the landmark node are linked to each other. If a certain carrier image element changes, other parts of the landscape image will have a corresponding positive or negative impact.

Compared with the old view of village protection, the research on the image of traditional villages in the Yellow River Basin of Western Henan Province from the perspective of cultural landscape puts forward new ideas from the level of theoretical cognition and the level of updated design methods. To do in-depth study of village image formation, extracted from the vector space representation must be followed in landscape connotation as a development context, then based on the connotation of the value of the image updates, rather than stay in the "history" and "culture" the blind pursuit of, should be gradually put an end to "a constructive and protective destruction" phenomenon. At the same time, the

idea of cultural landscape should be implemented in the village protection plan formulated by the government, and design guidelines should be formulated to systematically guide the design innovation of traditional space.

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Chinese lacquerware and design dimensions of contemporary lacquerware

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ABSTRACT

The objectives of this research were 1) Study the patterns and techniques of lacquerware in Chinese culture, as well as the production methods of traditional lacquerware. 2) Analyzing the technological factors in the development of contemporary Chinese lacquerware product design, 3) Contemporary lacquerware design reflects the inheritance culture of pattern culture and contemporary technology. Using qualitative research methods, operate by studying the information in the references. Field investigation, including participant observation and non-participant observation, expert interviews, and analysis of design data through descriptive analysis.

The results indicate that the modernization of contemporary lacquerware represents significant progress in the utilization of irreplaceable raw materials such as raw lacquer. The complex and time-consuming lacquerware process requires precise refinement, which machines cannot replace. This aspect is crucial for protecting tradition, as it can be strengthened but will never be replaced. In the development process of lacquerware, these challenges were encountered because its creation is essentially product design. However, unique materials and processes often obscure its purpose, leading people to overlook its practical functions. Previous lacquerware works mainly focused on artistic forms or craftsmanship, emphasizing the display of their identity. However, as a product, its functionality holds significant importance. If we only focus on materials, processes, and other performance aspects, we may lose the true essence of product design. Therefore, the development of contemporary lacquerware needs to focus on practicality and functionality, reflecting the demands and current trends in this field.

Keywords: Lacquerware in Chinese culture, Design dimensions of contemporary lacquerware, Utility lacquerware

Introduction

Lacquerware art is a traditional art and culture with a long history in China, which has been passed down from ancient times to the present day. Through its artistic charm and practicality, it has been demonstrated in historical changes. Lacquerware art includes lacquerware, lacquer painting, lacquer carving, etc. However, in traditional lacquerware art, lacquerware is almost synonymous with traditional lacquer art, mainly presented through physical objects and literature materials.

The development of lacquerware is the focus of lacquer art development, which determines whether lacquer art can be accepted by a wider public. At present, the representative of lacquer art is lacquer painting. Although lacquerware also belongs to lacquer art, the promotion effect of lacquerware is not as good as lacquer painting, because only when the audience becomes the public can the acceptance be improved. The social awareness of lacquerware needs to be improved. The quality of lacquerware needs to develop in the right direction, and this process requires studying the artistic and cultural characteristics of traditional lacquerware. With the rise of the information society, people are paying more and more attention to imagination and creativity. In this context, traditional culture has attracted people's attention as a key element of imagination and creativity (Song&Kim, 2019). Study the

current situation of contemporary lacquerware, seek the development direction of lacquerware, and outline possible methods. Although lacquerware belongs to the category of traditional art, it can be modern in design, aesthetics, form, and function. It should pay more attention to the development of modern traditional lacquerware, using modern design concepts and aesthetics to create products that meet the needs of modern society and contribute to the development of lacquer art.

With the development of lacquer art, the practical functions in traditional arts and crafts have been neglected. The development of technology is slow, and its expression cannot reflect current aesthetic taste. The existence of these factors has led the contemporary lacquerware industry to urgently seek solutions and directions for lacquerware development.

Lacquerware art is not singular and standardized (Cui, 2016). When expressing oneself, it cannot be firmly maintained within certain boundaries. As it becomes increasingly known, it is necessary to break through traditional limitations and present a variety of visual aesthetics through graphic elements, materials, colors, and other decorative effects (Che&Lu, 2009). The technique used in this process is the creation of modern art. If traditional lacquerware wants to revive, it must constantly absorb new factors to enrich itself.

Research objectives

1. To study patterns and techniques of lacquerware in Chinese culture and methods of producing traditional lacquerware.
2. To analyze the technical factors used in the development of Chinese contemporary lacquerware product design
3. To design contemporary lacquerware reflects the inherit culture of pattern culture and contemporary technique

Literature review

In ancient times, in the process of understanding and transforming nature, people discovered that natural resin cut from lacquer trees was a very good coating. It not only had anti-corrosion properties, but also made objects beautiful. The mulberry wood "lacquer bow" unearthed at the Kuahuqiao Cultural Site in Xiaoshan City, Zhejiang Province is a beautiful handicraft, and some of the skin was removed after physical and chemical analysis by Professor Nakamura. The remaining black part has been confirmed by Japanese archaeologists as natural lacquerware (Figure 1), which is the oldest surviving lacquerware in the world and confirms that Chinese lacquer art has a history of over 8000 years, more than a thousand years earlier than the known history. A red lacquered wooden bowl with a history of over 7000 years was discovered at the Hemudu Cultural Site in Yuyao, Zhejiang in 1978 (Figure 2). The above archaeological discoveries indicate that our ancestors began to discover and use lacquerware long before the recorded history.



Figure 1. Lacquer Bow of Cross-Lake Bridge Culture
Source: Zhejiang Collection of Cultural Relics



Figure 2. Zhejiang Hemudu Red Lacquer Bowl
Source: Zhejiang Collection of Cultural Relics

During the Spring and Autumn and Warring States periods, lacquerware began to replace bronze during the Qin and Han dynasties. The craftsmanship of lacquerware has reached a high level and

occupies an important position in the lives of the nobility during the Three Kingdoms, Wei Jin, and Southern and Northern Dynasties (Liu, 2015). The production of lacquerware became increasingly advanced, and the shapes of vessels became more diverse. With the introduction of the Sui and Tang dynasties, craftsmen transformed the lacquerware craftsmanship based on the inheritance of previous lacquerware techniques. The ruling class of the Song Dynasty established a specialized institution to supply lacquerware for the royal family. At the same time, local governments also emerged in the lacquerware industry, and lacquerware technology flourished under the joint cultivation of official and private markets, and then appeared in many works passed down from generation to generation. From the Yuan Dynasty to the end of the Ming Dynasty and then to the Qing Dynasty. The lacquerware craftsmanship has further developed, and a large number of famous masters have emerged. The outstanding artists in Huang Cheng's "Xiu Shi Lu" summarized a complete set of craftsmanship experience, which had a great influence on future generations. Lacquerware has a cultural heritage history of thousands of years, conveying a cultural atmosphere of continuous inheritance and development of tradition.

Modern theoretical research literature is more comprehensive than before. This includes not only technical research, but also various aspects of lacquerware products such as creation, design concepts, aesthetic needs, investigation of lacquerware language, and cultural properties. These theories have a guiding role in the development of contemporary lacquerware.

The related concepts of traditional lacquer art, such as the materials used in production, practical value, and aesthetic value, have had a huge impact on the design of contemporary lacquerware products. The use of traditional lacquerware techniques and materials in the design of modern lacquerware products contributes to the development of traditional handicrafts in modern society. In addition, the combination of traditional lacquer art and modern lacquerware product design brings comfortable texture and unique aesthetics to lacquerware products, enhancing the design quality of lacquerware products. Therefore, in the process of designing modern lacquerware products, there must be a concept of design aesthetics to ensure that lacquerware products are consistent with modern aesthetics.

Studying the development of traditional Chinese lacquerware is to transform the lacquerware design pattern into a combined design pattern of art and commercial products in modern society. From a design perspective, the working style, symbolic meaning, and colors of traditional lacquerware have research value. The future development trend is to combine traditional lacquerware with practical production and use and incorporate modern design concepts.

Research methodology

The researcher studied relevant research and literature in this research project and used a qualitative method appropriate for art research to examine the current situation of lacquerware display design. In addition, descriptive analysis is used to examine ancient Chinese art forms. In the following order

Descriptive analysis. The researcher collects and analyzes traditional lacquerware and contemporary lacquerware in museums, private studios, exhibition halls and other places. To study the special characteristics, characteristics of the era, materials, and traditional techniques. Lacquerware has made a great contribution to the study of art. These data can be followed to get theoretical support. The steps are as follows:

1. Gather and study literature and books about the design of lacquerware. Learn and gather information from research.
2. Fieldwork to collect the data. Most field surveys and research are in universities with outstanding lacquerware products, lacquerware representative studios, related institutions etc.,. The most direct data were obtained from these places, whether it was the artistic creation of lacquerware in universities or folk lacquerware produced mainly from handicraft materials. The following methods were used for field surveys:

2.1. Interview method. Based on expert interviews, using inviting experts and insiders to examine the process techniques of lacquer art, development trends, design concepts, product design, product relations, beauty and lacquer art, and other aspects in the form of content discussions. Such interviews in order to provide more direction can provide a more in-depth analysis of the research project.

2.2. Observation method. For example, field investigation method, literature review method, and data method. Simultaneously using observation methods, mainly observing lacquerware and image materials.

2.3. Data analysis. Most of the information is conceptual, comparing concepts and theories.




3. Summarize the research results on the role of modern art concepts in contemporary lacquerware design.

Findings

This research analysis indicates that China was the first country in the world to create and use lacquerware. Lacquerware works have a long history and come from archaeological discoveries of different eras. The traditional lacquerware of the Han Dynasty gradually improved, reflecting the creations of different historical periods and introducing different regional cultures and technologies, indicating that lacquerware craftsmanship is deeply rooted in Chinese history and culture. The development of modern lacquer art cannot be separated from the foundation of tradition and traditional craftsmanship, and must be carried out on the basis of inheriting traditional lacquer art. However, it is important to note that it should not be limited to tradition (Qi&Liu, 2014).

Contemporary lacquerware has added modern concepts to modeling, which is relatively simple, whether it is lacquerware or bamboo lacquerware, it depends on the succession of materials and techniques and changes according to design requirements, For example: the surface of the flower device is pushed and painted, to process the geometric plane, and the colored cup deliberately maintains the fluctuation of the bamboo. Finally has a variety of texture effects when grinding the paint box is not coated. And the traces of bamboo roots are preserved after lacquering, there will be a massive color change. These works are based on inheritance and are not bound by tradition (Table 1).

Table 1. Analysis of lacquerware product design dimensional




Analysis of lacquerware product design dimensional				
Lacquerware Figure	Material	Shape	Production	Usage
 Figure 1 Liang Yuan Lacquerware Works	- raw lacquer - linen - transparent black lacquer	A circle in the middle of the table and there is a traditional Chinese model creation element.	- paint - drawing - decoration - crush - push	- flower - decoration
 Figure 2 Wang Boyang's Lacquerware Works	- raw lacquer - bamboo - transparent lacquer	Simple shape, no too much decoration	- paint - cloth / mashed / push - clean	- colored cup
 Figure 3 Wang Boyang's Lacquerware Works	- raw lacquer - transparent lacquer - bamboo root	the shape of the box is strange and original.	- paint - wrinkle/ crush/push/wash	- color box

Lacquer art has been influenced by thousands of years of traditional lacquer art techniques, which have been inherited from traditional development, continuity, and respect for ancestors. In recent years, there has been a growing interest in cultural and artistic education (Marie, Arnold Thi&Nina, 2022). This provides great continuity and similarity for Chinese art and design. Usually, certain shapes, forms, or artistic designs that have appeared in history will be used by future generations. This phenomenon also exists in contemporary Chinese lacquerware, but there has been almost no progress in terms of design and decoration. The art of contemporary lacquerware artists requires a more complete medium and expression form to reflect and convey the design and creation of lacquer artists. In recent years, the industry has recovered. Traditional lacquerware art is flourishing and becoming more colorful. Lacquerware art is diverse and comprehensive, and the concepts of the works are novel and have been elevated under the guidance and design concepts of lacquer art industry experts. Appreciating the aesthetic and technological advancements of practitioners has become an important trend influencing the development of modern art concepts in lacquerware, mainly reflected in the following aspects.

1. Expand and explore lacquer painting materials and techniques.

The use of lacquer materials does not exist in isolation, as it allows contemporary lacquer artists to express their artistic concepts more freely and examine the spiritual essence of lacquer hidden within the art of lacquer. Lacquer art began to explore various materials, and "covering" lacquer art is made from various paintable materials, emphasizing the modernity of lacquer language style. For example, the lacquer works created by lacquer artists Cheng Xiangjun, Tang Mingxiu, Zhang Zeguo, and Huang Weizhong have made lacquer materials the core of reviving the language of lacquer art. The creations of these lacquer artists have played a good exemplary role in the integrity and diversity of lacquer art. In the language of lacquer art, this change is not only reflected in lacquer paintings, but also in lacquerware works (Table 2).




Table 2. Xiangjun lacquer, Tang ming xiu jinyi, Huang weizhong mountain and water

Lacquerware Figure	Material	Craft	Lacquer language performance
 Figure 1 Cheng Xiangjun, Paint Language	<ul style="list-style-type: none"> - linen - raw lacquer - transparent lacquer 	<ul style="list-style-type: none"> - scrape - painted 	Promote the freedom of expression of abstract principles. Completing the structure and restructuring of lacquer art from the basic language of lacquer painting to the comprehensive language of lacquer painting, the image was transferred to the thick lacquer, and a large amount of wax silver foil was used as a surface, breaking the aesthetic limitations of traditional flat lighting and experimenting with the abstract expressionism of lacquer painting.
 Figure 2 Tang Mingxiu, Brocade Clothes	<ul style="list-style-type: none"> - linen - raw lacquer - black lacquer - pigment - aluminum foil 	<ul style="list-style-type: none"> - painted - wax silver foil - crush - scrape 	Lacquer painting scope division and painting introduction, extensive material and extensive humanistic emotional factor. Focuses on rendering the beauty and spirit of the extensive material in lacquer painting, and form its own personality from aspects of technique, material and artistic conception.
 Figure 3 Huang Weizhong, Mountains And Water	<ul style="list-style-type: none"> - plank - black - clear lacquer - silver foil - wood chips - pigment 	<ul style="list-style-type: none"> - painted - wax silver foil - polished - grind - wash 	High refinement, generalization, bold exchange, deformation, enrichment in simplicity, pursuit of change in monotony, strengthening the expressiveness of lacquer painting.

2. Shape design and development.

Art should inherit tradition, but not be too rigid. It also needs to draw on other forms of art, imitate but not simply imitate. It must have its own ideas and innovations in lacquerware design. Shape design is the main element of this form. According to the function of lacquerware, it is necessary to meet the requirements of comfort and safety. If contemporary lacquerware can make the shape perfect and original, it depends on the designer's understanding, preference for beauty, and imagination of the shape. And it is necessary to maximize artistic creativity, express personal emotions through appropriate processes, and convey a sense of modernity and traditional emotions to people. (Table 3).

Table 3. Lacquerware products.


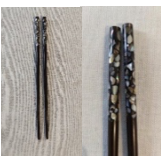

Lacquerware Figure	Characteristics of shape
 Figure 1 Works By Guo Xiaoyi	Plane shape and three-dimensional shape. Consider the utility and art together with the design of contemporary lacquer art which has a beautiful shape.
 Figure 2 Works By Anna	Understand the characteristics of beauty and change the structure of the object. Use general methods to make the body shape easier.
 Figure 3 Works By Zhong Sheng	It is characterized by the transfer of pictograms by filtering out the original object and transferring it to the shape of lacquerware. Feel the meaning, then understand the shape of the object and create a meaningful shape.

3. To fulfill the needs of modern aesthetics and practical.

The development of lacquerware should be adapted to modern society. The design of lacquerware products should start from the concept of modern art design and meet the needs of modern aesthetics and practicality. For art, modernism is an aesthetic principle. When all types of art follow these principles, they become contemporary lacquerware. Therefore, lacquerware has a certain aesthetic similarity with other types of art, which provides the possibility for mutual learning. Lacquerware originated from the folk, and it has both practical functions as daily necessities and surface decoration. The beauty of handicrafts is the standard for measuring 'tools', but beauty also comes from people. Ultimately, it is about measuring people. However, this is just an infinite corner of human vision, which is very complex and not the focus of contemporary artistic spirit. It strongly emphasizes the review and integration of all cultural heritage and spiritual resources according to contemporary standards (Liu, 2005).

Its practicality is also a primitive beauty. Through experience, it can be observed that true practice is rooted in nature. Therefore, when people experience the practicality of a product, it creates a primitive sense of relationship, a sense of beauty (Table 4).


Table 4. Fashionable and practical lacquerware

Lacquerware Figure	Material	Processing	Creative concept
	<ul style="list-style-type: none"> - bamboo rubber - raw lacquer - black lacquer - silver foil 	<ul style="list-style-type: none"> - crushed - silver foil - paint / press / clean 	<p>Through the unique use of lacquer materials and the variety of craftsmanship, many artworks can be produced on the surface of the chopsticks.</p> <p>It produces a mottled and gorgeous visual effect, and the repetitive push of light gives the rough surface a delicate luster and contrasting beauty. The plant lacquer's corrosion resistance, high temperature resistance, non-oxidation, environmentally friendly and healthy make the lacquer have great advantages in practicality.</p>
	<ul style="list-style-type: none"> - rubber - raw lacquer - black lacquer - snail - gray lacquer 	<ul style="list-style-type: none"> - enamel - snail crushed - cinder / scrape - paint / mashed / push-clean 	
	<ul style="list-style-type: none"> - black resin - transparent snail powder 	<ul style="list-style-type: none"> - paint - mashed - snail powder - mashed / push / clean 	

4. The concept of modern art design plays an important role in lacquerware decoration.

Regarding lacquerware decoration, it has important functions in itself, and lacquerware decoration should also become an art form (Li, 2016). The emphasis is on the art of contemporary lacquer artists, most of whom come from higher art institutions. They acquire experienced craftsmanship skills through traditional techniques and embrace modern art design concepts. The work focuses on aesthetics, art, and practice, mainly from an individualistic perspective, combined with modern aesthetic concepts, using materials, colors, and techniques. These artists are more flexible in their creations, and many lacquerware have moved away from the concept of containers and become beautiful works of art. The creation of these lacquerware cannot be separated from higher art and design education. As shown in Table 5, artists have greater flexibility in their creations, and many lacquerware have moved away from the concept of utensils and become truly aesthetically valuable works of art (Table 5).

Table 5. Lacquerware works with modern artistic concept

Lacquerware Figure	 <p>Works by yang peizhang, works by guo xiaoyi, works by zhong shen</p>
Creative concept	<p>Contemporary lacquer works pay more attention to modern lifestyles, focus on beauty and art and practical coexistence, most works from an individual point of view pay attention to the author's personal feelings, combining aesthetic concepts. Modern and personal design style, masterpiece creation techniques, highlighting the expression of thought and taste, reflects the symbolism of traditional Chinese style of allegorical thinking.</p>

From the survey results, it can be seen that studying the patterns and techniques of lacquerware in Chinese culture, as well as the production methods of traditional lacquerware, can help us learn the artistic aesthetics of traditional lacquerware and explore the design principles of practical lacquerware. Analyze the technological factors in the development of contemporary Chinese lacquerware product

design, explore lacquerware materials, attempt to break through the limitations of traditional technology and materials, and use modern design concepts to create lacquerware products that meet modern aesthetic needs. Such lacquerware design can reflect the cultural heritage of contemporary technology.

Conclusions and Discussion

- a) Contemporary lacquerware from the point of view of use is mainly divided into two categories: decorative lacquerware and practical lacquerware.
- b) lacquerware has practical and aesthetic value, its shape can also be divided into practical shape and artistic shape, most of contemporary lacquerware is a work of art, and practical lacquerware is rare.
- c) Researching and exploring material language is a necessary method for the development of lacquerware.
- d) Modern design concepts play an important role in the design of lacquerware, and e) lacquerware with a modern art design concept is a trend of development.

From the point of view of product design, there must be two factors: practicality and beauty, to be called excellent, and lacquerware is a combination of practicality and beauty (Meng, 2006). Furniture design and packaging design are rare in design products. Therefore, there is a high design and research value in applying lacquerware shapes and materials to products and exploring the practical value of lacquerware in modern theoretical research literature. It is more complete than before, not only technical research, but also research on creation, design concept, aesthetic requirements, and exploration of lacquerware language, cultural nature, and other aspects of these theoretical lacquerware products. This has had a guiding effect on the development of contemporary lacquerware.

Contemporary lacquerware tries and uses the artistic language of other types of art, which makes contemporary lacquerware evolve along with its modern nature. Therefore, it is of great importance to analyze traditional lacquerware work through tradition and modernity, form and content for the development of modern lacquerware, a conceptual art, form and aesthetic design that is indispensable to one another. Learn the techniques of artistic expression through various forms and modern designs that blend seamlessly with modern art and the concept of creating contemporary lacquerware. These will give modern lacquerware a higher added value and unique appearance.

Chinese lacquer art has a long history and is unique to traditional Chinese culture. The ancients of every dynasty have left a large number of exquisite lacquer art works, which are clear evidence for the study of ancient lacquer art (Wang, 2015). It is very convenient to inherit the lacquerware art, can learn the shape technique of the object, the color from the object, analyze the use of the material, by learning can realize the natural beauty of the lacquer art material, the beauty of the artificial handicraft and result. To the researcher's opinion, the artistic achievements reflecting the all-encompassing nature of this aesthetic feature gave rise to the appearance of a new era. From the study, the recommendations are summarized as follows.

1. The legacy traditional lacquerware should be combined with modern aesthetics, that means to recreate traditional crafts and to transform, refine and incorporate some elements of traditional culture into modern aesthetic concepts. The art of lacquerware should not be expressed by skill but should contain the spiritual content behind the technology in order to have the traditional humanist spirit of the cultural characteristics and characteristics of lacquerware. The creation must conform to modern design concepts, aesthetic concepts as well as reflect the artistic and creative expression of the era.
2. The use of lacquerware first focuses on practicality. Therefore, the so-called 'practicality is beauty' will only enhance research and practicality (Xu, 2018). The reason why traditional crafts are more vivid is because practicality precedes aesthetics, and practicality and aesthetics are unified. This made ancient China famous for the practical level of lacquerware. Lacquerware art is mainly applied to kitchen and bathroom materials, furniture, interior decoration, ornaments, industrial products, etc. The pursuit of practicality can provide a more complete expression for the development of traditional crafts and other

fields. Using beautiful forms and modern design concepts to make the design of lacquerware products more in line with the aesthetic requirements of contemporary society.

3. The development of lacquerware products should focus on design. Product design should be combined with modern artistic concepts to create lacquerware artworks that are more in line with contemporary aesthetics, more suitable for decoration and styling. In addition, the innovative function of lacquerware products also needs to improve the artistic aesthetic requirements of the products, and the improvement of artistic aesthetics requires long-term cultivation.

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