Integrated Development of Broadcast Television Technology and Cultural Tourism Projects: Post-print

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Abstract

【Objective】 Technological innovation leads deep integration, diversification and personalization of integrated experiences, cross-regional and cross-cultural integrated dissemination of broadcast television technology, with successful integration cases of broadcast television technology and cultural tourism projects serving as exemplary models of innovative integration.

【Method】 Big data empowering cultural tourism projects is a new engine for enhancing operational efficiency; the application of big data in tourist safety management for cultural tourism projects is an intelligent shield safeguarding tourist safety.

【Result】 Broadcast television technology empowering Sanya's cultural tourism represents innovative integration and diversified development; the integrated development path of Xiamen's broadcast television technology and cultural tourism projects.

【Conclusion】 The integrated development of broadcast television technology and cultural tourism projects continuously enhances the quality and appeal of cultural tourism projects, brings unprecedented experiences to tourists, promotes the vigorous development of the cultural tourism industry, and further facilitates cultural inheritance and exchange.

Full Text

Integration Development of Broadcast Television Technology and Cultural Tourism Projects

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Abstract

[**Objective**] This study examines how technological innovation drives deep integration between broadcast television technology and cultural tourism projects, focusing on diversified and personalized fusion experiences, cross-regional and cross-cultural communication, and successful integration cases as models for innovative fusion. [**Method**] Big data serves as a new engine for improving operational efficiency in cultural tourism projects, while its application in tourist safety management functions as an intelligent shield for protecting visitors. [**Result**] The analysis reveals that broadcast technology empowerment of Sanya's cultural tourism represents innovative fusion and diversified development, and explores the integration path of Xiamen's broadcast television technology with cultural tourism projects. [**Conclusion**] The integrated development of broadcast television technology and cultural tourism continuously enhances project quality and appeal, delivering unprecedented experiences for tourists while promoting the vigorous development of the cultural tourism industry and facilitating cultural inheritance and exchange.

Keywords: broadcast television technology; panoramic video technology; artificial intelligence; innovative fusion; intelligent shield
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1.1 Diversified Experiences

Technological innovation drives deep integration, with ultra-high definition (4K, 8K) and panoramic video technology developing alongside broadcast television advances and finding broader application in cultural tourism projects. Ultra-high definition video delivers more delicate and realistic images, allowing tourists to feel as if they are truly present when watching cultural performances or natural landscape displays. Panoramic video technology, meanwhile, provides visitors with 360-degree comprehensive perspectives, creating novel immersive experiences whether touring historical buildings or enjoying natural scenery. According to relevant data, cultural tourism projects employing ultra-high definition and panoramic video technology score over 20% higher in tourist satisfaction surveys compared to traditional projects.

Artificial intelligence (AI) and big data technology will play increasingly important roles in the fusion of broadcast television technology and cultural tourism projects. In these projects, AI tour guide robots can provide personalized routes and commentary based on tourists' interests and visit histories. Big data tech-

nology can analyze tourist behavior data, such as dwell time and consumption preferences, helping operators optimize project content and services. Future integration will also bring more diversified sensory experiences beyond visual and auditory enjoyment. For instance, in some cultural theme parks, special effects technology from broadcast television combined with scent release devices and tactile simulation equipment can create multi-sensory fusion experiences.

1.2 Personalized Customization

As tourists increasingly demand personalized experiences, integration development will move toward customized services. Leveraging interactive technology and big data analysis from broadcast television, cultural tourism projects can tailor unique experiences for each visitor. Before their visit, tourists can select their preferred cultural elements and experience types through online platforms, and the project can generate personalized tour plans including customized video explanations and exclusive interactive activities. This personalized approach will meet diverse needs and enhance tourist loyalty.

2. Cross-Regional and Cross-Cultural Fusion Communication

2.1 Cross-Regional Fusion Broadcast television technology will break geographical barriers and enable cross-regional integration of cultural tourism projects. Different regional projects can conduct joint promotion and interaction through online platforms. For example, southern water towns and northern ancient cities can collaborate through live streaming and online interactive activities, showcasing their respective cultural characteristics, sharing tourism resources, and even jointly creating cross-regional tourism routes. This cross-regional fusion expands market reach and attracts tourists from different regions. Television technology, with its excellent visual presentation capabilities, injects new vitality into cultural tourism projects. High-definition photography and aerial technology can display the magnificent scenery of tourist attractions in the most stunning ways.

2.2 Cross-Cultural Communication The integrated development of broadcast television technology and cultural tourism projects demonstrates trends of technological innovation leading deep integration, diversified and personalized experiences, and cross-regional and cross-cultural communication. These trends continuously enhance project quality and appeal, delivering unprecedented experiences while promoting industry development and cultural exchange. In the future, we can expect more creative and technology-driven cultural tourism projects to emerge as new highlights of culture-tourism integration.

3. Successful Cases of Broadcast Television Technology and Cultural Tourism Integration

3.1 The Digital Palace Museum Content Creation and Display: The Palace Museum has utilized high-definition video shooting and production tech-

nology from broadcast television to create exquisite documentaries such as *Palace Museum 100*. This series comprises 100 short episodes of six minutes each, providing in-depth interpretation from perspectives of architecture, cultural relics, and historical culture. Employing high-definition filming, the documentary clearly presents every brick and tile of the palace, every blade of grass, and the details of precious artifacts.

Promotion and Publicity: The Palace Museum has fully leveraged broadcast television technology for promotion. Beyond traditional television programs, it actively utilizes online video platforms. For instance, it has released numerous short videos on Douyin showcasing the palace's seasonal beauty and artifact restoration processes. Some popular videos have received millions of likes, significantly enhancing the museum's visibility and tourist appeal.

3.2 Disneyland's Comprehensive Immersive Experience Content Creation and Display: Based on its rich storytelling content, Disneyland has created numerous immersive experience projects using broadcast television technology. For example, in attractions like "Pirates of the Caribbean—Battle for the Sunken Treasure," advanced animation and special effects technologies originally widely used in broadcast television animation production are employed. Tourists ride boats through simulated ocean scenes, with surrounding environments displaying lifelike pirate ships, underwater treasures, and sea monsters through high-definition projection technology.

Interactive Experience: Disneyland's mobile app also represents the fusion of broadcast television technology with cultural tourism. Visitors can obtain practical information such as attraction wait times and show schedules through the app. Additionally, the app features interactive functions—for instance, during certain performances or activities, tourists can participate in interactive games and voting, much like participating in an interactive television program. This interactive experience enhances visitor engagement and enjoyment while improving the overall park experience.

3.3 Dunhuang Mogao Grottoes: Digital Inheritance and Innovation Content Creation and Display: The Dunhuang Mogao Grottoes face the challenge of balancing preservation with tourism development, which the Digital Dunhuang project addresses effectively using broadcast television technology. Through high-resolution image acquisition technology, the murals and caves have been digitally captured, and 3D modeling technology has been used to realistically reconstruct them on digital platforms. At the visitor center, tourists can watch digital films about the grottoes in a dome theater. These films employ high-definition visuals and surround sound technology to present the historical, cultural, and artistic value of the Mogao Grottoes in a stunning manner. This approach both protects the original caves and murals while allowing visitors to deeply appreciate their charm.

Promotion and Publicity: The Digital Dunhuang project also utilizes broad-

cast television technology for promotion, producing exquisite promotional videos broadcast on television and online platforms both domestically and internationally. These videos showcase the exquisite murals, mysterious caves, and achievements of the Digital Dunhuang project, attracting numerous tourists and cultural enthusiasts while enhancing the international visibility and tourist appeal of the Mogao Grottoes.

4. Big Data Empowering Cultural Tourism Projects as a New Engine for Operational Efficiency

4.1 Big Data in Precision Marketing: Targeting Key Customer Groups Customer Profiling: Big data enables cultural tourism projects to construct detailed customer profiles. By collecting various online data—including social media interactions, online travel platform booking records, and search engine browsing histories—operators can gain deep insights into tourists' age, gender, region, interests, and consumption habits. For example, a coastal cultural tourism project discovered through big data analysis that its main visitor group consists of people aged 25-40 from surrounding cities who are interested in water sports and seafood, tend to travel during holidays, and have medium-to-high consumption capacity. With such precise profiling, projects can develop targeted marketing strategies for this specific group.

Precision Marketing Channel Selection: Statistics show that cultural tourism projects using big data to precisely select marketing channels can improve their marketing ROI by over 30%. For instance, an ancient town tourism project discovered that its potential tourists showed high interest in ancient town culture-related topics on Weibo, prompting it to increase promotion efforts on the platform by posting exquisite photos and interesting cultural activity videos, thereby attracting significant attention from target tourists.

4.2 Personalized Service Customization Service Demand Prediction: Big data can predict tourist service demands. By analyzing historical data such as tourist routes within scenic areas, dwell time at various attractions, and dining and accommodation consumption patterns, operators can forecast demand for different services at various times. For example, a large theme park discovered through big data analysis that demand for dining services peaks between 3-5 PM during holidays, with most tourists preferring fast food. Based on this insight, the park can arrange additional dining staff in advance and optimize fast food supply processes to ensure quick service and reduce waiting times, thereby enhancing tourist satisfaction.

Personalized Service Customization: Leveraging big data for personalized service customization also improves operational efficiency. Based on tourists' historical consumption records and preferences, cultural tourism projects can provide personalized service recommendations. For instance, for guests who frequently stay at a hotel and enjoy fitness, the hotel can offer free fitness class vouchers or upgrade them to rooms near the gym during their next visit.

Such personalized services not only increase satisfaction but also boost loyalty—statistics show that tourists receiving personalized services are 40% more likely to choose the same project again.

4.3 Big Data in Resource Management and Cost Control **Rational Resource Allocation:** Big data helps achieve rational resource allocation in cultural tourism projects. Taking scenic area transportation as an example, analyzing tourist flow distribution and travel time data enables reasonable arrangement of vehicle numbers and operating routes.

Precise Cost Control: Big data also enables precise cost control. By analyzing relationships between various cost data and tourist flow and revenue, operators can identify key cost control points. For example, a cultural tourism project discovered that during off-peak seasons, certain high-cost performance programs could reduce show frequency without significantly impacting tourist satisfaction. This approach allows projects to precisely control costs while maintaining service quality and improving economic benefits.

5. Big Data in Tourist Safety Management as an Intelligent Shield

5.1 Weather and Geological Disaster Early Warning **Meteorological and Geological Disaster Warning:** Big data's first application in tourist safety management is weather and geological disaster early warning. Cultural tourism projects located in different geographical environments may be affected by various meteorological and geological factors. By integrating multi-source data from meteorological and geological monitoring departments, big data can provide early warnings for impending disasters such as heavy rain, typhoons, earthquakes, and landslides.

Crowd Density Monitoring and Warning: In popular cultural tourism projects, excessive tourist flow may lead to safety accidents like stampedes. Big data technology can collect tourist location information through surveillance equipment, ticket sales systems, and Wi-Fi hotspots to monitor crowd density in real-time across different areas. When crowd density in any area reaches a set safety threshold, the system issues timely warnings. For instance, in some large theme parks, big data systems can precisely monitor crowd conditions around every attraction and ride queue area. Once crowds become too dense, management can implement flow control measures such as guiding tourists to other areas or temporarily closing queue entrances to ensure visitor safety.

5.2 Tourist Health Monitoring **Infectious Disease Prevention and Control:** Big data can assist in infectious disease prevention and control by analyzing tourists' activity trajectories within scenic areas and their contact with other visitors. For example, if an infectious disease outbreak occurs in a region, cultural tourism projects can use big data to track recent visitors from that area, identify potentially exposed tourists, and send health reminders.

Data on public facility usage within the scenic area (such as restaurants and accommodations) can also be incorporated for more precise disease control.

Special Tourist Health Care: Big data also serves tourists with special health needs. For instance, through reservation information or health declaration data, scenic areas can learn whether visitors have chronic diseases (such as heart disease or diabetes). During their visit, the scenic area can provide appropriate medical services based on their activity trajectories and dwell times. If a diabetic tourist spends an extended time in the scenic area, the big data system can alert medical point staff to prepare emergency supplies like glucose in advance, ensuring timely treatment when needed.

6. Broadcast Technology Empowering Sanya Cultural Tourism: Innovative Fusion and Diversified Development

6.1 Broadcast Technology Assisting Sanya Cultural Tourism Promotion High-definition filming and exquisite post-production from broadcast technology have created highly attractive promotional videos for Sanya's cultural tourism. Sanya boasts charming tropical coastal scenery, including the crystal-clear waters and fine sandy beaches of Yalong Bay and the colorful underwater world of Wuzhizhou Island. These beautiful scenes are perfectly captured through high-definition cameras, and post-production staff incorporate cultural elements such as Li ethnic dances and traditional festivals. After these promotional videos are broadcast on television, online video platforms, and public places like airports and stations, they attract large numbers of tourists. Statistics show that after video placement, Sanya's tourist arrivals increased significantly, with approximately 30% of new visitors attracted by the promotional videos.

6.2 Broadcast Technology Innovating Sanya Cultural Tourism Experiences Virtual Reality (VR) and Augmented Reality (AR): VR and AR technologies are transforming tourist experiences at Sanya's cultural attractions. At the Sanya Romance Show scenic area, VR technology allows tourists to immerse themselves in ancient legends and historical changes. Wearing VR headsets, visitors feel transported to ancient Sanya, witnessing fishermen sailing out to sea and the lives of Li ancestors. AR technology can be applied in Sanya's marine life museum, where tourists scanning exhibits with mobile phones or special devices can see 3D dynamic models of marine creatures and access detailed scientific information, deepening their understanding of Sanya's marine culture.

Interactive Television Programs and Tourist Participation: Interactive television programs supported by broadcast technology add new interactivity to Sanya's cultural tourism. For example, an interactive program about Sanya cuisine production allows tourists to engage using TV remote controls or mobile apps.

7. The Integration Development Path of Xiamen's Broadcast Television Technology and Cultural Tourism Projects

7.1 Creating Highly Attractive Visual Content Visual Presentation Appeal: High-definition filming and production technology from broadcast television has created highly attractive visual promotional content for Xiamen's cultural tourism projects. For example, Gulangyu Island, with its historical charm and unique architecture, is captured in delicate and vivid images through high-definition cameras, showcasing the island's distinctive features including its exotic buildings, winding alleys, and beautiful sea views.

Broadcast Media's Dissemination Power: Xiamen's broadcast media, with its broad audience base, serves as an important platform for cultural tourism promotion. Television stations can launch special tourism programs to introduce Xiamen's cultural tourism resources in depth. For instance, Xiamen Satellite TV has launched tourism special programs that not only showcase popular attractions like Nanputuo Temple and Zengcuo'an but also explore lesser-known but culturally significant sites.

8. Analysis of Xiamen's Successful Cultural Tourism Integration Cases

8.1 Architecture Culture and Tourism Routes The deep integration of Xiamen's historical culture and tourism is exemplified by Gulangyu Island, famous for its unique exotic buildings that blend Chinese and Western architectural styles and serve as important witnesses to Xiamen's historical culture. Local tourism departments have deeply integrated this architectural culture into tourism routes, launching the "Gulangyu Architecture Culture Tour" where visitors can tour famous buildings such as Shuzhuang Garden, Haitian Tangou, and Bagua Tower. Professional guides provide detailed explanations of the historical stories, cultural connotations, and unique architectural styles behind each building. Statistics show that after launching this route, tourists' perception of Gulangyu's cultural connotations increased by approximately 40%, transforming visits from superficial sightseeing to deep cultural understanding.

8.2 Music Culture and Tourism Activities Gulangyu Island, known as the "Island of Music," uses its musical culture as an important calling card. To integrate music culture with tourism, Gulangyu hosts various music cultural tourism activities, such as the Gulangyu International Piano Art Festival, which attracts pianists and music lovers worldwide. During the festival, excellent piano concerts are held in the island's concert halls and outdoor squares, alongside master classes and music culture exhibitions, allowing tourists to immerse themselves in elegant musical atmosphere while enjoying the island's scenery.

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Note: Figure translations are in progress. See original paper for figures.