

From "Intangible Cultural Heritage Protection" to "Space Empowerment": Research on the Innovative Integrated Development of Wine Castle Cultural-Tourism Industry in the Twenty-one Scenic Spots of Ningxia

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Abstract: Against the backdrop of the deep integration of culture and tourism, the dynamic preservation of intangible cultural heritage and the innovative upgrading of the cultural and tourism industries have become central issues driving high-quality regional economic development. The eastern foothills of the Helan Mountain in Ningxia represent an important wine-producing region in China; they serve not only as a key platform for the distinctive cultural and tourism sector under Ningxia's "Six New, Six Special, and Six Excellence" industrial development framework but also as a vital component of Ningxia's "Twenty-One Scenic Spots" cultural and tourism brand. This research takes the Helan Mountain Wine Castle in Ningxia as its subject and employs research methodologies-including literature synthesis, case study analysis, and fieldwork-to systematically examine issues such as the dynamic preservation of intangible cultural heritage within the cellar, the integrated spatial design of its functions, the immersive experience offered to visitors, and the synergistic interaction between the industry and the cultural and tourism sectors. By conducting an in-depth exploration of the intangible cultural heritage embedded in the Ningxia Wine Castle, this research highlights the core themes of dynamic intangible cultural heritage preservation, the integration of industry and culture/tourism, and the harmonious coexistence of humans and nature, thereby fostering high-quality, synergistic development between the wine industry and the cultural and tourism sectors in the eastern foothills of the Helan Mountain, and providing a practical paradigm for the integrated development of Wine Castles and cultural tourism in the inland regions of Northwest China.

Keywords: Ningxia; Integration of Culture and Tourism; Intangible Cultural Heritage Conservation; Space Empowerment

1. Introduction

With the continuous improvement of residents' income levels in China, cultural-tourism consumption concepts have also been constantly upgraded. The traditional tourism model dominated by check-in sightseeing is transforming toward immersive, in-depth and cultural-experience-oriented tourism. During their travels, tourists place increasing importance on cultural engagement, emotional connection, and spiritual enrichment, and they have higher expectations regarding the cultural significance, spatial quality, and experiential value of tourism destinations. Against this backdrop, most research on the preservation of intangible cultural heritage (ICH) has centered on static aspects—such as cultivating inheritors, establishing protection inventories, and refining relevant safeguarding policies—primarily focusing on the conservation and preservation of ICH resources. This Research, however, expands the scope of ICH preservation research beyond traditional perspectives by examining it within the dynamic context of the "cultural and tourism industry." It proposes a new approach to the dynamic transmission of ICH known as "Space Empowerment." This approach leverages spatial planning, design, and renovation strategies to transform ICH resources from "static preservation" into "dynamic utilization," thereby constructing a three-dimensional Wine Fort cultural and tourism integration model comprising "ICH heritage, spatial carriers, and an industrial ecosystem." This Research clarifies the necessary pathways for integrating Wine Fort's ICH resources with its spatial environment and industrial ecosystem. Systematic spatial planning,

scenario creation, and functional integration can effectively unleash cultural resources, elevate the quality of visitor experiences, and expand industrial value-representing an effective means of fostering the synergistic development of ICH dynamic transmission and the cultural and tourism industries.

2. Analysis of the Current State of Ningxia's Cultural and Tourism Industry

Ningxia's cultural and tourism sector has established an integrated tourism development framework known as "One Axis, One Corridor, One Core Area, and Three Zones": the Yellow River Cultural and Tourism Development Axis, the Helan Mountain East Slope Wine Cultural and Tourism Corridor, the Yinchuan Cultural and Tourism Core Area, the Zhongwei Leisure and Resort Zone, the Liupan Mountain Ecological Red Culture Integration Zone, and the Eastern Historical and Cultural Exhibition Zone. Leveraging platforms such as the China-Arab States Expo and the International Wine Cultural and Tourism Expo, the region is integrating resources-including those related to the vast desert, the Yellow River, the Helan Mountains, and the red culture of the Liupan Mountains. However, in alignment with the requirements for high-quality development, Ningxia's cultural and tourism sector still faces several challenges: First, cultural exploration remains superficial, and there is insufficient resonance among visitors. The inadequate depth of exploration into the essence of local culture has led to product development remaining at a mere "scenic-viewing and photo-taking" level, lacking the capacity to creatively transform cultural elements into high-quality tourism experiences or to cultivate a profound cultural appeal. Second, resource integration is inadequate, and coordination among various sectors is weak. The rich resources-such as Yellow River culture, historical sites, and intangible cultural heritage-remain relatively fragmented, giving rise to issues such as redundant development and uneven regional growth; consequently, a well-structured, complementary, and interconnected integrated tourism ecosystem has yet to be established. Third, innovation-driven growth is insufficient, and the momentum for development is weak. Commercial development models, market operations, and the application of technology lag behind. The use of modern technologies-such as big data, AI, and VR-in

scenic area management, tourist services, and cultural dissemination is still limited, making it difficult to provide immersive and personalized interactive experiences. Fourth, brand building is inadequate, and the brand's influence is limited. Despite possessing unique cultural symbols, Ningxia has not yet effectively established a brand matrix with strong brand recognition. Some tourism product development models remain relatively traditional, characterized by indiscriminate trend-following and replication-particularly in sectors such as desert tourism and cultural experience offerings-where there is a lack of differentiated products rooted in deep, locally-driven innovation. This results in insufficient market appeal and makes it difficult to meet the demand of the new generation of travelers for personalized and novel experiences.

3. Ningxia Winery-Cultural Tourism Integration Strategy Under Space Empowerment

3.1 Spatial Translation Strategies for Intangible Cultural Heritage

3.1.1 Intangible cultural heritage symbol extraction and transformation

The system extracts the core symbols of Ningxia's intangible cultural heritage related to wine culture, converting the abstract culture into concrete spatial language. The local cultural tourism symbols not only maintain the original characteristics but also can be incorporated into the logical framework of fictional stories, thus making it possible for a new narrative system to emerge. The symbols and texts of multimedia can form a narrative "world", allowing viewers to have an imaginative relationship with the text.

(1) Technical Symbolic Transformation: Transforming production processes into an immersive spatial presentation by systematically converting the "Nine-Step Traditional Brewing Process" (material selection, washing, steaming, grinding, fermentation starter mixing, cellar placement, fermentation, distillation, and aging) into spatial nodes, creating a "Process Experience Corridor" that allows visitors to immersively experience the charm of traditional brewing techniques during their tour. An open-process experience corridor is set up outside the brewing workshop, with each production step corresponding to an independent spatial node equipped with appropriate traditional tools and interactive installations: the material selection

node displays high-quality local grapes from Ningxia, barberry wolfberry, lamb meat, and other raw materials, enabling visitors to observe the quality of the ingredients up close; the grinding node features traditional wooden mortars and stone mills, allowing visitors to participate in the grinding process firsthand; the fermentation node showcases traditional clay cellars, where the fermentation process can be observed through transparent glass, complemented by sensors and display screens that provide real-time data on temperature, humidity, and other parameters inside the cellars; the distillation node is equipped with traditional wooden distillation pans, allowing visitors to watch the distillation process and taste the freshly distilled wine. Additionally, the soil texture of the clay cellars and the decorative patterns of the ceramic jars are integrated into architectural elements-such as a relief artwork composed of ceramic jar fragments adorning the exterior wall of the winery, a floor paved with antique bricks mimicking the soil texture of the clay cellars, and an entrance gate designed in the shape of a ceramic jar-thereby embedding the symbols of intangible cultural heritage into every detail of the winery's space.

(2) Customary symbol transformation: Adapt the Western Xia's "Cellar Opening Ceremony" into a seasonal cultural event by hosting the "Cellar Opening Cultural Festival" during the grape harvest season, and designate specific spaces-such as ceremonial platforms and dance areas-for conducting the ritual; Transform religious beliefs into landscape landmarks-for example, by installing Helan Mountain rock art totem sculptures at the entrance of the Wine Castle to create a cultural memory point.

(3) Architectural symbolism transformation: The system identifies representative architectural elements from the Western Xia dynasty-such as "loam walls" and "pointed-topped roofs" -and integrates them seamlessly into the overall architectural design of the Wine Castle. For example, the Wine Culture Museum is constructed using traditional local loam-compacting techniques from Ningxia, giving its exterior walls a rugged and unadorned texture that not only echoes the historical character of the Western Xia Mausoleum and the ancient fortress but also demonstrates the preservation of regional construction traditions. Additionally, the roof can be designed with a distinctive Western Xia-style pointed top, its form inspired by the outline, features of Western Xia Buddhist

pagodas or royal mausoleums, thereby creating a well-proportioned skyline. Through this transformation and application of architectural vocabulary, the Wine Castle not only avoids mere blind imitation of European architectural styles in its exterior design but also strengthens its distinctive regional cultural identity, allowing visitors to immediately experience the rich Western Xia cultural ambiance and the unique character of the Loess Plateau upon entering the site.



Figure 1. Brewing Diagram



Figure 2. Tasting Room

3.1.2 Living restoration and innovation of intangible cultural heritage contexts

Historical scene restoration: By recreating wine-making workshops and taverns from the Western Xia dynasty using authentic historical settings, the cultural essence of this era is fully showcased. An antique-themed commercial space mimicking traditional Western Xia taverns has been established; through tangible exhibits and restored costumes, the allure of ancient drinking culture is brought to life, while AR technology transports visitors back to that bygone age. The modern reinterpretation of these experiential settings integrates intangible cultural heritage techniques into interactive hands-on activities. A "Traditional Brewing Experience Workshop" has been created, where participants follow the exact same operational procedures and pottery fermentation techniques used in historical wine

production-using physical displays and guided explanations to deepen visitors' understanding of the brewing process.

3.2 Spatial Function Integration Empowerment Strategy

3.2.1 Flexible functional zoning design

Establish a "Flexible Space Matrix" to enable the integrated utilization and dynamic adjustment of spatial functions.:

(1) Public landscapes and parking areas: In addition to basic supporting facilities, the entrance service area will feature an intangible cultural heritage (ICH) visual display zone and virtual reality interactive terminals; the parking lot area will be expanded, and the temporary exhibition space will be increased to accommodate the flexible needs of events such as the ICH market and welcome ceremonies.

(2) Core Experience Zone: Integrate commercial modules with the central cultural space to create a comprehensive experiential venue featuring a Traditional Brewing Techniques Exhibition Hall, a Wine Tasting Room, and a Thematic Exhibition Room; through modular design, enable rapid conversion between different functional zones, thereby enhancing the efficiency of spatial multi-purpose utilization.

(3) Cultural and Creative Zone: By renovating vegetation cover zones and pedestrian pathways to create a thematic garden that combines aesthetic appeal with recreational functionality, and by incorporating locally native plants alongside classical sculptural artworks, a harmonious atmosphere is fostered in which ecological landscapes and leisure spaces seamlessly integrate.

(4) Support Service Area: The design primarily employs regional cultural symbols and utilizes materials such as natural clay bricks and tiles for partitioning to create a rich historical ambiance; this approach not only ensures the seamless operation of logistical and service functions but also enhances the overall cultural character of the wine castle.

(5) Commercial accommodation area: The building utilizes various forms of spatial integration to serve commercial purposes, primarily selling products related to the intangible cultural heritage of wine culture; the homestay incorporates Western Xia architectural elements, creating a complete closed-loop experience of "experience – consumption – accommodation."

3.2.2 Interactive optimization of flow path design

(1) Circular flow path design: The visitor flow within an immersive exhibition space should unfold like a symphony-with clear transitions and dynamic progression-rather than following a straightforward, linear tour route. By replacing the traditional linear layout with a circular pathway that seamlessly connects the entrance information area, the core experience zone, the leisure landscape area, and the commercial support zone, and by incorporating engaging interactive installations, the overall visitor experience can be significantly enhanced.

(2) Differentiated Flow Path Planning: Develop tailored tour itineraries based on the needs of different groups – such as fun exploration routes designed for family-friendly activities, educational experience tours aimed at young adults interested in study-based travel, or professional tasting events specifically tailored for business professionals – thereby addressing the diverse personalized needs of users across various segments.

3.3 Technology-Driven Immersive Experience Strategy

3.3.1 Digital Intangible Cultural Heritage Experience Platform Development

(1) Immersive technology applications: The "Western Xia Wine Castle Adventure" experiential project utilizes VR technology to transport visitors back to a wine-making workshop from the Western Xia period; meanwhile, holographic projection technology is employed in the central cultural space to showcase the Western Xia Wine Unloading Ceremony, enabling the digital restoration of this cultural scene.

(2) Intangible Cultural Heritage Digital Resource Repository Development: By collecting visual materials documenting traditional brewing techniques and the ceremonial practices surrounding Xixia wine, alongside oral histories from its inheritors, a digital resource database for Ningxia's wine culture intangible cultural heritage has been established. Visitors can access this database via inquiry terminals within the Wine Castles or through online platforms, facilitating the digital dissemination of this intangible cultural heritage.

3.3.2 Smart Cultural and Tourism Service Upgrades

(1) Smart Tour Guide System: Develop a dedicated smart tour mini-program offering

services such as AR guided tours, explanations of intangible cultural heritage, and online booking; install smart tour screens within the wine castle venue to provide visitors with real-time cultural information about the area.

(2) Big Data Precision Services: This involves using smart devices to collect tourists' behavioral data and analyzing factors such as their stay duration and spending habits, thereby optimizing spatial layout and business format planning. Experience-based activities related to Barbary Wolfberry wine can be added according to tourists' preferences.

3.4 Industrial Ecosystem Collaborative Development Strategy

3.4.1 Integrate with Ningxia's "Six New, Six Specialized, and Six Optimized" industrial initiatives

(1) Integrate with the "Six Specialized Industries": Collaborate with the Barbary Wolfberry industry to develop Barbary Wolfberry wine and Barbary Wolfberry-themed cultural products; Partner with the Tan Sheep industry to offer a complementary meal package featuring Tan Sheep cuisine and lamb wine in the dining area; Collaborate with the Helan Inkstone industry to sell Helan Inkstone wine accessories at the cultural and creative center, achieving the integration of specialized agriculture and wine culture.

(2) Integrating with the "Six New" industries: Leveraging digital industrial technologies to develop a Wine Fort Digital Twin System for visualizing production processes; utilizing the new energy sector by installing solar-powered lighting and photovoltaic charging facilities within Wine Fort to create a sustainable cultural and tourism experience.

(3) Integrate with the "Six Excellence" industries: Partner with the cultural and tourism sector by incorporating the wine estate into Ningxia's "Twenty-One Scenic Spots" premium tourism route; collaborate with the commerce and services sector by launching an online intangible cultural heritage-themed creative goods marketplace to facilitate seamless integration of online and offline consumption.

3.4.2 Full industry chain ecosystem development To establish a full-chain business model of "purchase - brewing - experience - sales - cultural creation", Chen Fang (2024) in "Research on the Integration Model of Wine Estate Agricultural Tourism and Cultural Industry and Landscape

Planning and Design Strategies" classified the industrial integration of wine estates into "three modes: penetration type, extension type, and reorganization type". Among them, the extension type mode emphasizes "starting from agriculture, connecting the agricultural production, processing, and sales chains, and developing multiple new functions of agriculture":

(1) Front-end business model: The front-end business model is centered on the cultural essence of wine, using immersive experiences to convey the brand's core values and leveraging a localized supply chain system to ensure the quality and consistency of wines produced in their place of origin. For the first time, this model introduces a comprehensive wine adoption experience program that utilizes digital technologies to enable tourists – without having to visit the production site in person – to participate in the entire lifecycle of a specific batch of wine, from selection and cultivation to bottling. This approach establishes a complete traceability chain, facilitates the connection between the place of origin and the end market, and thereby enhances consumer loyalty and brand trust.

(2) Mid-range business segments: By establishing diverse functional spaces—such as intangible cultural heritage workshops and wine etiquette experience zones—visitors can systematically engage in traditional craft experiences and a variety of cultural activities, allowing them to personally discover the unique charm of intangible cultural heritage and the profound depth of wine etiquette culture. This initiative not only effectively enhances the cultural value of the winery but also facilitates the transformation of mere wine consumption into a multifaceted experience encompassing cultural engagement and the preservation of traditional craftsmanship, ultimately achieving the dual objectives of increasing cultural resource value and strengthening the brand image.

(3) Backend Business Model: Within the Cultural and Creative Products Pavilion, the focus will be on developing intangible cultural heritage-themed creative products centered around wine culture; for example, wine bottles designed in the style of ancient ceramic jars – which not only replicate the simple, rustic appearance of traditional wine-making vessels but also offer both practical and collectible value. Additionally, bookmarks featuring Western Xia or Helan Mountain rock art totem elements will be

launched, allowing visitors to experience the unique symbols of local culture while reading. Furthermore, an online marketplace should be established to sell not only the winery's own wines and the aforementioned range of cultural and creative products but also to integrate the rights associated with vineyard adoption into the online sales system, enabling consumers to remotely adopt a single grapevine or a vineyard plot via the internet and enjoy the sense of participation as well as exclusive benefits throughout the entire process – from planting to harvesting. By seamlessly integrating offline cultural and creative displays with online marketplace sales, a comprehensive, closed-loop consumer experience – spanning wine production, cultural and creative derivative products, adoption experiences, and merchandise transactions – can be created, thereby significantly enhancing the added value at every stage.

Table 1. Correspondence Between Design Strategies and Problems

Problem Level	Design Strategy	Concrete Measure	Strategic Objective
Climate Adaptation	Climate-Adaptive Design	Energy-efficient buildings, shading and wind protection, and drought-resistant plant selection and arrangement	Mitigate climate-related constraints and enhance visitor comfort
cultural inheritance	Living Translation of Intangible Cultural Heritage	Traditional craft workshops, Western Xia wine ceremony, and rock art integration	Leverage intangible cultural heritage resources to enhance cultural distinctiveness.
space structure	Composite Spatial Reconstruction	Flow path optimization, functional zoning, and flexible spaces	Integrate spatial order and enhance utilization efficiency
Industrial Operations	End-to-end business ecosystem empowerment	Purchase – Experience – Sales Closed-Loop; Peak and Off-Peak Seasonal Campaigns	Balance passenger flow to achieve sustainable operations

4. Conclusion

This Research proposes a four-dimensional interconnected empowerment framework comprising "intangible cultural heritage translation – spatial integration – technological

innovation – industrial transformation," offering a systematically designed solution with practical reference value. For the spatial transformation of intangible cultural heritage, symbolic processing is employed to deconstruct the aesthetic elements inherent in traditional handicrafts, folk festivals, and ancient architecture; these elements are then presented through visual spatial narrative symbols. By utilizing scenario reconstruction techniques to restore historical contexts, combined with multi-sensory interactive installations and immersive experiential approaches, this framework transcends the limitations of static display methods for intangible cultural heritage. Addressing the current challenges of monotonous spatial layouts and severe homogenization, this research introduces the concept of dynamic zoning in design philosophy-encouraging the flexible conversion and utilization of multifunctional zones-and optimizing route planning to enhance the overall fluidity and engagement of the recreational experience. Leveraging emerging digital technologies-such as virtual reality (VR), augmented reality (AR), and holographic projection-to create immersive digital intangible cultural heritage exhibition projects, and harnessing intelligent guided tour devices and big data analytics systems as powerful technological tools, this approach is realized. Regarding the collaborative development of the industrial chain, the "Six New, Six Special, and Six Optimized" industrial resources of Ningxia can be integrated to establish a comprehensive industrial chain ecosystem encompassing raw material supply, the preservation of wine-making techniques, scenic area operation and management, product marketing, and the development of cultural and creative products-thereby significantly enhancing the overall competitiveness and sustainable development capacity of the local economy. These elements work in synergy and complement each other, not only safeguarding cultural heritage but also maximizing the realization of spatial value, while effectively aligning with market-driven approaches; thus, they provide a theoretical foundation and technical pathway support for the integrated development of Wine Castles as a cultural tourism destination in Ningxia.

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