

Study on the Coupling Coordination and Driving Factors of Provincial Digital Economy and High Quality Development of Tourism Industry

Yanhui Xie

Xi'an Technology and Business College, Xi'an, Shaanxi, 710200, China

Abstract. With the rapid progress of information technology, unprecedented changes have been brought to various industries. As an important component of the national economy, the tourism industry has become increasingly closely coupled and coordinated with the digital economy in its development. This article aims to analyze the coupling and coordination relationship between the provincial digital economy and the high-quality development of the tourism industry, reveal the inherent correlation and interaction mechanism between the two, and explore the key factors that affect the degree of coupling and coordination, providing reference suggestions for policy makers to promote the high-quality development of the tourism industry.

Keywords: Digital Economy; Tourism Industry; High Quality Development; Coupling Coordination; Driving Factors.

1. Introduction

In today's rapidly developing digital economy era, the rapid progress of information technology has brought unprecedented changes to various industries. Among them, the tourism industry, as an important component of the national economy, has an increasingly close coupling and coordination relationship with the digital economy in its development. With the widespread application of technologies such as cloud computing, big data, and artificial intelligence, the tourism industry is undergoing a profound transformation driven by digitization. This not only improves the efficiency and quality of tourism services, but also brings more diverse tourism experiences to tourists. However, how to ensure the coordinated development between the two and promote the high-quality development of the tourism industry is still an urgent problem that needs to be solved. Especially at the provincial level, due to significant differences in economic development levels, industrial structures, and resource endowments among different regions, the coupling and coordination relationship between the digital economy and the tourism industry has shown diversification. Therefore, studying the coupling and coordination relationship between provincial digital economy and high-quality development of tourism industry, as well as its driving factors, is of great significance for promoting regional economic transformation and upgrading, and achieving sustainable development.

This article aims to analyze the coupling and coordination relationship between provincial digital economy and high-quality development of tourism industry, reveal the internal correlation and interaction mechanism between the two, and explore the key factors affecting the coupling and coordination degree, reveal the regularity of the development of provincial digital economy and tourism industry, deepen the understanding of the coupling and coordination relationship between digital economy and tourism industry, enrich and develop the theoretical system in related fields, and provide valuable reference information for policy makers to better grasp the trends and laws of digital economy and tourism industry development, formulate more scientific and reasonable policy measures, and also provide useful inspiration for tourism enterprises and related practitioners to actively embrace the digital economy and promote the high-quality development of tourism industry.

2. Analysis of the Current Situation of Digital Economy and Tourism Industry Development

(1) Current Development Status of Digital Economy

1) The scale and structure of the digital economy

Currently, the digital economy is undergoing a rapid development stage and has become a new engine driving economic growth. In terms of scale, the scale of China's digital economy is growing rapidly, and the proportion of digital economy in China's GDP is increasing year by year, showing a strong growth momentum. This growth is mainly due to the widespread application and innovation of technologies such as cloud computing, big data, and artificial intelligence. In 2022, the scale of China's digital economy reached 50.2 trillion yuan, with a year-on-year nominal growth of 10.3%, accounting for 41.5% of GDP, which is equivalent to the proportion of the secondary industry in the national economy. This indicates that the digital economy has become an important component of China's national economy, and its contribution to economic growth is becoming increasingly significant. Preliminary calculations show that the scale of China's digital economy will reach 56.1 trillion yuan in 2023, accounting for over 44% of GDP. This indicates that the scale of China's digital economy will continue to maintain a rapid growth trend in the coming years. In addition, the total factor productivity of China's digital economy has increased from 1.66 in 2012 to 1.75 in 2022, and the level of digital economy productivity and its year-on-year growth rate are significantly higher than the overall national economic production efficiency. From this, it can be seen that digital economics has played an important role in promoting the improvement of national economic production efficiency. In short, the scale of China's digital economy is rapidly growing, and the digital economy has become a new engine for promoting high-quality economic development.

In terms of structure, the digital economy covers many fields, including digital industrialization, such as electronic information manufacturing, telecommunications, software and information technology services, the Internet industry, etc; Industrial digitalization, such as industrial Internet, intelligent manufacturing, Internet of Vehicles, platform economy, etc; Digital governance, including digital government, smart cities, etc; Data value refers to the process of using valued data as a factor of production and incorporating it into the fifth largest factor of production. In addition, the digital economy also includes various application scenarios such as e-commerce, mobile payments, digital advertising, digital media, intelligent manufacturing, digital healthcare, digital education, etc., all of which are important components of the digital economy. In 2022, the scale of digital industrialization and industrial digitization in China reached 9.2 trillion yuan and 41 trillion yuan respectively, accounting for 18.3% and 81.7% of the digital economy, demonstrating the "28" proportion structure of the digital economy. Among the three industries, the penetration rates of the digital economy are 44.7% (in the tertiary industry), 24.0% (in the secondary industry), and 10.5% (in the primary industry), respectively, indicating a pattern of digitalization driving development in the service industry and industry. These data reflect the rapid growth of China's digital economy and its important role in the national economy, while also revealing the potential and direction of future development of the digital economy.

In short, the digital economy has penetrated into various aspects of social life and become a new engine for promoting high-quality economic development.

2) Digital Economy and Tourism Related Policies

The "14th Five Year Plan" Tourism Development Plan clearly states that "we should accelerate the promotion of smart tourism characterized by digitalization, networking and intelligence, deepen 'Internet plus tourism', and expand the application of new technology scenarios." This shows that the government has taken positive measures to promote the deep integration of digital economy and tourism.

(2) Current Development Status of Tourism Industry

1) The scale and structure of the tourism industry

As an important component of the economy, the tourism industry has also achieved significant development in recent years. In terms of scale, the tourism industry has achieved rapid growth in both reception and revenue. According to relevant data from the Ministry of Culture and Tourism, in the first quarter of 2024, the number of domestic tourists reached 1.419 billion, an increase of 203 million compared to the same period last year and a year-on-year increase of 16.7%. Among them, the number of domestic tourists for urban residents reached 1.077 billion, a year-on-year increase of 14.1%; The number of domestic trips by rural residents was 342 million, a year-on-year increase of 25.7%. The total cost of domestic tourists traveling was 1.52 trillion yuan, an increase of 0.22 trillion yuan from the previous year and a year-on-year increase of 17.0%. Among them, urban residents spent 1.29 trillion yuan on travel, a year-on-year increase of 15.4%; Rural residents spent 0.23 trillion yuan on travel, a year-on-year increase of 26.9%. This indicates that China's tourism market has strong market demand.

In terms of structure, the tourism market shows a trend of diversification and diversity, with popular tourist destinations not limited to traditional scenic spots, but also favored by tourists such as internet famous cities, cultural ancient cities, rural tourism, and seaside vacations. At the same time, tourism methods are becoming increasingly diverse, with unique features such as self driving tours, group tours, and customized tours. In terms of age structure, according to the annual report on domestic tourism development in China, middle-aged and elderly tourists have become an important source of tourists in the tourism market, with 1.194 billion middle-aged and elderly tourists aged 45 and above traveling, accounting for 36.81% of the market. The rapid growth rate of young tourists aged 14 and below indicates that "one old and one young" has become a highlight and focus of the tourism market. From the perspective of regional differences, the eastern region is the main source of domestic tourism revenue, accounting for 38.55% of the total national revenue, while the northeastern region has the lowest tourism revenue, only accounting for 5.49%. Urban clusters such as Beijing Tianjin Hebei, Yangtze River Delta, and Chengdu Chongqing have become gathering centers for tourism passenger flow, playing a role as locomotives and ballast stones for the prosperity of the tourism economy

2) The current status of high-quality development in the tourism industry

In terms of improving tourist satisfaction, various "petting tourists" measures have been launched in various regions, effectively enhancing tourist satisfaction. The comprehensive index of national tourist satisfaction remains at a satisfactory level, indicating that the service quality of the tourism industry is constantly improving. In terms of personalized and intelligent tourism experience, tourist attractions are building a more intelligent and Internet based service platform to provide personalized and customized tourism experience. Many scenic spots use artificial intelligence and other technological means to provide tourists with various convenient services such as guidance, ticket purchasing, voice translation, etc., to improve the quality and convenience of the tourism experience. In terms of ecological environment protection and sustainable development, scenic spots have increased their efforts to protect the ecological environment, established and improved ecological protection systems, and various regions have also begun to promote the concept of green travel and low-carbon tourism, encouraging tourists to use public transportation, and advocating environmentally friendly tourism methods. In terms of integrating tourism with other industries, tourism products in various regions actively combine with cultural and creative industries, sports industries, health and wellness industries, injecting new vitality and innovation into the tourism industry, and enriching the supply of tourism products.

3) Tourism related policies

The government's support and planning for the tourism industry are constantly strengthening. For example, the "14th Five Year Plan" for the development of the tourism industry proposes to accelerate the construction of a strong tourism country, and achieve higher quality, more efficient, more equitable, more sustainable, and safer development of the tourism industry; The "Domestic Tourism Enhancement Plan (2023-2025)" released by the Ministry of Culture and Tourism further promotes

the release of tourism consumption potential and promotes high-quality development of the tourism industry. This plan emphasizes the improvement of the scale and quality of the domestic tourism market, as well as the organic combination of implementing the strategy of expanding domestic demand and deepening supply side structural reform.

Local governments also attach great importance to the development of the tourism industry and have formulated a series of policies to promote its high-quality development. These policies include tourism infrastructure construction, tourism product development, and tourism market promotion. At the same time, strengthen cooperation with surrounding areas, jointly build tourism brands, and enhance overall competitiveness. Local governments also attach importance to the sustainable development of the tourism industry by formulating tourism development plans, strengthening tourism resource protection, and other measures to ensure the long-term development of the tourism industry. They also focus on improving the quality of the tourism industry and innovating services to meet the diverse needs of tourists.

3. Analysis of the Coupling and Coordination Mechanism between Provincial Digital Economy and Tourism Industry

(1) Overview of the Coupling and Coordination Mechanism between Digital Economy and Tourism Industry

The coupling coordination mechanism refers to the process in which two or more systems achieve common development through interaction, correlation, and influence. In the context of the digital economy, the coupling and coordination mechanism between the digital economy and the high-quality development of the tourism industry is manifested in the deep integration, mutual promotion, and common development between the digital economy and the tourism industry.

(2) Analysis of the Coupling and Coordination Relationship between Digital Economy and Tourism Industry

Firstly, the digital economy provides technical support for the tourism industry. The digital economy provides precise marketing, intelligent recommendations, personalized services, and other support for the tourism industry through technologies such as big data, cloud computing, and artificial intelligence, improving the operational efficiency and service quality of the tourism industry.

Secondly, the tourism industry provides application scenarios for the digital economy. As an important component of the service industry, the tourism industry provides rich application scenarios for the digital economy, such as tourism e-commerce, online tourism services, virtual tourism, etc., promoting the innovative development of the digital economy.

Thirdly, the digital economy and tourism industry mutually promote each other. The deep integration of digital economy and tourism industry has promoted the digital transformation and upgrading of tourism industry, improved its competitiveness and sustainable development ability; At the same time, the prosperous development of the tourism industry has also provided new growth points and development momentum for the digital economy.

(3) The significance and value analysis of the coupling and coordination mechanism between digital economy and tourism industry

Firstly, promote the high-quality development of the tourism industry. The coupling and coordinated development of the digital economy and tourism industry can promote the digital transformation and upgrading of the tourism industry, improve the operational efficiency and service quality of the tourism industry, meet the growing diversified and personalized needs of tourists, and promote the high-quality development of the tourism industry.

Secondly, promote innovative development of the digital economy. The prosperous development of the tourism industry can provide new application scenarios and development momentum for the digital economy, promoting innovative development of the digital economy. Meanwhile, the rapid

development of the digital economy can also provide more technological support and innovation space for the tourism industry, promoting its sustainable development.

Thirdly, to assist in the coordinated development of regional economy. The coupling and coordinated development of digital economy and tourism industry can strengthen industrial linkage and cooperation between regions, and promote the coordinated development of regional economy. By building a tourism ecosystem and regional tourism brands, we aim to enhance the overall competitiveness and influence of the region.

(4) The Implementation Path Analysis of the Coupling and Coordination Mechanism between Digital Economy and Tourism Industry

In terms of leading technological innovation, by strengthening the application and research and development of digital technology in the tourism industry, we will promote technological innovation and industrial upgrading in the tourism industry. For example, using big data technology to analyze tourist behavior and provide accurate marketing strategies for tourism enterprises; Utilizing artificial intelligence technology to provide personalized tourism service experiences for tourists.

In terms of policy support and promotion, the government encourages the integrated development of the digital economy and tourism industry by introducing relevant guidance and support policies. For example, increasing support for tourism e-commerce platforms and promoting the digital transformation of the tourism industry; Strengthen the protection and utilization of tourism data resources, and promote the deep integration of tourism industry and digital economy.

In terms of industrial chain collaboration, by strengthening the coordinated development of tourism and digital economy related industries, a complete industrial chain can be formed. For example, promoting cooperation between tourism enterprises, e-commerce platforms, financial institutions, etc., to jointly build a tourism ecosystem; Strengthen the industrial linkage between tourism destinations and surrounding areas, and promote the common development of regional economy.

4. Analysis of the Driving Factors of Digital Economy in Promoting High-Quality Development of Provincial Tourism Industry

The driving factors for the high-quality development of provincial tourism industry supported by the digital economy mainly include technological innovation, digital marketing, smart tourism construction, data-driven decision-making, and so on.

(1) Technological innovation

By innovating and applying technologies such as big data, artificial intelligence, cloud computing, and the Internet of Things, more efficient and accurate service methods have been provided for the tourism industry. For example, mobile payment, online booking, virtual reality (VR), and augmented reality (AR). These technologies have improved the convenience and personalization level of tourism services, and improved the tourist experience. For example, the Longmen Grottoes Smart Cultural Tourism Digital Twin Platform utilizes digital twin technology and spatiotemporal AI technology, fully integrating the scenic area's entire spatiotemporal big data, providing tourists with a panoramic immersive experience. Through this platform, tourists can virtually tour the Longmen Grottoes, understand the historical and cultural background, improve the travel experience, and significantly improve tourist satisfaction. Therefore, technological innovation plays a crucial role in improving the quality of tourism services and management efficiency, and is the core driving force behind the high-quality development of the tourism industry in the digital economy.

(2) Digital marketing

Through the use of digital platforms such as the Internet and social media, the publicity and promotion of tourism products will be carried out to improve the popularity and attractiveness of tourism destinations. Digital marketing can also break through the geographical limitations of traditional marketing and achieve global marketing coverage. In 2023, tourism publicity and promotion activities

in Xi'an, Zibo, Harbin and other cities through social media platforms such as Tiktok and WeChat have attracted a large number of hits and attention, effectively enhancing the popularity and influence of tourism brands in the region. For example, the performance project "Returning to the Prime Minister's Mansion Again" launched by Shanxi Culture and Tourism Group Yunyou Shanxi Company has attracted a large number of tourists through online promotion and promotion. At the same time, combined with offline live performances, it provides tourists with a unique cultural experience and effectively promotes the development of local tourism industry. Digital marketing has played an important role in enhancing the influence of tourism brands and expanding market share, and has a significant driving effect on the development of the tourism industry.

(3) Smart tourism construction

By building a smart tourism platform, digital and intelligent management of tourism resources can be achieved, enhancing the tourism experience of tourists. The smart tourism platform can integrate tourism resources, provide one-stop services, and achieve online and offline interaction, providing tourists with a more convenient and rich tourism experience. At present, various provinces and regions have begun to build smart tourism platforms, and the active exploration and practice in the digital transformation of the tourism industry have also begun to show good results. For example, Heilongjiang Province proposes to build a "provincial tourism network", create a demonstration province of comprehensive smart ecological tourism, and promote the digital and intelligent upgrading of tourism infrastructure. Guizhou Province is actively promoting the construction of "big data+comprehensive smart tourism", with a focus on the construction of the "One Code Tour of Guizhou" service platform, integrating tourism resources, and improving the level of intelligent and convenient tourism consumption. The construction of smart tourism is of great significance in improving the level of tourism services and enhancing tourist satisfaction, and has played a positive role in promoting the high-quality development of the tourism industry.

(4) Data-driven decision-making

By utilizing big data analysis techniques, in-depth research and analysis of the tourism market are conducted to provide scientific and accurate decision-making support for tourism enterprises. For example, predicting the development trend of the tourism market and evaluating the feasibility of tourism projects through data analysis. Currently, some regions have actively implemented the application of big data analysis in the tourism industry, providing personalized products and services for tourism enterprises by analyzing the travel habits and consumption preferences of tourists through big data analysis. There are many cases in this regard. The regional congestion prediction and intelligent command and dispatching system developed by Mount Huangshan Scenic Area has realized the functions of regional congestion prediction, intelligent command and dispatching, dynamic road network planning, etc. under complex terrain, effectively improving the tourist management ability and operating benefits of the scenic area. The tourism department of Zhejiang Province utilizes big data analysis technology to provide personalized travel recommendations for tourists based on their browsing history, purchase records, search keywords, and other information. By analyzing historical data, weather conditions, holiday arrangements, and other factors, the tourism department of Zhejiang Province can predict the tourist flow of various scenic spots and formulate response measures in advance, such as adding temporary parking lots and ticket windows, to ensure the tourist experience. Data driven decision-making has played an important role in optimizing tourism resource allocation and improving decision-making efficiency, providing strong support for the high-quality development of the tourism industry.

(5) Cross border integration and innovation

In the era of digital economy, the integration and innovation of tourism industry with other industries are becoming increasingly frequent. The digital economy has promoted the transformation and upgrading of the cultural and tourism industries through the application of new technologies such as big data, metaverse, and artificial intelligence. The application of digital technology has led to more intersection and integration between the tourism industry and other industries. For example, through

cooperation with e-commerce and payment industries, tourism enterprises can provide convenient services such as online payment and electronic ticketing for tourists; Collaboration with aviation, hotels, catering and other related industries can provide cross industry joint marketing and package services. The development of cloud exhibitions, online live streaming, cloud broadcasting and other services has promoted the integration and innovation of online and offline development, and activated new forms of cultural and tourism industry. For example, since 2023, Internet platforms such as Tiktok, Alibaba, Baidu, etc. have cooperated with local cultural and tourism administrative departments to carry out rural tourism digital promotion actions, and promote the development of rural tourism through three-dimensional display, product marketing, training support, etc., which are combined online and offline. The Pinggu Peach Blossom Festival is one of the successful cases, which utilizes digital technology to enhance the attractiveness and competitiveness of rural tourism. By empowering the development of rural tourism through digital technology, the exploration and promotion of diverse rural values have been achieved, enhancing the experience of tourists and the quality of life of rural residents. This cross-border cooperation not only enriches the types and forms of tourism products, but also enhances the overall competitiveness of the tourism industry. Cross border integration innovation is of great significance in enriching tourism products and expanding the tourism market, injecting new vitality into the high-quality development of the tourism industry.

The degree of assistance provided by each factor varies depending on the specific situation of the region. Overall, factors such as technological innovation, digital marketing, smart tourism construction, data-driven decision-making, and cross-border integration innovation jointly promote the high-quality development of the provincial tourism industry. Among them, technological innovation and digital marketing are important driving factors, playing a key role in the development of the tourism industry. The construction of smart tourism, data-driven decision-making, and cross-border integration innovation have also promoted the high-quality development of the tourism industry to varying degrees.

5. Conclusion and Recommendations

Through research, it has been found that there is a significant coupling and coordination relationship between the provincial digital economy and the tourism industry, and the digital economy plays a driving role in the high-quality development of the tourism industry. To promote the high-quality development of the tourism industry, the following suggestions are proposed:

- (1) The government should strengthen policy support for the coordinated development of the digital economy and tourism industry, formulate scientific and reasonable policy measures, and promote deep integration between the two.
- (2) Increase investment and support for technological innovation, promote the widespread application of new generation information technology in the tourism industry, and improve the intelligence level of tourism services.
- (3) Strengthen regional cooperation and exchanges, promote the coordinated development of digital economy and tourism industry between different provinces, and achieve resource sharing and complementary advantages.
- (4) Strengthen the excavation and inheritance of social culture, combine traditional culture with modern technology, and create tourism products and services with local characteristics.

In summary, both the provincial digital economy and tourism industry are showing a rapid development trend, providing strong support for the growth and transformation and upgrading of the provincial economy. In the future, with the continuous progress of technology and the continuous improvement of policies, the tourism industry is expected to achieve higher quality development.

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