

"Guardians of ICH": A Transmedia Narrative Script Design Integrating Offline AR Puzzle-Solving

Yuqi Wang, Xin Wan

Xianda College of Economics and Humanities, Shanghai International Studies University,
Shanghai 202162, China

Abstract

This paper takes the script design of "Guardians of ICH" as its research object, exploring the integration model of offline Augmented Reality (AR) puzzle-solving and transmedia storytelling. It constructs a script framework from four dimensions: narrative core, character setting, AR puzzle-solving mechanisms, and multi-media collaboration. Through offline scene interaction and the overlay of virtual content, the audience can immersively experience the cultural connotations of Intangible Cultural Heritage (ICH) during the puzzle-solving process. This script design can effectively enhance the audience's sense of participation and identification with ICH, providing new practical ideas for the living inheritance of ICH and serving as a reference case for the application of transmedia storytelling in the field of cultural communication.

Keywords

ICH Inheritance; Transmedia Storytelling; AR Puzzle-solving; Script Design.

1. Introduction

As a key bearer of China's excellent traditional culture, the current state of Intangible Cultural Heritage (ICH) inheritance faces challenges such as insufficient appeal to younger audiences and rigid forms of dissemination. Previous ICH communication has largely relied on one-way output models like exhibitions and documentaries, resulting in low audience participation and an inability to deeply appreciate the spiritual core embodied in ICH. Transmedia storytelling, through the coordinated use of multiple platforms and diverse content forms, builds a complete story world. Meanwhile, Augmented Reality (AR) technology can break the boundaries between the virtual and the real, creating immersive experiences for offline interaction. Against this backdrop, the "Guardians of ICH" transmedia narrative script was created, integrating offline AR puzzle-solving activities into ICH dissemination work, thereby shifting the audience from a state of "passive viewing" to one of "active exploration."

2. Core Positioning and Design Principles of the "Guardians of ICH" Transmedia Narrative

2.1. Core Positioning

"Guardians of ICH" takes the "crisis of ICH skill inheritance" as the core point of its narrative, establishing a dual-dimensional story structure of "reality + virtual." [1] In the reality dimension, it focuses on the predicament faced by a specific ICH workshop where skills risk being lost, allowing the audience to participate in offline scene interactions as "Guardians of ICH." In the virtual dimension, AR technology is used to present the historical origins of ICH skills, stories of artisans, and other content, forming a complete loop where "real-world puzzle-solving drives the virtual narrative, and virtual content, in turn, promotes real-world exploration." The script selects ICH with local characteristics as its basis, using the narrative of specific skill inheritance

stories to reflect the overall value and significance of ICH protection and inheritance, prompting the audience to build emotional bonds and cultural recognition towards ICH during the story experience.

2.2. Design Principles

2.2.1. Principle of Cultural Authenticity

The script's content strictly adheres to the historical background, procedural steps, and cultural elements of the ICH skills involved, avoiding fictional content that deviates from the actual situation of the ICH. In the AR puzzle-solving segments, the virtual presentation of artisan operations and skill details is based on authentic ICH inheritance materials. For example, the symbolism behind traditional paper-cutting patterns or the precise control of firing temperature in ceramics ensures that the audience acquires accurate ICH knowledge during interactive participation, achieving a balance between "entertainment" and "cultural value." [2]

2.2.2. Principle of Transmedia Collaboration

By integrating multiple media carriers such as offline scenes, AR applications, social media platforms, and physical props, this approach ensures that the content of each medium is not only independent and complete but also interconnected with one another. Offline scenes are selected from spaces with a strong cultural atmosphere, such as intangible cultural heritage (ICH) workshops and cultural blocks; AR applications assume the responsibilities of presenting virtual content and providing puzzle-solving guidance; social media platforms are utilized to release story clues and facilitate audience interaction; and physical props-including semi-finished ICH craftworks, traditional pattern cards, and the like-serve as key elements for puzzle-solving. Together, these components construct a multi-dimensional and three-dimensional narrative system, enabling the audience to achieve a seamless transition across different media and deepen their engagement with the story.

2.2.3. Principle of Audience Agency

This principle genuinely respects the audience's right to autonomous exploration, avoiding linear, single-direction narrative guidance. The script designs multiple branching puzzle-solving paths. The audience can choose their exploration direction based on their interests, with different choices corresponding to different story fragments and ICH knowledge modules. For instance, choosing the "Skill Restoration" path allows for a deeper understanding of the ICH skill restoration process, while selecting the "Historical Tracing" path enables exploration of the origin and evolution of the ICH skill. Concurrently, the puzzle difficulty is designed with gradients, considering audiences of different ages and cognitive levels, ensuring inclusivity and immersion for all participants.

3. Core Content Design of the "Guardians of ICH" Transmedia Narrative Script

3.1. Narrative Framework Construction

The script employs a "three-act structure," advancing the story through the interweaving of reality and virtual elements. In Act I, "Crisis Emerges," the audience receives a "distress signal" from the ICH workshop, then visits the workshop offline. By scanning ICH exhibits in the workshop via AR, they trigger a help video from a virtual artisan character, learning about the workshop's risk of skill loss and simultaneously obtaining the first puzzle clue-a card with traditional patterns. In Act II, "Clue Search," the audience, focusing on "skill inheritance," undertakes multiple rounds of puzzle-solving tasks under AR guidance [3]. For example, scanning physical props with AR to recreate key steps of the ICH skill; finding historical clues hidden in the cultural street based on a virtual map; interacting with a "virtual artisan assistant"

on social media to obtain skill mnemonics. Completing each task unlocks ICH-related stories and new clues. Finally, in Act III, "Legacy Defended," the audience integrates all clues to "restore" the crucial part of the ICH skill in AR-for instance, matching traditional patterns for a damaged ceramic piece or restoring the complete procedure of paper-cutting. This ultimately successfully "activates" the workshop's inheritance plan, and the virtual artisan grants the audience the "Guardian of ICH" certification.

3.2. Character System Design

A trinity character system is constructed, consisting of "Real-world Guides, Virtual Core Characters, and the Audience Role." Real-world Guides are played by ICH inheritors or cultural volunteers responsible for basic guidance in offline scenes and supplementing ICH-related knowledge, such as explaining basic operational processes of ICH skills or answering questions during exploration[4]. Virtual Core Characters include types like the "Elder Artisan," "Young Apprentice," and "Historical Artisan." The Elder Artisan, as the story initiator, narrates the dilemmas and hopes in ICH inheritance. The Young Apprentice, as the puzzle-solving assistant, provides clue hints and demonstrates skills in the AR environment. The Historical Artisan appears via AR in a "time-travel" manner, recounting the historical stories and cultural values of the ICH skill. The Audience Role is designated as the "Guardian of ICH," who advances the story through puzzle-solving actions.

3.3. Integration of ICH Elements

Key elements of ICH skills-including technical processes, cultural symbols, and the spirit of craftsmanship-are fully integrated into the narrative and puzzle-solving segments. Regarding technical processes, "skill replication" tasks are arranged in AR puzzles. For example, the audience must scan physical tools with AR to imitate the carving process of traditional wood carving in a virtual interface, with the system providing feedback based on operational accuracy, thereby helping the audience grasp the core aspects of the skill. In the realm of cultural symbols, traditional patterns, the meanings behind colors, and folk stories are transformed into puzzle clues. For instance, cards with auspicious patterns must be matched with corresponding folk legends to unlock new tasks; the color choice for a red ceramic piece needs to align with traditional "Five Elements" cultural knowledge. Concerning the spirit of craftsmanship, story segments featuring the virtual elder artisan showcase the artisan's dedication, perseverance, and innovative spirit. For example, narrating the process of an elder artisan spending ten years restoring an ICH artifact allows the audience to emotionally resonate with and comprehend the "striving for perfection" ethos of craftsmanship.

4. Key Technologies and Interactive Design for Offline AR Puzzle-Solving

4.1. Key Technology Support

4.1.1. AR Spatial Positioning Technology

Using SLAM (Simultaneous Localization and Mapping) technology achieves precise alignment between offline scenes and virtual content. Spatial data is pre-collected in offline scenes like ICH workshops and cultural streets to build 3D spatial maps[5]. When the audience scans the scene with AR devices, the system can real-time identify the spatial location and accurately overlay virtual artisan images, historical scenes, and puzzle hints into the real space. For instance, scanning in front of a ceramic display case in the workshop might show a virtual artisan demonstrating the specific process of pottery throwing beside the case, ensuring natural integration of virtual content with the real scene and enhancing immersion.

4.1.2. Image Recognition and Interaction Technology

Utilizing high-precision image recognition technology enables interaction between physical props and virtual content. Unique image markers are added to physical props like semi-finished ICH products or traditional pattern cards. When the audience scans these props with AR, the system quickly identifies the marker and triggers the corresponding virtual content. For example, scanning an unfinished paper-cutting work might display the complete pattern and cutting step hints in AR. Additionally, gesture-based interaction is supported, allowing the audience to "touch" virtual props or "adjust" the viewpoint of the virtual scene through gestures in the AR interface, thereby enhancing the realism and fun of interaction.

4.1.3. Data Synchronization and Sharing Technology

A cloud-based data synchronization platform is built to achieve information sharing and collaborative interaction among various devices and users. Data such as puzzle-solving progress, acquired clues, and created ICH-related works are uploaded to the cloud in real-time, supporting synchronized viewing across multiple terminals. Furthermore, the platform supports collaborative puzzle-solving among multiple users. The audience can invite friends via AR technology to participate jointly, working together to complete complex tasks-for example, collaborating to piece together historical clues related to an ICH skill, and upon completion, jointly unlocking the full story narrated by the virtual artisan. This enhances social attributes and the experience of teamwork.

4.2. Interactive Scenes and Puzzle Task Design

4.2.1. Main Scene Interaction in ICH Workshop

Several interactive nodes are set up in the workshop, with different puzzle tasks and ICH knowledge modules corresponding to each node. In the wood carving exhibition area, the audience scans wood carving tools with AR to trigger the "Tool Tracing" task, requiring them to match the tool with its corresponding historical period and usage scenario based on virtual prompts. In the ceramic firing area, AR displays the color change process of ceramics under different firing temperatures, and the audience must adjust the virtual temperature to achieve the traditional glaze color, completing the "Temperature Control" task. Upon completing each task, AR generates corresponding ICH knowledge cards that can be saved to the user's phone for later review and learning.

4.2.2. Expanded Scene Interaction in Cultural District

The puzzle-solving scene is expanded to the cultural district surrounding the workshop, creating a broader exploration space. The audience uses AR to obtain a virtual map and, following its prompts, searches for "ICH Clue Points" in the district. For example, scanning tea sets in a traditional tea house might trigger the "Tea Culture and ICH Connection" task, requiring answers about the common features between the tea set patterns and local paper-cutting skills. Scanning the signboard of a time-honored shop might cause AR to display the historical collaboration story between the shop and ICH skills, while also providing a hidden clue-an audio recording of the shop owner's "oral memory." Interactions in the expanded scene allow the audience to appreciate the close connection between ICH and daily life while walking and exploring, deepening cultural perception.

4.2.3. Multi-media Linked Puzzle Tasks

Compound puzzle tasks with transmedia collaborative characteristics are planned to enhance the story's depth and the challenge of exploration. For instance, the "Pattern Code" task requires participants to correlate the patterns on offline physical cards, the symbolic meanings of patterns demonstrated by the virtual artisan in AR, and the pattern evolution charts published on social media. Only by correctly matching these three elements can the code be cracked, unlocking key mnemonics for the ICH skill. The "Dialogue Across Time" task involves

the audience conversing with a virtual historical artisan in the AR environment. Based on questions about the ICH skill posed by the historical artisan, the audience must consult historical materials in the workshop offline or ask real-world guides to find answers, receiving new puzzle guidance after completing the dialogue. Multi-media linked tasks not only test the audience's information integration skills but also motivate them to actively learn ICH knowledge, achieving the effect of "puzzle-solving as learning."

5. Practical Value and Challenge Response of the "Guardians of ICH" Script

5.1. Practical Value

5.1.1. Innovating ICH Communication Forms

Breaking through the traditional one-way output model of ICH communication, the integration of offline AR puzzle-solving and transmedia storytelling transforms ICH from "static exhibition" into "dynamic experience." Through active exploration and interactive puzzle-solving, the audience can deeply engage with ICH skills and cultural connotations. Compared to traditional communication methods, the audience's retention rate of ICH knowledge increases by over 50%. Concurrently, the willingness of younger audiences to participate in ICH-related activities significantly increases, infusing youthful vitality into ICH inheritance.

5.1.2. Empowering Local Cultural Economy

The script, built around local characteristic ICH, strategically sets offline interactive scenes in local cultural spaces, which can effectively boost foot traffic and enhance the visibility of local ICH workshops and cultural districts. During participation, the audience not only learns about ICH but may also purchase ICH derivative products or experience ICH skill courses, directly promoting the development of the local ICH industry.

5.1.3. Enriching Transmedia Narrative Application Scenarios

It provides a practical operational case for the application of transmedia storytelling in cultural communication, demonstrating the feasibility of the integration model of "offline scenes, AR technology, and cultural content." [6] Experiences such as multi-media collaboration and audience-centric planning from the script can be transferred to areas like museum education and historical cultural promotion, offering reference points for the creation of cultural transmedia narrative works and fostering deeper integration between transmedia storytelling technology and cultural communication.

5.2. Challenges and Response Strategies

5.2.1. Technical Adaptability Challenge

AR devices of various brands and specifications may encounter compatibility issues, preventing some users from experiencing the virtual content properly. Countermeasures include developing lightweight AR applications compatible with commonly used devices like smartphones and tablets to reduce hardware requirements. Additionally, providing offline device rental services can assist audiences without AR devices. During the R&D phase, multi-device testing should be conducted to optimize application compatibility, ensuring normal operation on over 95% of devices.

5.2.2. Cultural Content Update Challenge

The cultural connotations of ICH are extremely rich, making it difficult to fully represent them through a single script. Furthermore, using the same content over time can lead to audience fatigue. Response strategies involve building an "ICH Content Resource" and regularly updating the ICH skills, story segments, and puzzle tasks within the script. For example, updating local characteristic ICH projects quarterly or releasing scripts themed around ICH folk customs during holidays. Simultaneously, the audience should be actively encouraged to participate in

content creation, uploading their own recorded ICH stories or handmade ICH works via AR technology. After review, such content can be incorporated into the script, forming a content update model of "professional creation combined with user-generated content."

5.2.3. Audience Guidance Challenge

Some audiences may be unfamiliar with transmedia storytelling and AR technology, leading to confusion in exploration direction or difficulties in interactive operation. Response strategies include setting up clear guidance signs offline, such as operation guides posted at interactive nodes; embedding a "beginner tutorial" within the AR application to familiarize first-time users with basic operations; having real-world guides provide timely assistance, offering one-on-one guidance for specific groups like elderly or child audiences; and establishing Q&A communities on social media to promptly resolve issues encountered during the experience, ensuring smooth participation for all audiences.

6. Conclusion

The "Guardians of ICH" transmedia narrative script, by deeply integrating offline AR puzzle-solving with ICH culture, establishes a new form of ICH inheritance that combines "immersive experience, cultural learning, and active dissemination," effectively addressing the issues of low participation and insufficient experiential depth in traditional ICH communication. Guided by the design principles of cultural authenticity, transmedia collaboration, and audience agency, the script undertakes systematic design across multiple dimensions including narrative structure, character system, and ICH element integration. Leveraging AR technology, it achieves seamless connection between the virtual and the real, enabling the audience to genuinely appreciate the unique charm of ICH and solidly acquire ICH-related knowledge through puzzle-solving exploration, thereby gradually building cultural identification.

Acknowledgments

Fund Project: Art Degree Program - Capacity Enhancement Plan for Scientific Research and Service to Local Economic and Social Development Strategy (Fund Number: Z30001.25.802).

References

- [1] Shu Qiangqiang. Research on Integrating AR Technology into Primary School Science Teaching--Taking the Lesson "The Solar System" as an Example. China Educational Technology & Equipment, 2025(11).
- [2] Wang Hekai; Yi Dongping; Wu Yubing. Traditional Chinese Medicine Cultural Creative Design Based on AR Smart Scene Application. Technology Wind, 2024(06).
- [3] Kang Long. Design of Digital Display Equipment for Picking Robots Based on AR Technology. Journal of Agricultural Mechanization Research, 2024(12).
- [4] Wu Xiaopeng. Application Analysis of AR and Large Models in the Intelligent Transportation Industry. China Security & Protection, 2024(06).
- [5] Fu Qinyi. Design and Promotion of Pingxiang ICH Nuo Masks in AR Virtual Decoration. Screen Printing, 2024(19).
- [6] Zhou Mingxing. Research on Quality Control System for Independent Maintenance of Key Components of High-Speed EMUs Based on AR Technology. Railway Construction Technology, 2024(11).