

AI is Inevitable in the Integration of Liquor and Tourism: Digital Dissemination and Innovative Research on Chinese Baijiu Culture

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Abstract

Purpose – This study explores the internal mechanisms and practical pathways of AI in facilitating the digital communication and innovation of Chinese Baijiu culture under the alcohol-tourism integration.

Design/Methodology/Approach – A multidimensional theoretical framework is constructed by integrating cultural communication theory, innovation diffusion theory, and industrial convergence theory.

Findings – Findings reveal that AI enhances immersive cultural experiences and audience interaction via intelligent content production and targeted dissemination, while also promoting resource integration within the Baijiu industry chain and deepening convergence with the tourism sector.

Research Implications – However, further attention is needed to address ethical and digital governance issues, refine interdisciplinary theoretical models, and advocate for policy support and multi-stakeholder collaboration.

Keywords: Artificial intelligence; Integration of alcohol and tourism;Synergistic innovation in industry

JEL Classifications: Z32,O33,L83

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I. Introduction

On October 28, 2025, the "Proposal of the Central Committee of the Communist Party of China on Formulating the 15th Five-Year Plan for National Economic and Social Development" explicitly outlined the strategy for building China into a tourism powerhouse, building upon multiple national policy documents concerning tourism and the digital economy. With the extensive application of AI technology in the digital economy, AI has provided innovative impetus and technical support for the transformation and upgrading of traditional industries. The "Action Plan for the Innovative Development of Smart Tourism" released in 2024 explicitly proposed leveraging digital technologies to empower traditional cultural industries and tourism, aiming to modernize cultural dissemination and enhance brand influence. During the Third Session of the 14th National People's Congress in 2025, the internationalization and digital transformation of the baijiu (Chinese white liquor) industry, as a vital carrier of Chinese traditional culture, emerged as focal points of policy attention. This created a trifecta of opportunities—policy-driven, technology-empowered, and industry-upgraded—for the digital communication, innovative development, and industrial upgrading of the baijiu sector. The rapid growth of China's baijiu tourism industry can be attributed to the transformation and upgrading of China's broader tourism sector (Bu J et al., 2024). However, given the profound cultural connotations and distinct regional characteristics of baijiu culture, three core challenges remain in promoting the digital expression and value reshaping of baijiu culture, as well as achieving effective integration of AI technology with the baijiu tourism industry: (1) the challenge of aligning cultural dissemination theories with digital technologies; (2) the structural challenge of integrating industrial chains and internationalizing brands; (3) the synergy challenge between technological innovation and industry integration mechanisms.

It is evident that systematically studying digital communication strategies centered around AI in the integrated environment of Liquor and tourism holds significant practical value and strategic importance. This not only aids in enriching the practical expansion of cultural communication theory, especially in promoting the cross-integration of cultural communication and innovation diffusion theory, but also facilitates the transformation, upgrading, and resource restructuring of traditional cultural industries from the perspective of industrial integration. Furthermore, it can provide a reference paradigm for the digital transformation of other traditional cultural industries, further promoting the deep integration of culture and technology, and possesses extensive demonstration value and promotion potential.

This article focuses on the role of AI technology in the digital dissemination and innovation of Chinese Baijiu culture in the context of the integration of Liquor and tourism, attempting to address the following core issues:

- (1) Establish a systematic theoretical framework to effectively explain the cultural dissemination mechanism and its innovation path driven by AI;
- (2) AI technology facilitates the content creation, brand promotion, audience interaction, and the implementation of an empowering mechanism for digital expression and experience innovation in Baijiu culture;

(3) AI promotes technological innovation, resource integration, and industrial synergy, serving as an empowering mechanism for deep integration and value enhancement in the hospitality industry;

(4) Policy and strategy guidance for sustainable development in the context of AI-driven integration of hospitality and tourism

Addressing the aforementioned issues, this paper relies on cultural communication theory, innovation diffusion theory, and industrial integration theory. Through multi-level and multi-perspective theoretical analysis and case study methods, it aims to fill the gap in existing research in the intersection of Liquor-tourism integration and AI digital communication. Its innovative contributions are primarily manifested in two aspects: firstly, proposing a new framework for digital cultural communication that integrates multiple theoretical perspectives, deepening the adaptability and application dimensions of cultural communication theory in the digital environment; secondly, systematically sorting out the mechanism pathways through which AI technology empowers the integration of Baijiu and tourism for the first time, innovatively revealing the micro, meso, and macro mechanisms of technology-driven industrial integration.

This paper addresses the academic community and industry practitioners in the field of cultural industry research and practice. Based on a multi-theoretical framework and employing multi-level analysis and theoretical construction methods, it aims to promote the digital communication and innovation of Chinese Baijiu culture, and facilitate the high-quality development of Liquor -tourism integration.

II. Overview of domestic and international research

The research focuses on three areas: digitalization and cultural communication, digital intelligence technology-driven innovation, and baijiu industry development. Firstly, it concentrates on digitalization and cultural communication research to address challenges in cross-border communication and brand internationalization. Han Yuan et al. (2024) propose that the construction of a digital cultural dissemination system for Chinese culture transcends geopolitical boundaries, posing complex challenges in governance authority and international platform utilization. This necessitates comprehensive planning and institutional innovation to enhance governance capabilities, thereby improving the flexibility and controllability of cultural dissemination. Tang Lirong et al. (2023) propose that LuZhou's rich material and intangible cultural heritage should be integrated with modern industrial tourism resources through cultural and tourism integration to promote the international dissemination of Baijiu culture. This approach facilitates cross-cultural exchange, enhances international recognition, thereby providing strong support for constructing regionally distinctive and innovative intellectual property rights in Liquor culture, and drives the sustainable development of China's Liquor -tourism integration. Li Mingyu et al. (2024) have established a theoretical model of Baijiu culture-driven tourism integration, proposing implementation pathways that offer both theoretical foundations and practical guidance for the integrated development of liquor and tourism industries. **Secondly, it focuses on digital intelligence technology-driven innovation research to resolve issues in upgrading traditional**

industries. Liu Qian et al. (2025) employed a combined method of Qualitative Comparative Analysis (QCA) and panel data to demonstrate that high-level global technological innovation (GTI) emerges not as an isolated factor but as a result of coordinated configuration of digital economy and innovation ecosystem (DIE) elements; they proposed that digital intelligence technologies drive value co-creation in liquor culture-tourism industries through reshaping consumer experiences and promoting multi-stakeholder collaboration, thereby achieving spiral cultural value enhancement and sustainable industry development, providing theoretical foundations and practical pathways for digital intelligence transformation in the wine sector. Cao Lei et al. (2025) argued that digital intelligence achieves breakthrough innovations in traditional craftsmanship enterprises through the interactive effects of organizational support and technological drivers, enabling transformative progress across three core stages - fundamental restructuring, hermeneutic reinterpretation, and creative expansion - thereby overcoming cognitive limitations and capability barriers in heritage innovation under the digital economy, driving corporate innovation transformation with profound impacts. He Cheng et al. (2023) proposed Luzhou Laojiao's high-quality development model driven by technological innovation, intelligent brewing, and quality management upgrades. For instance, scholars Liu D et al. (2025) suggested that previous studies often utilized virtual reality (VR) technologies to establish virtual liquor culture museums for public understanding of traditional liquor culture. However, existing virtual Liquor museums typically employ passive roaming displays lacking interactivity, immersion, and engagement, making it difficult to attract young audiences. A multimodal interactive virtual liquor culture museum system incorporating visual, auditory, tactile, and temperature sensory feedback should be integrated to address these limitations. **Thirdly, it emphasizes baijiu industry development research to tackle brand management and resource integration challenges.** Wang Zentao et al. (2025) argue that traditional brand management strategies struggle to keep pace with the rapid changes in modern markets, prompting baijiu enterprises to enhance private domain and full-spectrum consumer operation capabilities through dynamic brand management and digital transformation. This approach fosters innovative marketing methods, enables precision marketing, thereby improving brand market adaptability and consumer loyalty. Bu Jiandong et al. (2023) reveal that Guizhou Province's baijiu tourism resources exhibit a spatial distribution pattern of "localized concentration and multi-point development," resulting in uneven resource development. Constructing regional collaborative development systems and expanding product development depth and breadth have emerged as critical pathways for high-quality transformation and upgrading of baijiu tourism industries. Li Haihang et al. (2022) propose leveraging new media platforms and AI-driven dissemination to strengthen brand value communication. By co-creating brand culture and jointly shaping brand images with consumers, this approach achieves high recognition and loyalty towards baijiu cultural brands, demonstrating significant practical reference value. Cheng Hong et al. (2024) demonstrate how established enterprises forge new brand identities through brand narrative crafting and dissemination strategy selection, detailing processes and experiences in brand story-driven revitalization.

Based on domestic and international research, digitalization promotes cross-border integration of cultural dissemination, while digital intelligence drives the innovation and upgrading of traditional industries. The Baijiu industry has initially achieved dynamic optimization in brand management and resource integration.

However, three critical issues require urgent resolution: 1. Inadequate transnational cultural governance mechanisms. Although current studies emphasize the transnational characteristics of digital cultural dissemination, there's insufficient systematic design for the division of governance responsibilities among multiple stakeholders, resulting in complex governance mechanisms with low operational efficiency. A more coordinated transnational governance system is needed to enhance overall control capabilities. **2. Limited innovation depth in digital intelligence technology applications.** Existing research primarily focuses on the role of digital intelligence in industrial transformation, but lacks systematic exploration of innovative application mechanisms and comprehensive studies on the deep integration of technology with traditional craftsmanship, making it difficult to achieve sustained and breakthrough innovations. **3. Prominent challenges in resource integration coordination for the Baijiu industry.** Despite uneven spatial distribution of resources, effective strategies for regional collaborative development and resource integration have not been proposed, hindering comprehensive coordination. Strengthening mechanisms for resource integration and brand linkage is urgently needed.

This study constructs a multidimensional framework integrating cultural dissemination, innovation diffusion, and industrial integration theories, based on multi-source data including policies, industry practices, and case studies. It proposes AI-driven strategies for digital cultural communication and industrial coordination mechanisms in Liquor -tourism culture. Key findings reveal: (1) A centralized transnational governance system enhances cultural communication effectiveness and soft power; (2) Deep integration of AI technologies innovates content production and interactive communication models; (3) Data-driven resource integration mechanisms optimize regional collaborative efficiency. The research innovation lies in: (1) Theoretical integration across disciplinary boundaries; (2) Cultural innovation models that deepen technological applications; (3) Resource integration pathways promoting regional collaboration. Empirical evidence demonstrates that this framework effectively addresses bottlenecks such as governance fragmentation, technological superficiality, and uneven resource allocation, thereby advancing the digital transformation of Chinese Baijiu culture and achieving high-quality integration with the liquor-tourism industry.

III. Theoretical framework

Cultural transmission theory, as the primary theoretical foundation of this study, originated from the systematic construction process of communication studies in the 20th century, particularly the impact of evolving communication models and changes in media environments on cultural transmission mechanisms (Sun, Y, 2025). Traditional cultural transmission theory emphasizes the dynamic processes of information dissemination, symbolic interaction, and audience reception, focusing on the selection, transformation, and reproduction of cultural content within transmission channels, as well as the formation mechanisms of cultural identity. Edward T. Hall, the pioneer of cross-cultural communication research, proposed a three-stage evolutionary path of "Differences, Patterns, and Transcendence" that not only reveals the fundamental

logic of cultural interaction but also provides a theoretical trajectory from cognitive conflict to value symbiosis for contemporary cultural exchange (Jiang Ming, 2025). With the development of digital technology, cultural transmission has entered a new stage of digitization and networking, where traditional theories gradually adapt to new media environments, forming a research paradigm of digital cultural transmission that emphasizes cross-border dissemination and interactive experiences in multi-cultural contexts (Cai Yu Ke, 2024). Although digital cultural transmission theory promotes content diversification and channel expansion, it still has limitations in conveying deep cultural connotations, achieving cross-border integration, and innovating values. Particularly in AI-deep integrated scenarios, traditional models struggle to address the complexities of AI-driven content creation, multidimensional interactions, and data dissemination strategies. Therefore, integrating dynamic and intelligent mechanisms is necessary to accurately reflect AI-powered cultural transmission and innovation performance.

On this basis, the innovation diffusion theory provides another crucial theoretical foundation for this study. As a classic theory with multidisciplinary origins, innovation diffusion research has gradually evolved into a relatively independent and comprehensive theoretical system through in-depth exploration across disciplines such as anthropology, communication studies, sociology, and management. It has been widely applied in various fields including new technology adoption, public policy implementation, invention patents, and technological transformation (Ma Jing, Zhang Li, 2024). Originating from communication studies and sociology, this theory focuses on the diffusion pathways and influencing factors of innovations within social systems. It emphasizes how adopter types, communication channels, and social structures constrain the speed and scope of innovation diffusion. By integrating multi-level perspectives involving individual cognition, group interactions, and macro-environmental factors, the theory offers methodological support for analyzing AI-driven cultural innovation. With the rise of digital-intelligent technologies, the innovation diffusion theory has continuously evolved by incorporating new variables such as network environments, platform economics, and user-generated content, thereby expanding its understanding of technological diffusion pathways (Zhao Haixia, 2024). Traditional linear, multi-stage diffusion models in innovation diffusion theory struggle to explain the interactive, adaptive, and dynamic characteristics of AI technologies. In the context of digital dissemination of Baijiu culture integrated with tourism, specific application scenarios and cultural complexity need to be incorporated to address its theoretical limitations in explaining intelligent communication patterns.

This paper constructs a multidimensional interdisciplinary framework integrating cultural transmission and innovation diffusion theories to analyze the core mechanisms of AI-driven digital dissemination of Baijiu culture. The framework proposes an AI-powered digital dissemination model tailored to the unique characteristics of Baijiu culture, emphasizing collaborative innovation in technological content and multi-stakeholder collaboration mechanisms. By integrating micro-level behaviors, meso-level industrial collaboration, and macro-level environmental perspectives, this framework effectively supports systematic analysis of complex Liquor-tourism integration ecosystems. Cultural transmission theory reveals the multiplicity of expression mechanisms on digital platforms, while innovation diffusion theory elucidates the multi-tiered transmission pathways of AI technology across the industrial chain. Together, these theories complement

each other to form a new paradigm for digital cultural dissemination. However, the research has theoretical limitations: traditional theories show inadequate adaptability to AI-driven dynamic content generation and non-linear dissemination, while failing to incorporate industry integration factors such as policy-driven factors and resource allocation.

The theoretical origins of industrial integration trace back to Rosenberg (1963), who first proposed a framework linking technological innovation to the convergence of manufacturing and service sectors, defining this phenomenon as "technological integration" (Müller L, 2025) and (Wang Y, 2025). Industrial integration refers to the economic growth model where different industries or distinct sectors within the same industry break traditional boundaries through technological penetration, resource integration, and business model crossover to form new industrial forms. Essentially, it achieves industrial upgrading and efficiency enhancement through sectoral consolidation. This theoretical framework enables systematic analysis of key factors such as policy drivers, organizational transformations, and resource allocation optimization in regional collaborative development and industry integration, thereby ensuring the completeness and operational feasibility of the theoretical system.

To transcend the limitations of the aforementioned theoretical framework, it is necessary to integrate complex networks with system dynamics theory, strengthen research on dynamic simulation and policy integration, thereby enhancing the practical accuracy of theoretical models. Therefore, the paper integrates the theory of industrial integration in the subsequent analysis to examine how policies, technological algorithms, data resources, and platform ecosystems foster collaborative innovation across different industrial levels, ultimately facilitating the organic integration of Baijiu culture with the tourism industry.

IV. Demonstration

This chapter systematically expounds the intrinsic mechanisms and practical pathways of AI technology in driving the digital dissemination and innovation of Chinese Baijiu culture under the context of liquor-tourism integration, based on the multi-dimensional cross-theoretical framework established in previous chapters. Integrating profound insights from cultural communication theory regarding information transmission, symbolic interaction, and audience reception processes, as well as dynamic descriptions of technological adoption and diffusion from innovation diffusion theory, this study investigates how AI technology reshapes content generation, communication models, and brand value reconstruction in Baijiu culture through three levels: macro policy environment, meso-industry coordination, and micro-enterprise practices. Firstly, it deconstructs the theoretical foundations of digital-cultural integration, revealing structural challenges and transformational demands faced by traditional communication mechanisms under digital environments and intelligent technologies, while emphasizing how AI facilitates innovative breakthroughs through symbolic diversity and interactive complexity in cultural transmission. Subsequently, focusing on the innovative momentum driven by digital intelligence technologies, this study analyzes how policy support, algorithmic systems, data resources,

and platform ecosystems generate collaborative innovation across different industrial levels, promoting organic integration between Baijiu culture and tourism industry, and uncovering new trends of resource integration and value chain extension under technological empowerment. Finally, by examining the cultural attributes and market characteristics of the Baijiu industry, this chapter evaluates the applicability limitations of existing theories, explores the promotional effects of theoretical integration and methodological upgrades on industrial transformation. As illustrated in Figure 1, through multi-perspective argumentation, this study aims to reveal the interactive mechanisms and innovative pathways of AI technology in digital cultural communication and industrial integration, clarifying its strategic value in advancing digital expression of Chinese Baijiu culture, international brand development, and high-quality growth, thereby providing robust theoretical foundations and practical guidance for subsequent empirical analysis and policy recommendations.

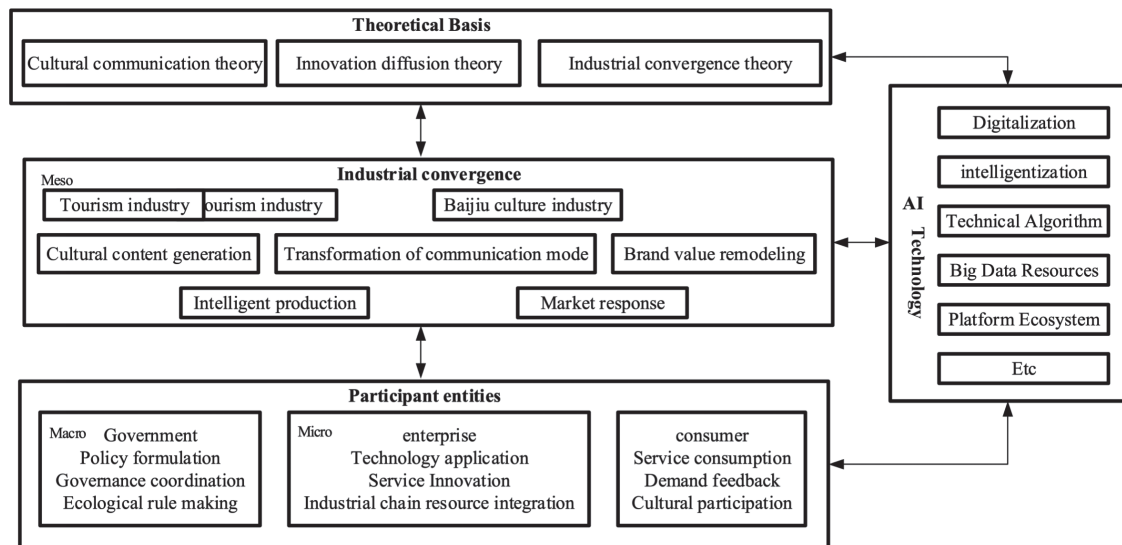


Figure 1. AI-Driven Integration of Liquor -Tourism

1. Theoretical Foundations and Challenges of Digitalization and Cultural Communication

1.1 Analysis of the Association Between Core Theories of Communication Studies and Digital Culture

Cultural dissemination theory is rooted in classical models of information transmission and symbolic interaction, encompassing core paradigms such as the Lasswell Model, Shannon-Weaver Model, and cultural constructivism. It focuses on the dynamic interaction among information encoding, transmission media, and audience decoding, emphasizing symbolic meaning generation and cultural identity formation. The emergence of digital cultural dissemination has compelled these classical theories to confront profound transformations

in the new media environment: communication no longer occurs within traditional linear media but has expanded into a network ecology characterized by multi-platform, multi-mode interweaving, demonstrating high interactivity, personalization, and dynamic updating features. The integration of AI technology has further enabled intelligent content generation, curation, and distribution, blurring the boundaries between sender and audience roles, thereby posing dual challenges to traditional dissemination theories: first, the complexity of media environments surpasses unidirectional transmission models; second, content production mechanisms have evolved from static encoding to dynamic generation, with symbolic co-construction exhibiting non-linearity and concurrency. Although employing this theory as an analytical tool in the liquor-tourism integration context can systematically reveal information flow and symbolic representation in digital environments, elucidate the multidimensional interactivity of cultural content, and explain the shaping of cultural identity through audience participation, its traditional framework inadequately addresses the cultural expression equity considerations arising from AI-driven intelligent content production and algorithmic decision-making. Technological perspectives need to be integrated to enhance explanatory power and critical depth regarding AI-enabled digital cultural dissemination.

1.2 Correspondence Between Policy, Technology, Cultural Elements and Communication Theory

The multi-dimensional attributes of digital cultural dissemination necessitate theoretical interpretations encompassing policy, technology, and culture as three critical dimensions. First, national policies serve as macro-level frameworks, providing institutional guarantees and strategic guidance for the integration of digital economy with cultural industries. For instance, policies promoting digital rural revitalization and cultural tourism integration inject external driving forces into cultural communication empowerment. From a communication theory perspective, the policy environment influences the legitimacy of cultural information and the openness of dissemination channels, creating institutional atmospheres conducive to cultural innovation, which constitutes a key element ensuring effective content innovation and diffusion. Second, technological elements, particularly AI technologies, have become crucial intermediaries and production mechanisms in cultural communication. Technology not only transforms physical forms of communication media but also redefines information encoding and symbolic generation methods. Natural language processing algorithms enable multidimensional interpretation and re-creation of semantic content in Baijiu culture, while machine learning drives personalized content recommendation and audience profiling. However, traditional communication theories demonstrate insufficiency in explaining AI-powered dynamic content generation and network collaborative dissemination. Finally, cultural elements manifest through traditional craftsmanship, historical memory, and social identity embedded in Baijiu as a regional cultural symbol. The transmission of such content relies on communication's precision in interpreting and reproducing cultural contexts. Theoretical concepts of cultural identity and symbolic interaction in communication studies provide frameworks for analyzing multi-layered expressions of cultural elements, emphasizing audiences' active meaning construction and cultural reproduction processes during dissemination. Nevertheless, further exploration is required to

establish specific mechanisms for synergistic innovation between traditional cultural cores and modern digital platforms, particularly in cross-industry scenarios like liquor tourism integration. In conclusion, policy, technology, and culture represent both structural foundations and essential dimensions for theoretical interpretation in digital cultural dissemination, facilitating the construction of multi-layered theoretical interpretation pathways to achieve systematic understanding of Baijiu culture's digital communication.

1.3 Analysis of the Relationship Between This Study and the Tradition of Cultural Communication Research

Traditional research predominantly emphasizes the role of communication media in transmitting cultural symbols and audience reception patterns. However, it inadequately accounts for the multi-source, multi-dimensional, and dynamically interactive characteristics of information in the digital era, while insufficiently exploring the diversification of communication subjects driven by technology and the reinforcement of audience autonomy. To address this theoretical gap, this study constructs an interdisciplinary theoretical framework integrating the Innovation Diffusion Theory, expanding the analytical depth and breadth of cultural dissemination through the perspectives of technology adoption diffusion pathways and multi-layered interactions within social systems. Additionally, current research on cultural dissemination rarely focuses on specific cultural industries such as baijiu culture—a highly regional and ethnic traditional industry—and lacks systematic theoretical refinement regarding digital dissemination mechanisms in the context of liquor -tourism integration. By in-depth analysis of the symbolic system and cultural identity mechanisms of baijiu culture, combined with empowerment pathways through digital media and AI technologies, this research innovatively explores practical paradigms for the integration of traditional culture with modern technology, enhancing the adaptability of cultural dissemination theories to specific industrial integration contexts. Theoretically, this study not only continues the core focus of cultural dissemination on audience interpretation and media environment impacts but also innovatively incorporates the regulatory role of intelligent technology in content production and dissemination strategies, achieving the digital transformation of cultural dissemination theory. Practically, the research outcomes will provide theoretical support for digital dissemination of baijiu culture, promote the deep integration of traditional culture with modern industries, and enrich application paradigms of cultural dissemination research within new media ecosystems.

1.4 Critical Reflection on the Limitations of Cultural Communication Theory in Digital Scenarios

Although cultural transmission theory provides a solid foundation for understanding information flow and the production of symbolic meaning, its traditional paradigms reveal significant adaptability shortcomings when confronted with the digital technological penetration represented by AI. First, classical communication theories rely on linear or limited interaction models that fail to adequately explain complex dynamic processes such as AI-driven content generation, multi-channel real-time distribution, and personalized reception, demonstrating

limitations in elucidating algorithmic influence on communication strategies. Second, while these theories emphasize the social construction of cultural symbols and identity formation, they lack effective analytical frameworks for examining AI-mediated intelligent mutation of cultural content, multi-agent collaborative creation, and data-driven audience behavior prediction. Furthermore, traditional theories fail to provide sufficient critical perspectives regarding issues of communication equity, content diversity, and audience autonomy triggered by information overload, platform monopolization, and algorithmic black boxes in digital environments. Existing theories demonstrate inadequate attention to technological ethics, data governance, and platform ecosystems, which constrain their explanatory power regarding the redefinition of digital cultural transmission values. An urgent need exists to integrate sociotechnical theories and network science to develop theoretical tools adapted to the intelligent era. The subsequent chapter will deepen exploration of the intrinsic dynamics and practical pathways of digital cultural transmission ecosystems through a multi-layered innovation perspective driven by digital intelligence technologies.

2. A Multi-layered Presentation of Innovation Driven by Digital and Intelligent Technologies

2.1 Analysis of Policy Environment and Digital-Intelligent Technology Mechanisms at the Macro-Level

Macroscale policies and institutional frameworks serve as foundational supports for innovation driven by digital intelligence technologies, determining the direction, scope, and depth of technological application. China's strategic deployment for digital economy and intelligent transformation, including the "New Generation Artificial Intelligence Development Plan" (2017), "14th Five-Year Plan for Digital Economy Development" (2021), and "Digital China Construction Action Plan (2025)", provides policy guidance for AI R&D and application while promoting deep integration between cultural industries and tourism. From the perspective of cultural dissemination theory, policies constitute part of a symbolic system that constructs a technological diffusion ecosystem through reshaping cultural information legitimacy and transmission boundaries. The innovation diffusion theory emphasizes that policies, as social system variables, regulate the speed and scope of innovation adoption. In digital dissemination practices, policies offer institutional safeguards for AI applications through optimizing resource allocation, standardizing data sharing, and improving digital infrastructure, thereby advancing cultural information standardization and dynamic updates. For instance, policy-supported cultural big data platform construction significantly enhances the accuracy and efficiency of collecting and disseminating Baijiu cultural symbols, enabling intelligent expression and cross-regional propagation of traditional cultural elements. Simultaneously, public funding guided by policies and market cultivation mechanisms create risk-sharing and entry facilitation for technology enterprises, forming an innovation ecosystem of policy-technology synergy. Technologically, core algorithms such as deep learning and natural language processing overcome information bottlenecks in traditional cultural dissemination through automatic encoding, semantic mining, and personalized recommendations, achieving multimodal expression and precise targeting of cultural content. This

ultimately constructs a closed-loop support system from policy incentives to technological implementation. In summary, macro-level policies provide both motivational impetus and institutional safeguards for digital intelligence innovation. By fostering an open and inclusive innovation environment and promoting infrastructure development, they significantly enhance the application potential of artificial intelligence in digital dissemination of Baijiu culture within the integration of culture and tourism, achieving the modern transformation and global dissemination of traditional culture (Wang, Y, 2025).

2.2 Innovation Patterns in the Industrial Chain at the Meso-Level and Technological Drivers and Explanations

The meso-level focus centers on collaborative innovation between baijiu (Chinese liquor) and tourism industry chains, manifested through dynamic interactions among organizations and groups, as well as resource allocation optimization. According to industrial integration theory, cross-sector ecological cooperation constitutes a critical mechanism for innovation diffusion. AI-driven platform economy and data sharing mechanisms enable efficient integration of information flow, logistics, and value flow. In the context of baijiu-tourism fusion scenarios, AI empowers supply chain management, brand marketing, and customer experience enhancement through intelligent analysis. For instance, enterprises optimize product formulation and cultural content presentation based on consumer preference insights, thereby improving market responsiveness and personalized service quality. From the perspective of cultural dissemination theory, industrial collaboration not only expands channels for cultural symbol propagation but also enhances alignment between cultural content and tourism experiences, intensifying audience immersion. The innovation diffusion theory reveals that adoption strategies and diffusion speed of technological innovations across industry chain nodes are influenced by inter-organizational trust and information sharing. Practically, baijiu and tourism enterprises collaboratively construct intelligent platforms to achieve resource sharing, forming an AI-centric cultural ecosystem that effectively resolves information silos in traditional industries while promoting digital recreation of cultural symbols and cross-industry brand value dissemination. Case studies demonstrate that leading baijiu enterprises leverage intelligent recommendation systems and virtual reality technologies to innovate liquor-tourism integration experiences, achieving organic fusion of cultural connotations with tourism scenarios (L Lin, 2025). Consequently, the meso-industry chain perspective not only reveals systematic patterns of collaborative innovation driven by digital intelligence technologies but also highlights critical pathways for technology-industry ecology mutual reinforcement, establishing foundational mechanisms for digital dissemination of Chinese baijiu culture in tourism integration.

2.3 Detailed Analysis of Technological Applications in Enterprise Cases at the Micro-Level

At the micro level, this study focuses on the practical applications of artificial intelligence (AI) in cultural dissemination and brand innovation by Baijiu enterprises. Based on cultural transmission theory, companies

optimize information encoding and audience decoding processes through intelligent technologies, enhancing the efficiency of digital content production and user experience design. Natural language processing (NLP) enables automated parsing of Baijiu culture texts and generates multi-formatted content, transcending traditional editorial time constraints. Machine learning recommendation systems achieve precise marketing and customer relationship management through behavioral analytics, thereby strengthening brand loyalty. VR/AR technologies deepen cultural identification by creating immersive scenarios, elevating digital experiential quality. The diffusion of innovations theory reveals how micro-level factors like employee skill training and organizational restructuring influence technology conversion efficiency. Case studies demonstrate that AI-powered content platforms significantly enhance market responsiveness through digital processing of cultural materials and multilingual translation, showcasing tangible effects of technological empowerment in cultural dissemination. Intelligent sentiment monitoring enables dynamic adjustment of communication strategies and optimized transmission pathways, facilitating continuous iteration and innovative upgrading of cultural propagation. Thus, micro-level AI applications not only enrich theoretical understanding of digital cultural dissemination practices, but also exemplify how AI technologies concretely transform into corporate competitive advantages, forming an innovative ecosystem where technology, content, and market interact symbiotically (Yuan H, 2025) and (Sun J, 2025).

2.4 A Multilevel Evaluation of the Applicability of the Digital-Intelligent Innovation Theory

In summary, innovations driven by digital intelligence technology exhibit multidimensional and complex interactive characteristics across macro-level policy guidance, meso-level industrial collaboration, and micro-level enterprise technological implementation. The cultural transmission theory effectively explains the symbolic construction and audience interaction in digital cultural expression, while the innovation diffusion theory systematically reveals the technical diffusion pathways, multi-stage processes, influencing factors, and organizational adoption mechanisms. However, both theories demonstrate limitations in explaining AI-driven nonlinear, multi-agent collaborative intelligent dynamic communication ecosystems: macro-level policies struggle to capture micro-level cultural interaction details, meso-level industrial integration complexities exceed the explanatory scope of traditional linear models, and micro-level organizational transformation and cultural adaptation mechanisms require further exploration. Additionally, existing theories inadequately address digital governance issues such as data governance, algorithmic ethics, and platform regulation, failing to comprehensively respond to emerging challenges in digital cultural communication. Future research needs to integrate complex systems theory with digital governance frameworks across multiple dimensions to enhance the comprehensive explanatory power of theoretical models. As analyzed above, the innovation mechanisms under digital intelligence technology not only encompass policy, industry, and enterprise levels but also highlight the importance of interdisciplinary theoretical integration. In the following sections, theoretical extensions and practical implications in the development of China's Baijiu industry will be further explored to deepen systematic understanding and strategic application of AI-enabled digital cultural innovation in liquor

tourism integration.

3. Theoretical Development and Practical Insights in the Chinese Baijiu Industry

3.1 Limitations of Theoretical Application and Analysis of Specific Issues in the Baijiu Industry

Although cultural diffusion and innovation diffusion theories provide a solid theoretical foundation for understanding the digital dissemination and innovation of Baijiu culture, significant limitations emerge when analyzing the digital dissemination of Baijiu culture. The regional cultural attributes and historical inheritance characteristics of the Baijiu industry render its symbolic system highly dependent on customs, craftsmanship, and rituals. Cultural sedimentation during digital transformation risks "symbol dilution" and "cultural drift." Traditional theories predominantly assume cultural dissemination as symbolic circulation and reproduction, neglecting the close connection between cultural elements and material carriers, thereby failing to comprehensively convey traditional brewing processes and their values through digital content. The linear assumptions of innovation diffusion theory conflict with the practical realities of the Baijiu industry, where technological adoption is often constrained by cultural conservatism, regional economic disparities, and market segmentation, creating barriers to AI technology promotion through subjective cognitive obstacles and resource inequality. The integration of Baijiu with tourism represents not only an industrial chain consolidation but also a multidimensional reconstruction of cultural experiences involving cultural identity reshaping and immersive consumption scenarios. These complex cultural dimensions remain inadequately explained by traditional theoretical frameworks. Current theories emphasize industrial collaboration mechanisms and innovation diffusion pathways when analyzing industry integration, yet overlook deeper cultural needs such as intangible cultural heritage protection and cultural identity reconstruction. Additionally, traditional theories lack effective analytical tools for addressing ethical issues like algorithmic transparency and platform monopolies in digital ecosystems, proving inadequate in confronting challenges to communication equity and social ethics posed by evolving digital power structures. Therefore, the unique attributes of the Baijiu industry and the complexity of its integration necessitate theoretical localized innovation and expansion to accommodate the diverse requirements of AI-driven digital cultural dissemination.

3.2 Theoretical Integration and Methodological Advancement Facilitate Industrial Innovation Pathways

To address theoretical limitations, cross-disciplinary theoretical integration and methodological innovation are required to advance digital communication in China's Baijiu industry. First, by introducing the ecosystem perspective of industrial integration theory, we can transcend the limitations of traditional linear supply chain analysis to explore the symbiotic relationship between Baijiu culture and tourism industry, thereby constructing a multidimensional integration framework encompassing cultural symbols, experience design, and technology

platforms. Second, integrating innovation diffusion theory with complex systems theory enables us to capture nonlinear diffusion patterns, feedback adjustments, and multi-agent game mechanisms in technology adoption, enhancing understanding of path diversity in technological application and innovation resistance. The cultural communication theory must incorporate perspectives from digital governance, algorithmic ethics, and platform studies to establish a new explanatory framework for digital communication power structures. Methodologically, a mixed-research approach combining quantitative big data analysis with qualitative case studies will precisely measure and interpret AI-driven content generation, personalized recommendations, and user engagement behaviors. Furthermore, by introducing user research and experience design theories, we can analyze mechanisms of cultural identity construction within digital content and virtual scenarios, providing operational guidance for Baijiu culture reconstruction and optimized communication strategies in virtual environments. Ultimately, integrating policy studies and technological sociology perspectives facilitates the establishment of industry-academia-research collaboration platforms to ensure ethical technology practices and social responsibility. Through theoretical convergence and methodological advancement, this approach compensates for the explanatory limitations of single-theory frameworks, driving the transformation of cultural communication from symbolic transmission to value co-creation.

3.3 Implications for Industry Innovation, Policy Formulation, and Social Value

Theoretical expansion and methodological updates reveal multi-dimensional innovation mechanisms, offering significant references and practical insights for the baijiu industry and related sectors. First, at the industry innovation level, emphasis should be placed on constructing a culture-driven intelligent production and dissemination model through technological innovation. Baijiu enterprises should leverage AI technologies to achieve multi-modal digital reconstruction of cultural symbols, combined with virtual reality (VR) and augmented reality (AR) product experiences, thereby enhancing consumers' cultural identification and immersive engagement (Cuomo, M. T, 2025).

Second, policy-level analysis highlights the necessity of establishing a digital ecological legal framework and innovation guidance system. This requires strengthening regulations on digital copyrights, data security, and algorithm transparency to promote equitable sharing of cultural digital assets while preventing dissemination inequities caused by digital divides and platform monopolies. Cross-departmental collaboration and cross-industry innovation funds should also be supported to advance integration of liquor tourism with internet technologies, fostering an open industrial ecosystem. Finally, from a social value perspective, intelligent dissemination achieves dual empowerment of cultural heritage preservation and regional economic development, injecting cultural-technological momentum into rural revitalization. The digitalization of baijiu culture not only enhances dissemination efficiency and coverage but also strengthens public engagement and cultural identification through interactive platforms, thereby promoting cultural soft power enhancement and social inclusiveness. The innovation-driven integration of liquor tourism exemplifies the unification of cultural value and social responsibility, facilitating economic transformation while safeguarding and revitalizing cultural heritage.

3.4 Comprehensive Evaluation of Argument Content and Guidelines for Future Research Directions

The preceding analysis highlights the limitations of traditional cultural dissemination and innovation diffusion theories in the digital transformation of Baijiu culture, particularly their inadequate responses to challenges such as cultural specificity, non-linear adoption of technology, and digital governance. By constructing an interdisciplinary model integrating ecosystem perspectives, complex systems approaches, and digital governance frameworks, the systematic explanatory power of AI-driven liquor-tourism integration mechanisms has been enhanced. These practical insights provide effective support for industrial innovation, policy formulation, and social value creation, demonstrating the synergistic effects between theoretical research and practical application. In summary, the digital dissemination of Baijiu culture in liquor-tourism integration constitutes a systemic engineering involving intertwined technological, industrial, and social factors, requiring continuous dynamic innovation in theory and practice. Future research should focus on AI technology ethics, protection of digital subject rights, and data governance mechanisms, deepen assessments of digital content quality and social impacts, and establish a new digital cultural communication ecosystem that is open, inclusive, and sustainable..

V. Conclusion

This study systematically examines how artificial intelligence (AI) drives the digital dissemination and innovation mechanisms of Chinese Baijiu culture in the context of liquor-tourism integration. Through constructing a multi-dimensional interdisciplinary theoretical framework encompassing cultural transmission, innovation diffusion, and industrial integration theories, it analyzes the multi-layered operational mechanisms of AI technology in policy guidance, industrial chain coordination, and corporate practices. The research reveals the intrinsic patterns of cultural essence digital reconstruction and innovative dissemination models. The analysis demonstrates that AI, as a core driver of liquor-tourism industrial integration, facilitates paradigm transformation in cultural expression through intelligent content creation and precision dissemination. Simultaneously, it achieves industrial resource integration and global brand positioning, significantly enhancing the immersion and interactivity of cultural experiences. Ultimately, it establishes a "technology-culture-industry" trinity digital ecological evolution model. This research breaks through the linear paradigm of traditional cultural dissemination, forming a dynamic system of element co-construction. While realizing cultural value appreciation, it provides verifiable methodological support for the digital transformation of traditional industries.

Practically, the study verifies through typical cases the empowering effects of AI technology in liquor-tourism scenarios, offering operational implementation pathways for rural revitalization and cultural confidence construction. However, theoretical gaps persist in dimensions such as technical ethics, digital governance, and cross-cultural comparisons, particularly requiring deeper exploration in critical areas like data ownership and

algorithm transparency. Although focused on digital dissemination of Chinese Baijiu culture within liquor-tourism integration, this study acknowledges limitations in theoretical frameworks and case scale. Future research should prioritize building a digital governance system balancing technological innovation and cultural security, refining interdisciplinary theoretical models, and strengthening multi-stakeholder collaboration mechanisms. Key explorations recommended include: 1) Equitable mechanisms for cultural digital assets utilization; 2) Quality assessment systems for generative AI content; 3) Cross-cultural communication effectiveness in global contexts. These investigations will facilitate the construction of sustainable digital cultural ecosystems, enable traditional cultural industries to achieve value leapfrog in global digital economy, and provide innovative solutions with both theoretical depth and practical efficacy for cultural soft power development.

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