Global Review of Humanities, Arts, and Society (GRHAS)

Vol. 1, No. 1, 2025 | pp. 25–38

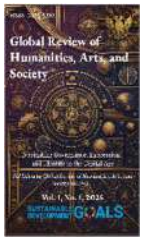
EISSN: 3052-539X (Online Only)

https://doi.org/10.63802/grhas.v1.i1.12



Navigating Governance, Expression, and Identity in the Digital Age

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Cultural and Tourism Integration in Chongqing City: Digital Economy and High-Quality Growth

***Congmin Zhang*[1*]**

[1]*Chongqing Metropolitan College of Science and Technology*

Abstract

The synergy between culture and tourism is crucial in driving urban digital traffic and fostering economic vitality. Within the framework of the digital economy, their symbiotic relationship is further amplified by digital technology, which catalyzes high-quality development. Digital advancements are reshaping these sectors by optimizing production processes, refining market segmentation, and innovating revenue distribution mechanisms. Furthermore, digital tools enable real-time monitoring of market dynamics, improving efficiency and adaptability while fostering strategic decision-making for cultural and tourism enterprises. This paper examines the integrated development of culture and tourism through a case study of Chongqing City, China, utilizing panel data from 2010 to 2021. By analyzing the interaction between these two sectors and the transformative role of digital technology, the study provides valuable insights into their mutual reinforcement and contributions to sustainable urban growth in the digital era, offering a model for other cities navigating similar digital transformations.

Keywords: Economic growth, Digital economy, Integration of culture and tourism

[1] **Congmin Zhang**, Department of Accounting, Faculty of Business and Economics, Chongqing Metropolitan College of Science and Technology, Chongqing, China

* Corresponding author E-mail: congminzhangzcm@gmail.com

1. Introduction

The radiation and penetration effects between the cultural and tourism industries can enhance the dependence between the two industries, strengthen integration, and promote development (Zhang & Wang, 2010). The "Statistical Classification of Digital Economy and Its Industries" standard, issued in 2021, categorizes the cultural industry and tourism as digital improvement industries that enhance the output and efficiency of traditional industries through digital technology and data resources, thereby integrating with the real economy. The tourism industry, which utilizes information technology, falls under the subcategory of digital business services within the medium category of digital commerce. In contrast, the cultural and artistic activities that fully integrate digital technology and are carried out with the aid of digital equipment are classified under the category of Internet culture and genre within the Other Digital Efficiency Improvement Industries Entertainment Industry Subcategory.

The digital economy plays a pivotal role in transforming the traditional cultural and tourism sectors by enhancing their efficiency, reach, and innovation capabilities. Digital technologies—such as big data, cloud computing, artificial intelligence, and virtual and augmented reality—are reshaping how cultural content is produced, disseminated, and consumed while also revolutionizing tourist experiences and service delivery (Jiang, 2023). These advancements enable more precise market segmentation, real-time decision-making, and immersive experiences, thus deepening the integration between culture and tourism and facilitating high-quality development.

In 2022, China's cultural and tourism industries are expected to operate at a low level. For example, the supply of cultural tourism products has declined while consumption has been suppressed, resulting in a downward trend in demand. However, digital technology drives industrial development and optimizes the ecological environment of the cultural and tourism industries (Fan, 2023). According to the 2022 Chongqing Tourism Statistical Bulletin, released by the Chongqing Culture and Tourism Development Committee in May 2023, there will be 98 municipal-level critical cultural and tourism industry projects from 2022 to 2024, with an estimated total investment of over 360 billion yuan. The "one district, two groups" tourism industry plan by Chongqing City has performed well. The tourism industry accounted for 3.4%, 3.8% and 5.3% of GDP respectively. Among them, the growth rate of the tourism industry's added value in the central city of Chongqing was -3%. The growth rate of the added value of the tourism industry in the urban agglomeration of the Three Gorges Reservoir area in northeast Chongqing and the Wuling Mountain urban agglomeration in southeast Chongqing was 4.1% and 5.9%, respectively. In 2022, although Chongqing will be affected

by disasters such as COVID-19, high temperatures, and drought, Chongqing will rank first among the tourist destinations that Chinese people most want to visit in the post-epidemic era. Chongqing, as one of China's four municipalities directly under the central government and a key hub in the western region, has unique geographic, economic, and cultural characteristics that make it a representative case for studying cultural and tourism integration. The city is known for its rich intangible cultural heritage, vibrant performing arts, and rapidly expanding tourism industry. In recent years, Chongqing has actively promoted the integration of culture and tourism through policies, infrastructure investments, and digital innovation, positioning itself as a national demonstration zone for cultural tourism development. Therefore, examining Chongqing's experience offers valuable insights for other cities pursuing similar integrated development paths.

2. Literature Review

Many scholars have conducted relevant research to assess the level of development in the cultural industry. Yuan and Wu (2012) measured the efficiency of China's cultural industry from five aspects: human capital, enterprise scale, agglomeration economy, market demand, and industrial policy. They pointed out that the local market effect (also known as the home market effect) and urbanization economy promote the improvement of cultural industry efficiency. Wang and Liang (2021) identified the influencing factors of cultural industry efficiency as human capital, cultural undertaking development, cultural market potential, cultural industry infrastructure, and the number of cultural units, which positively and significantly impact them. Zhou and Yin (2023) selected capital input and labor input as input indicators and the operating income of cultural market institutions as output indicators. They developed an evaluation index system to assess the efficiency of the cultural industry. Wei et al. (2022) noted that the high-quality development of the cultural industry must begin from five key perspectives: innovation, coordination, integration, openness, and sharing. They adopted the projection pursuit and obstacle models to measure the level and analyzed the factors hindering development.

Similarly, numerous explorations have been conducted to measure tourism development. Dwyer (2022) developed a framework from the perspective of well-being, highlighting that the ability to expand regional tourism needs to be reconsidered from the perspectives of tourism planning, resource development, resource management, and tourism marketing, with a focus on regional competitiveness and residents' well-being, including material aspects. The relationship among factors such as income, employment, living environment, education, work-life balance, and ecological environment. To construct a model of environmental performance and

tourism industry company performance, an empirical analysis is conducted using variables related to sustainability initiatives, eco-friendly practices, resource efficiency, waste reduction, carbon footprint, financial performance, market competitiveness, customer satisfaction, and brand reputation. Tan et al. (2017) find that enhancing the sense of responsibility for environmental protection and implementing sustainable development can improve the long-term competitiveness of tourism companies, influencing consumers' travel destination choices.

Liu et al. (2020) comprehensively evaluated the cultural and tourism industries using six indicators, including industrial base, industrial human capital, and industrial effect. They compared consumer demand, market supply, technological innovation, policy environment, infrastructure, and Human resource elements as the driving forces of cultural tourism coordination. Through the combination of four aspects—agricultural resources, healthcare resources, tourism, and culture —Luo (2022) discusses industrial integration and development for regional industrial revitalization, cultural revitalization, talent revitalization, and promoting rural economic development. The Indonesian government promotes rural tourism development and enhances villagers' participation to achieve independent rural development. Among them, the harmonious culture and sustainable tourism project integrates cultural elements into tourism, promoting the sustainable development of the region's economy, society, and culture (Astawa et al., 2018). People must also protect culture in the integrated development of culture and tourism. Malaysia has prosperous tourism resources. While heritage and artistic resources are highly attractive to tourists, the preservation of these cultural assets necessitates coordinated efforts among various stakeholders, including government authorities, tourism operators, and cultural industry managers (Ismail et al., 2014). Such collaboration is essential for maximizing cultural value and ensuring the sustainable development of tourism. The improvement of cultural awareness and the growth of willingness to learn have promoted the vigorous development of cultural tourism worldwide (Han et al., 2019). And the involvement of technology cannot be ignored. In the context of cultural and tourism integration in traditional villages, digital intelligence technologies have undergone iterative evolution—from digitization to digitalization and ultimately to intelligentization—and have become a key driving force in advancing the integration process (Zhang et al., 2024). These technologies enable the comprehensive recording and preservation of local agricultural, cultural, and tourism resources, facilitating their representation across temporal and spatial dimensions to support cultural inheritance (Yang & Ning, 2024).

3. Methodology and Data

To investigate and study the integration and development of Chongqing's cultural and tourism industries and accurately reflect the results of regional industry integration, this paper primarily utilizes secondary data from the China Statistical Yearbook and the Chongqing Statistical Yearbook. The data select the statistical data of the last 12 years, from 2010 to 2021. The period was chosen for its strategic significance in China's socioeconomic planning. This timeframe spans the 12th and 13th Five-Year Plans, marking a critical phase in the evolution of China's digital economy. During this period, Chongqing saw substantial investments in cultural and tourism sectors and implemented several policy initiatives promoting industrial integration. Moreover, this decade has witnessed the accelerated adoption of digital technologies, providing a valuable context for analyzing the transformation of traditional industries under the influence of digital technologies.

This paper will use the entropy weight method and the coupling coordination degree model to analyze the integrated development of Chongqing's culture and tourism industry. First, the entropy weight method is used to determine the objective weight of the index. The entropy value of the index and the weight are negatively correlated; that is to say, the larger the entropy value of the index, the smaller the degree of dispersion, and the lower the weight. Since this article examines the integration of the two industries of culture and tourism, both industries are of equal importance in the integration process. Therefore, the weights will be set to 0.5, and further adjustments will be made based on the results of the entropy weight calculation.

When using the entropy weight method to determine the proportion of indicators for integrating Chongqing's cultural and tourism industries, it is necessary to eliminate the dimensional relationship, magnitude relationship, and positive and negative indicators between different indicators to facilitate comparison. This paper adopts a standardized treatment method:

Positive indicators:

$$X'_{ij} = \frac{X_{ij} - minX_j}{maxX_j - minX_j} \quad (1)$$

Negative indicators:

$$X'_{ij} = \frac{maxX_j - X_{ij}}{maxX_j - minX_j} \quad (2)$$

Among them, i represents the year, and j represents the index item.

Then calculate the proportion of the indicator:

$$Y_{ij} = \frac{X'_{ij}}{\sum_{i=1}^{n} X'_{ij}} \quad (3)$$

Then calculate the information entropy:

$$e_j = -m\sum_{i=1}^{n}(Y_{ij} * \ln Y_{ij}) \quad , \quad (4)$$

$$m = \frac{1}{\ln n}$$

Finally, determine the index weight value:

$$w_j = \frac{k_j}{\sum_{j=1}^{h} k_j},\ k_j = 1 - e_j \quad (5)$$

Among them, n represents the year of evaluation, and h represents the number of indicators.

Comprehensively evaluate the integration of Chongqing's culture and tourism industry through the calculated index weights:

$$V = \sum_{i=1}^{2}\sum_{j-1}^{h}(w_j X'_{ij}) \quad (6)$$

A coupling coordination degree is currently widely used to measure the level of coordinated development among various entities. Coupling is the process in which two or more systems are combined and gradually integrated through mutual influence and interaction. By combining relevant literature, it is found that there is a mutual influence and promotion between culture and the tourism industry, resulting in a gradual integration that forms an organic whole. This paper aims to establish a coupling system between Chongqing's cultural and tourism industries.

Firstly, construct the coupling coordination degree model of Chongqing's cultural industry and tourism industry to measure the degree of integrated development of the cultural and tourism industry:

$$D = \sqrt{C * I} \quad (7)$$

Among them, M_1 represents the comprehensive score of the tourism industry, M_2 represents the comprehensive score of the cultural industry, $C = \sqrt{\frac{M_1 * M_2}{(\frac{M_1+M_2}{2})^2}}$, where $C \in [0,1]$ the value of C is proportional to the degree of coupling; $I = \frac{(\frac{M_1+M_2}{2}+\sqrt{M_1*M_2})}{2}$ is the comprehensive development index of the culture and tourism industry, and D stands for coupling coordination. The greater the value of D, the better the coupling state of the two systems.

4. Analysis and results

This article divides the tourism and cultural industries into two major categories. It selects the total number of tourist attractions, Total number of people received at tourist attractions, Number of Overseas Visitor Arrivals Received, Average Staying Period of Overseas Visitors per Capita 4 tourism industries Subsystem, and Specialized Troupes, Number of Cultural Property Institutions, Cultural undertaking expenses, Number of exhibitions held in Cultural Centers and Art Centers, Number of

domestic performances of Specialized Troupes and Number of domestic audiences six cultural subsystems, for Chongqing City cultural industry Entropy weight, and coupling analysis are carried out for the integration and development of tourism indus

Table 1: Evaluation indexes and weight of integrated culture and tourism industry in Chongqing

Subsystem	Individual Indicators	Indicator properties	Entropy	Redundancy	Weight
Tourism	Total number of tourist attractions (Unit)	+	0.90659	0.09341	0.17253
	Total number of people received in tourist attractions (1 million person-times)	+	0.85760	0.14240	0.26302
	Number of Overseas Visitor Arrivals Received (1 billion people)	+	0.91015	0.08985	0.16597
	Average Staying Period of Overseas Visitors per Capita(Day)	+	0.78426	0.21574	0.39848
Culture	Specialized Troupes (Unit)	+	0.85336	0.14664	0.19240
	Number of Cultural Property Institutions (Unit）	+	0.90494	0.09506	0.12472
	Cultural undertaking expenses (1 million yuan)	+	0.85914	0.14086	0.18481
	Number of exhibitions held in Cultural Centers and Art Centers(Times)	+	0.89548	0.10452	0.13713
	Number of domestic performances of Specialized Troupes （Times）	+	0.87535	0.12465	0.16355
	Number of domestic audiences（1 million visitors）	+	0.84956	0.15044	0.19738

Table 2: Integration coupling degree and coupling coordination degree of culture and tourism industry

Year	Comprehensive Value of Coupling Degree of Tourism	Comprehensive Value of Coupling Degree of Culture	Comprehensive Development Index	Coupling Coordination Index
2010	0.1905	0.4313	0.3109	0.5354
2011	0.3514	0.3224	0.3369	0.5802
2012	0.2833	0.2834	0.2834	0.5323
2013	0.2450	0.3384	0.2917	0.5366
2014	0.2526	0.3433	0.2980	0.5427
2015	0.2919	0.4315	0.3617	0.5958
2016	0.3614	0.4652	0.4133	0.6403
2017	0.4426	0.6010	0.5218	0.7182
2018	0.5683	0.7671	0.6677	0.8125
2019	0.6213	0.6022	0.6118	0.7821
2020	0.6134	0.4105	0.5119	0.7084
2021	0.7179	0.4100	0.5639	0.7366

According to the analysis results, from 2010 to 2021, the tourism and cultural industries have generally experienced fluctuating development. However, the development speed of the tourism industry is faster than that of the cultural industry. From the perspective of the indicator system and the integration of culture and tourism, prior to 2018, Chongqing was primarily in the stage of lagging behind in tourism integration development. However, after 2018, the tourism industry experienced rapid development. Judging from the comprehensive score, the cultural industry in Chongqing needs to catch up to the tourism industry. The coupling coordination interval from 2010 to 2021 is [0.5323,0.8125]. Based on the standards for the division of coupling and coordinated development levels, the integrated development of Chongqing's culture and tourism is currently in a coordinated and rising stage, progressing from primary coordination to intermediate coordination, and is expected to achieve advanced coupling by 2018.

From 2010 to 2021, it encompasses four 'five-year plans' in China, fully covering the 12th and 13th five-year plans. During this period, Chongqing made substantial efforts to develop cultural and tourism industries. From 2011 to 2015, Chongqing City proposed improving social and cultural facilities and establishing a comprehensive public cultural service system that covers both urban and rural areas. He also pointed out that Chongqing's investment in the cultural industry has a high growth rate, low total amount, and poor cultural originality. In developing the tourism industry, it is necessary to enhance integration with other industries, play a role as an association and driver, and improve infrastructure construction to enhance international Competitiveness. In the 13th plan period, Chongqing City proposed the need to integrate tourism and the Internet industry, make the tourism industry digital, convenient, and intelligent in the entire industry chain, and proposed to implement wireless local area networks in tourist hotels and tourist attractions above three stars coverage, to realize the construction of the Internet of Things in tourist areas. At the same time, the tourism industry is required to enhance the level of international openness and form international tourism groups, hotels, and travel agencies to attract international tourists. Moreover, the development plan proposes combining scenic tourism with Chongqing culture, building characteristic boutique tourist routes, and enhancing the region's attractiveness.

Under the guidance of relevant policies, Chongqing's culture and tourism industry has experienced rapid development over the past 12 years. The infrastructure of the cultural industry has undergone continuous improvement, with investment continuing to increase. The tourism industry has undergone rapid improvement, and industrial integration and driving capabilities have increased accordingly. In 2021, China introduced its 14th Five-Year Plan. The cultural and tourism industries have

emphasized the creation of highlands for the integrated development of cultural and tourism activities, including tourism performance demonstration areas, cultural and creative tourism products, and brand building for cultural and tourism events. etc., utilize digital technology to foster high-level integration between the culture and tourism industries, driving regional economic growth.

5. Conclusion

As one of the most popular tourist destinations in China, Chongqing's coordinated and integrated development of culture and tourism has significantly contributed to regional economic growth. With the national agenda emphasizing the role of digital technologies in empowering cultural and tourism industries and promoting high-quality development, it is imperative to adopt a more systematic and stakeholder-specific strategy. Jin (2018) emphasized that the model and structure of economic development must respond to the real needs of the people. Wei and Li (2018) highlighted that the assessment of high-quality development should integrate both the quality of processes and outcomes. In this context, Chongqing should continue to strengthen its digital capabilities to promote the integrated and coordinated development of culture and tourism in alignment with the five development principles of "innovation, coordination, greenness, openness, and sharing" in the digital economy.

To further advance the integration of culture and tourism, a coordinated approach involving key stakeholders is essential. Government authorities should prioritize the improvement of digital infrastructure in cultural and tourism zones, refine cultural policy frameworks, and provide both financial and institutional support to facilitate digital transformation. At the same time, promoting regional equity and safeguarding cultural heritage through digital preservation initiatives are crucial for sustainable development. Enterprises in the cultural and tourism sectors are encouraged to enhance their capacity for delivering digitalized tourism products, invest in immersive technologies such as augmented and virtual reality, and leverage data analytics to better understand consumer preferences and improve marketing strategies. In parallel, technology providers play a pivotal role by developing AI-driven solutions for analyzing tourist behavior and optimizing service delivery, offering cloud-based platforms for cross-sector integration, and supporting the digitization and dissemination of cultural resources through advanced technological tools. Through the collaborative efforts of these actors, the high-quality integration of culture and tourism can be further accelerated, contributing to a more innovative, inclusive, and resilient regional economy.

These coordinated efforts among stakeholders will accelerate the formation of a more resilient, innovative, and sustainable model of cultural and tourism integration

in Chongqing. Looking ahead, Chongqing is poised to further integrate its cultural and tourism industries at a high level, becoming a culturally dynamic and globally recognized tourist destination.

Acknowledgment: This work was supported by the Chongqing Education Commission Key Project 2022: Integrated Development of Culture and Tourism in Chengdu-Chongqing Twin Cities Economic Circle (KJZD-K202202503)

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