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Retraction

Retracted: Innovation and Digital Construction of Cultural Tourism Industry under the Background of Big Data and Internet of Things

Mobile Information Systems

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] B. Liu, "Innovation and Digital Construction of Cultural Tourism Industry under the Background of Big Data and Internet of Things," *Mobile Information Systems*, vol. 2022, Article ID 9019536, 8 pages, 2022.

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Research Article

Innovation and Digital Construction of Cultural Tourism Industry under the Background of Big Data and Internet of Things

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In recent years, the concept of the Internet of Everything has gradually entered all walks of life, and the combination of big data technology and the Internet of Everything applied to other industries has become the current trend of industrial innovation. The integration between the tourism industry and the cultural industry is an inevitable trend for the sustainable development of the tourism industry. New science and technology are constantly innovating the way of life of human beings. If the tourism industry wants to maintain a state of rapid development, it must focus on the innovative development and digital construction of cultural tourism, develop new cultural tourism products, and propose new marketing innovation models. This promotes faster and better development of the tourism industry. Based on this, this paper designs a questionnaire and uses statistical methods to analyze the data obtained by the questionnaire, summarizes the current problems in the innovation and digital construction of the cultural tourism industry, and proposes solutions in a targeted manner, in order to improve the cultural tourism industry. Healthy development provides incremental contributions.

1. Introduction

1.1. Big Data. Big data, in short, is a collection of massive amounts of data [1]. Big data is often limited to two aspects: on the one hand, it is limited by the cost of data [2]. In order to meet the needs of big data processing, there are not only hardware and software but also labor costs and overlapping time, so it cannot be used without restraint [3]; on the other hand, it is also limited by data processing technology [4]. The fusion of big data and the scope of effective practice depends on the processing of the data of the person responsible for the implementation, which requires both technical and professional knowledge of data processing [5]. The absence of either of these two factors may lead to no value in data processing meaning that these two factors are crucial [6].

1.2. Internet of Things. The development of the Internet of Things provides a new development direction for the progress of enterprises [7–9]. The definition of the Internet of Things is to use radio frequency identification RFID, global positioning system GPS, and other message sensing equipment, according to a certain protocol, to connect any item through the Internet of Things domain name, information exchange, and communication in order to achieve intelligent identification and positioning, A network concept for tracking, monitoring, and management [10–13]. The concept of Internet of Things technology has been prevalent in academia in the 1980s. In recent years, branch applications of Internet of Things technology have gradually entered all walks of life [14].

1.3. Cultural and Tourism Integration Innovation. The integration of culture and tourism not only provides a new way for the optimization and upgrading of culture and tourism in the development process [15] but also provides a new direction for the innovative development of culture and tourism [16]. With the continuous innovation of the tourism industry and the continuous raging of the epidemic, many tourism industries in my country are showing signs of decline [17]. Through the integration of culture and tourism,

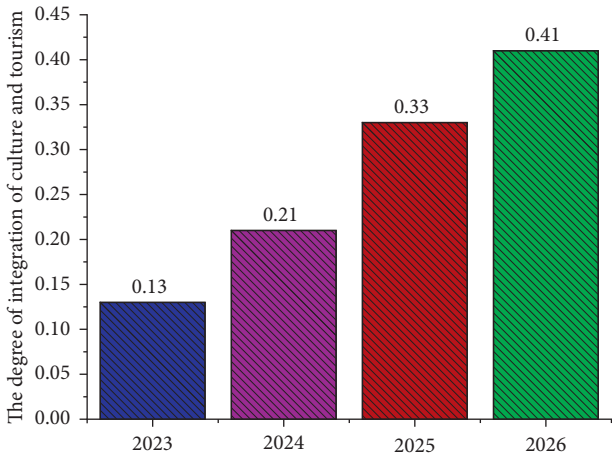

Figure 1: Innovation and development trend of cultural tourism industry.

not only can the red tourism industry continue to develop under the trend of economic globalization, but also a new development direction for my country's tourism industry under the epidemic situation relying on the integration of culture and tourism can better utilize the advantages of these tourism resources to maximum [18].

With the improvement of tourists' living standards, the broadening of their horizons, and the increase of knowledge, tourists are no longer satisfied with simple sightseeing tours and product consumption but pursue more aesthetic experience and feel the cultural connotation carried by tourism products [19–22]. As the crystallization of human civilization and culture and art, national culture reflects the spiritual characteristics of a nation [23]. It contains unique national history and humanistic characteristics [24]. It has played an active role in meeting the cultural needs of tourists [25]. Combined with human civilization and national culture, it will provide tourists with a more immersive experience [26, 27]. Therefore, it is necessary to conform to the trend of the times, dig deep into the characteristic cultural tourism resources, continuously combine various new science and technology, meet the characteristic and multilevel needs of mass tourism, promote the creative transformation and innovative development of national culture in tourism, and promote the cultural tourism industry [28–30]. The development of tourism industry has reached a new level [31]. The innovative development of the cultural tourism industry has become a trend in the future, and the agency predicts its growth rate in the next 4 years as shown in Figure 1.

2. Questionnaire Survey and Analysis

In order to understand the current situation of innovation and digital construction of the cultural tourism industry, this paper conducts an online survey on 50 large-scale tourism enterprises in charge of cultural tourism and technical departments and 1000 tourism enthusiasts through the questionnaire star platform. The content includes the sense of tourist experience, the marketing and publicity efforts of tourism companies on cultural tourism, and the current digital construction of various tourism companies. Through the half-month survey, a total of 2,000 questionnaires were distributed, 1,997 questionnaires were recovered, and 1,996 valid questionnaires were obtained. The effective recovery rate of the questionnaire was close to 100%. In the questionnaire content, the sense of tourists' experience is highly related to the needs of tourism enterprises' cultural and tourism innovation and digital construction. From the perspective of customers, it can also reflect the actual requirements of current industrial innovation. A total of 1,000 tourist questionnaires were distributed and selected three key data are displayed, and the data related to tourists' experience in the survey are shown in Table 1.

From the data in Table 1, it can be seen that under the current cultural and tourism integration background, tourists' recognition of cultural tourism is still at a low level. Tourist A's recognition of tourism under the background of cultural and tourism integration is less than 20%, while the recognition of C tourists is less than 20%. The highest is not more than 30%. The surveyed tourists generally reflect that they cannot deeply experience the cultural scenes and connotations contained in tourist destinations during tourism. It can be seen that the current cultural tourism industry still needs to be innovated according to the needs of tourists.

The marketing and publicity of cultural tourism by tourism enterprises is highly related to the development of the enterprise. The innovation of cultural tourism industry is also gradually developed on the basis of marketing and publicity. This time, the data of three typical tourism enterprises are selected for display, among which the survey involves tourists. The experience data are shown in Table 2.

From Table 2, it can be seen that the current effective marketing of cultural tourism by tourism companies still accounts for a poor proportion of all marketing. Among them, the effective marketing of company A accounts for 29%. Compared with all the marketing costs it pays, the effectiveness is still less than 30%. From the perspective of effective publicity, the effectiveness of corporate C's publicity is the highest, reaching 28%, but the effective publicity of company B is less than 20%. The effectiveness of publicity and marketing of each company still needs to be improved.

The validity and reliability of the questionnaire can only be found in the actual test. Through the theoretical analysis of reliability and validity, the correlation coefficient of the questionnaire in this paper is shown in Table 3.

From Table 3 and the actual questionnaire reliability theory, it can be seen that the data about the tourist experience questionnaire is real and effective, and it is more in line with the actual situation, so it is believed that the survey and analysis results are valid.

The current digital construction of tourism companies is highly related to the innovation of the company and the innovation of the entire industry, and digital construction is also directly related to the experience of tourists. This

Table 1: Tourist experience under the background of cultural and tourism integration.

Tourist code	Experience feedback	Recognition degree
A	No cultural content	0.19
B	Only tourism, no culture	0.21
C	Inability to resonate with the environment	0.25

Table 2: Marketing and promotion of cultural tourism by tourism enterprises.

Tourist code	Marketing effectiveness	Publicity effectiveness
A	0.29	0.25
B	0.27	0.19
C	0.26	0.28

Table 3: Reliability and validity analysis.

	Reliability	Validity
Value	Alpha = 0.81	KMO = 0.79

Table 4: Current digital construction of tourism enterprises.

Tourist code	Application rate of big data	Application rate of IoT	Application rate of other IT systems
A	0.04	0.02	0.19
B	0.03	0.01	0.13
C	0.03	0.01	0.11

Table 5: Reliability and validity analysis.

	Reliability	Validity
Value	Alpha = 0.82	KMO = 0.83

time, three typical tourism companies were selected to display the survey content and data. The details are shown in Table 4.

From the data in Table 4, it can be seen that the digital construction of the three typical tourism companies currently surveyed is relatively poor. Among them, the application rate of big data and the application rate of the Internet of Things can reflect the degree of digital construction of enterprises. In fact, the application rate of big data is the highest. Company A is less than 5%, and the IoT application rate of companies B and C is also maintained at the level of 1%. Although the application rate of other IT systems has reached more than 10%, it is still less than 20%. The overall situation of this data is sufficient. It shows that the digital construction of enterprises is still at a poor level.

Through the theoretical analysis of reliability and validity, the questionnaire correlation coefficient of digital construction is obtained as shown in Table 5.

It can be seen from Table 5 and the actual questionnaire reliability theory that the data of this digital construction questionnaire survey is real and effective, and it is more in line with the actual situation, so it is believed that the survey and analysis results are valid.

In order to analyze the data collected by the questionnaire, this paper uses machine learning related algorithms to process the data, and the formulas involved are shown in (1a)–(1e).

$$\nabla_{\theta^\mu} J \approx \frac{1}{N}\sum_i \left[\nabla_a Q\left(s, a|\theta^Q\right)|_{s=s_i, a=f(s_i)} \nabla_{\theta_f}\mu\left(s|\theta^\mu\right)|_{s=s_i}\right], \tag{1a}$$

$$\eta_{E_H} = \frac{1}{N}\sum_{i=0}^{N} E_{H,i}, \tag{1b}$$

$$\sigma_\zeta^2 = \frac{1}{N}\sum_{i=0}^{N}\left(\zeta_i - \eta_\zeta\right)^2,$$

$$\sigma_{E_H}^2 = \frac{1}{N}\sum_{i=1}^{N}\left(E_{Il,i} - \eta_{E_H}\right)^2, \tag{1c}$$

$$\widehat{b}_t = \frac{b_t}{\lambda_1},$$

$$\widehat{\zeta}_t = \frac{\left(\zeta_t - \eta_\zeta\right)}{\sigma_\zeta}, \tag{1d}$$

$$\widehat{E}_{H,t} = \frac{\left(E_{H,t} - \eta_{E_u}\right)}{\lambda_2 \sigma_{E_H}}. \tag{1e}$$

3. Current Issues of Innovation and Digital Construction of the Cultural Tourism Industry

3.1. Tourists Cannot Experience the Deep Integration of Culture and Tourism. From the statistics of the questionnaire data, it can be found that under the background of the current integration of culture and tourism, tourists still cannot effectively obtain the culture contained in the tourist destination during their travel [32]. For example, a surveyed tourist said that when visiting the Yellow Crane Tower in Wuhan, he did not deeply experience the feeling of historical poets reciting poems in the Yellow Crane Tower, and he could not see a detailed introduction to the scenes of poets writing poems in the Yellow Crane Tower scenic spot [33] affects the experience of tourists [34]. Tourists' recognition of the integrated development of culture and tourism is also low. According to interviews with technical departments of tourism enterprises and professionals related to innovation in the cultural tourism industry, the main reason why tourists cannot experience the deep integration of culture and tourism is the lack of technical assistance [35]. Since tourists are more accustomed to the way of obtaining detailed information on

various scenes in computers and mobile phones in daily life, they will have a poor experience even if they cannot obtain detailed information about the culture at that time in the tourist scene [36]. Therefore, tourism enterprises and industrial planning need to innovate from a technical point of view.

3.2. Insufficient Marketing and Publicity. In the face of the increasing development of cultural tourism, the marketing method of tourism must be changed in order to occupy a high position in the tourism industry [37]. The marketing method of cultural tourism should ultimately focus on culture [38]. Without culture, tourism marketing would be meaningless. The traditional tourism marketing products are mainly tourist attractions, and many tourist attractions will continue to develop new tourist attractions to attract more tourists. The development of new tourist attractions is not a small amount [39]. In the long run, not only will it not attract more tourists, but the investment in the construction of scenic spots will also hinder the development of the local economy [40]. Therefore, in the innovation of tourism marketing methods, enterprises can focus on reflecting the local cultural connotation and carry out the combined marketing of ethnic cultural tourism products. The combination marketing of cultural tourism products not only realizes the integration of resources but also meets the diversified needs of tourists [41]. While focusing on the combination marketing of cultural tourism products, it is necessary to strengthen management and services. Only in this way can tourists be satisfied with the local level, and can truly retain tourists and retain consumption.

According to the analysis of the questionnaire survey, it is found that the current marketing situation is not ideal. In fact, the enterprises do not use advanced network technology and new technology for marketing nor do they design relatively novel marketing plans. In addition, in terms of publicity, tourism companies have failed to make full use of the characteristics of the current self-media era, combined with various new technologies to promote online publicity, and offline publicity also lacks the support of characteristic technologies, but in fact, other industries have deeply integrated promotion of new technologies. For example, real estate companies already have VR viewing functions in their APPs. In fact, the application of VR to the cultural tourism industry will bring tourists a stronger sense of experience, and online tourism methods are also advocated during the epidemic. Tourism companies have not taken such an action.

3.3. The Degree of Digital Construction Is Low and Personalized Recommendation Cannot Be Completed. Personalized recommendation has achieved great success in the field of e-commerce, and the field of short video has also been occupied by personalized recommendation in the past two years. This technology provides key technical support for companies to capture users. The current level of digital construction in various industries is also

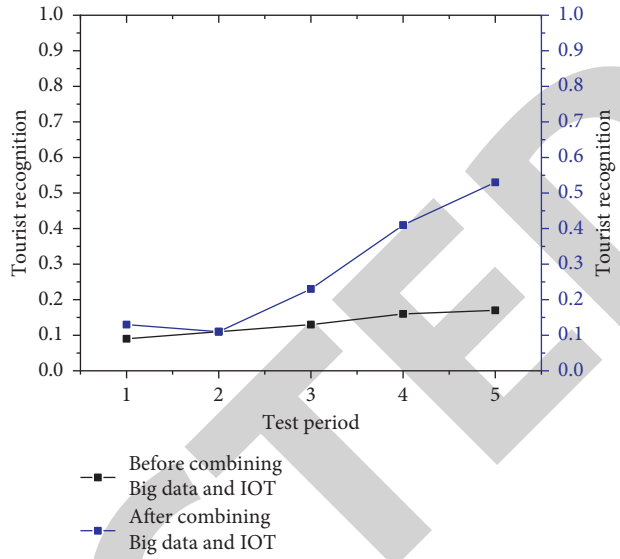

Figure 2: Changes in tourists' recognition of cultural tourism.

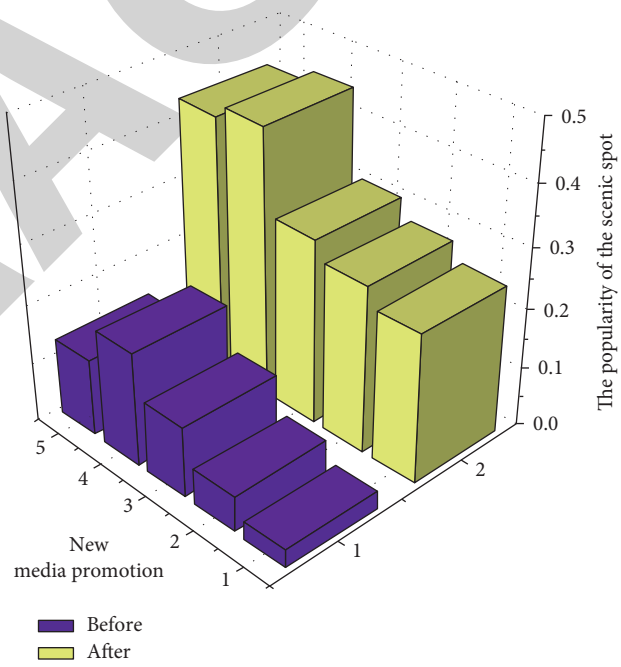

Figure 3: Changes in network popularity of scenic spots.

measured by a technology similar to personalized recommendation. However, tourism companies have not put this technology into practical application. Tourists cannot experience the customized tourism plan in the process of participating in cultural tourism. This is not enough for the cultural experience of the tourist destination, and the final tourist experience is also poor. In addition, the current tourism enterprises do not have enough talent training for big data and Internet of Things technologies, and the application rate of various new technologies is relatively low, resulting in the inability of tourism enterprises to innovate in digital construction.

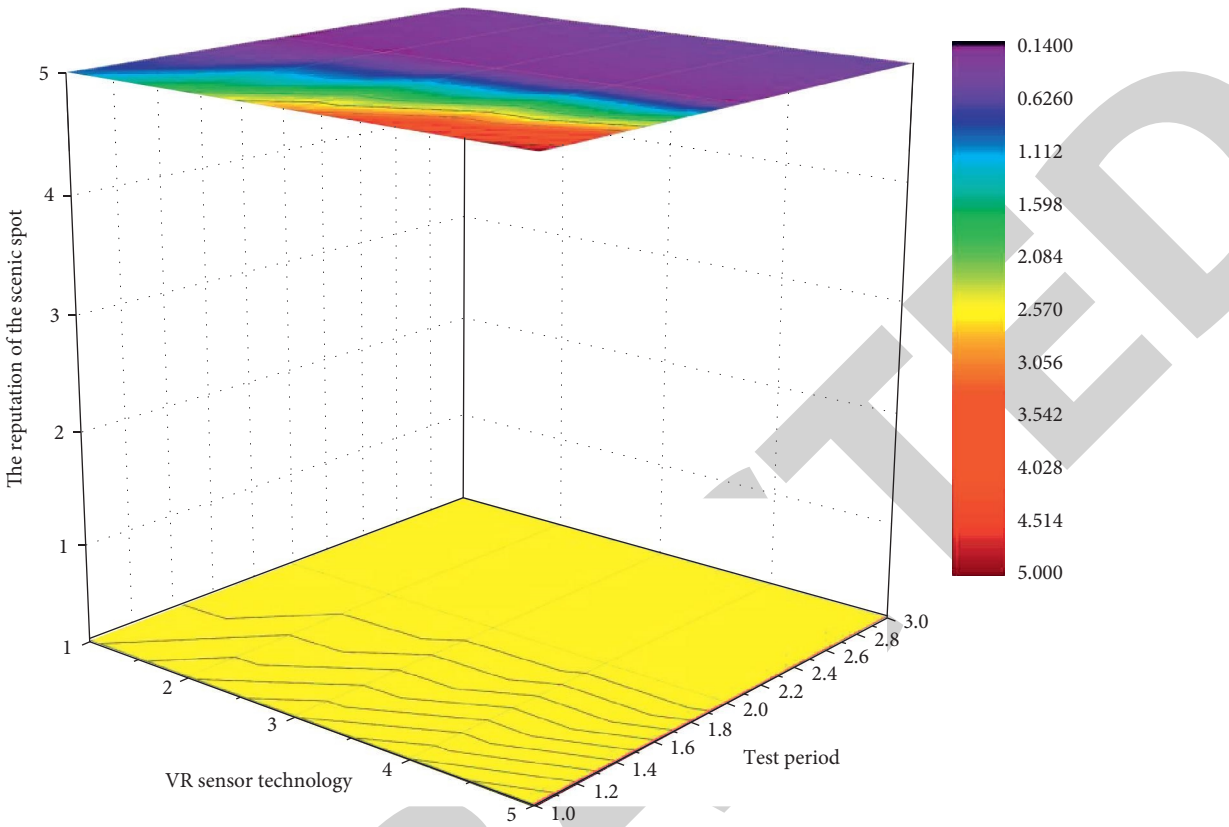

Figure 4: Changes in the reputation of scenic spots.

4. Countermeasures for Cultural Tourism Industry Innovation and Digital Construction Combined with Big Data and Internet of Things Technology

4.1. Combining Big Data and IoT to Provide Tourists with an Immersive Travel Experience. VR technology mainly uses various sensors and some visual technologies to complete the sensory experience of virtual reality, and the sensors are mainly realized by the Internet of Things technology. Big data technology can provide corresponding data for subsequent tourists based on the historical information in the database, combined with the historical operations of other tourists. In response to the problem that tourists cannot experience the actual local culture in the tourist destination, it can be improved by combining big data and IoT sensor technology to provide tourists with specific scenes in specific locations. For example, for the Yellow Crane Tower scenic spot in Wuhan, VR poetry reading equipment can be set up next to the poets' poem recitation positions in the scenic spot, and the combination of VR and sensors can enhance the experience of tourists so that tourists can deeply feel the culture of the scenic spot. Big data can be used to analyze the data of historical tourists using VR equipment and get the most frequently used VR equipment in the scenic area, and add more equipment and some incidental products to the equipment area to ensure the immersive experience of tourists to increase the income of tourism enterprises. Through the secondary investigation of related enterprises, it is found that after the use of big data and Internet of Things technology to improve the experience of tourists, tourists' recognition of cultural tourism has been greatly improved. The specific situation is shown in Figure 2.

4.2. Combining New Technologies to Enhance Marketing and Publicity. In recent years, the influence of new media has been increasing in various industries, and it has also played a huge role in the cultural tourism industry, especially in the stage of tourism promotion and marketing. The current lack of effective marketing and publicity of various enterprises can be solved in steps. First of all, by making full use of the power of the media, traditional media, such as TV advertisements and outdoor advertisements, can be used to preheat the cultural tourism market of enterprises so that the public can have an impression of the scenic spot. You can also introduce live broadcasts through new media platforms such as WeChat public account, Douyin, and Kuaishou to increase the popularity of the scenic spot. In addition, the scheme design is carried out from the perspective of offline publicity and marketing of the scenic spot, and the promotion is carried out in combination with technologies such as VR sensors. For example, VR simulated landscape painting can give tourists a strong sense of visual impact, and various novel tourism activities can also be carried out to stimulate consumers' desire to participate, and through

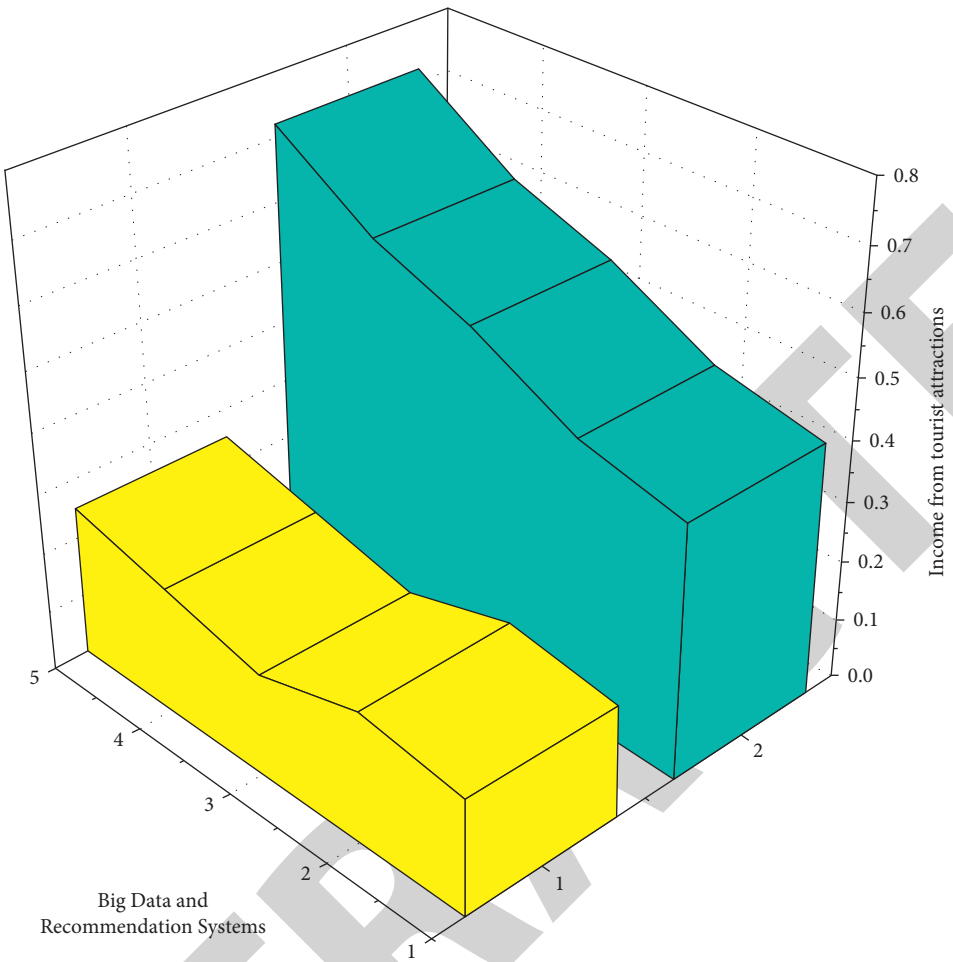

Figure 5: Changes in scenic income after personalized recommendation.

novel and interesting activities, the reputation of the scenic spot in the hearts of tourists can be enhanced. At present, some self-media platforms are not only popular among young people but also widely spread among the elderly, such as Kuaishou and Douyin. Various tourism activities in scenic spots can use these self-media platforms to strengthen publicity and diffusion. Through the secondary investigation of related enterprises, it was found that after adopting new media methods for publicity and marketing, the popularity of the scenic spot has been greatly improved. The specific situation is shown in Figure 3.

Through the secondary investigation of related companies, it was found that after the adoption of VR sensor technology for offline promotion of scenic spots, the changes in the reputation of scenic spots are shown in Figure 4.

4.3. Personalized Service Recommendation Combined with Big Data Technology. Aiming at the low degree of digital construction of the current cultural tourism industry, it can be solved based on the introduction of equipment such as the Internet of Things, combined with big data and recommendation system technology. Only through the objective analysis and calculation of passenger information through big data technology and computer technology can we improve the service model of the tourism industry, formulate personalized services for customers, and realize the perfect integration of resources and services. Among them, big data technology can conduct comprehensive analysis according to the historical data stored in the database, and the recommendation system can recommend the tourists' favorite scenic spot services and content. For homestays, the recommendation system will recommend various homestays to Company A based on the results of big data analysis. Tourists B like to watch dramas in their play history, and the recommendation system will recommend the schedule of cultural dramas related to scenic spots to tourists B to ensure that the income of various projects in the scenic spot will ultimately increase the overall income of the scenic spot. Through the secondary investigation of related enterprises, it is found that after the adoption of big data and recommendation system technology, the income of tourist attractions has been greatly improved. The specific situation is shown in Figure 5.

5. Conclusion

Big data and the Internet of Things are developing rapidly in a fast and irreversible trend. The application of big data has also shown the broad prospects of big data and the Internet

of Things. My country's application of new technologies such as big data and Internet of Things is seen in various industries. The road of policies has been paved, and the continuous development of information technology has also achieved resource sharing and collaborative work. Currently, it has become a trend to apply big data and Internet of Things technologies to various industries. With the popularization of the Internet and smart devices, more and more social networks, the advent of the era of big data is becoming more and more obvious, which will undoubtedly become a new development trend of tourism. With the progress of my country's economy and science and technology, my country's tourism has been significantly developed. The development of tourism resources and the tourist experience of tourists cause bad reflections, most of which are caused by tourists' failure to plan well in advance. Today, with the rapid development of information technology, the technology + industry application model has been widely used in various fields in my country, and the way of cultural publicity should also adapt to the trend so that the culture of various tourist destinations can be promoted faster and more widely on the Internet. The application of the Internet has effectively broken the time and space constraints in the process of information dissemination. The use of Internet-related technologies to promote tourist destinations can not only inherit and expand the culture of tourist destinations but also attract more foreign tourists, thus promoting the deep integration of local cultural tourism industries. Combining big data and Internet of Things technology for publicity and marketing can further improve the popularity and digital construction of the cultural tourism industry and ultimately benefit all tourism companies. By designing a questionnaire survey and using statistical methods to analyze the data obtained from the questionnaire, this paper summarizes the problems existing in the innovation and digital construction of the current cultural tourism industry, mainly including the feeling that tourists cannot experience the deep integration of culture and tourism, and the strength of marketing and publicity. Insufficient and low level of digital construction make it unable to complete personalized recommendation and result in proposing innovative strategies, mainly including combining big data and the Internet of Things to provide tourists with an immersive travel experience, integrating new technologies to enhance marketing and publicity efforts, and combining big data technology for personalized service recommendations, in order to provide incremental contributions to the healthy development and digital construction of the cultural tourism industry.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

Acknowledgments

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