

Research on the Application of Artificial Intelligence Technology in the Construction of Smart Tourism Scenic Spots-Evidence from Nanchong, Sichuan

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Abstract

With the advancement of science and technology, sensing technology and computer communication technology have developed rapidly. As an information-intensive industry, the degree of integration of tourism with various scientific and technological means has been continuously improved in this process. Relatively speaking, smart tourism belongs to a kind of fusion product, that is, a new type of tourism model after the integration of modern tourism and modern technology, and gradually develops and expands to the entire tourism industry. It is changing the business model and management method of the tourism industry. As a hot spot in the development of current high-tech and new technologies, artificial intelligence technology has gradually been widely used in all aspects of social production and life, and has played a good role in promoting the development and improvement of related industries. In the tourism industry, the application and promotion of artificial intelligence technology has laid a scientific and technological foundation for the development of smart tourism. It has been widely used in tourism services, scenic spot management, market forecasting, etc., and has played a role in improving the quality and efficiency of the development of the tourism industry.

Keywords

Artificial intelligence technology, smart scenic spots, smart tourism.

1. Introduction

In recent years, the National Tourism Administration has attached great importance to the work of "smart tourism", and guided the construction of tourist destinations including tourist cities, tourist attractions, tourist hotels, etc. from aspects of smart service, smart management, and smart marketing. Information technology is used to strengthen the development and integration of tourism resources, promote the modernization of tourism service management systems, and create a new engine for the transformation and development of Chinese tourism industry. Foreign research directions and research results generally focus on the application of information technology to tourism, and have accumulated relatively rich research results in tourism informatization. With the rapid development of the information technology industry in China, the continuous maturity of "4G, 5G" and BIM technology has provided sufficient software and hardware guarantees for the development of smart tourism, showing a vigorous development trend as a whole. Therefore, the implementation of artificial intelligence technology for smart tourism information service management research, taking Nanchong City, Sichuan Province as an example, can provide tourists with a new experience brought by "smart tourism" during the whole process of tourism, provide more convenience and safety, improve tourism experience can provide accurate parameters for the government to formulate policy guidance. The government is not only a builder of smart cities, but also a major participant in smart tourism. In the process of formulating relevant regulations and guiding policy

implementation outlines, the government needs accurate parameters. Only in this way can the technical parameters be used as the theoretical basis to ensure the applicability and popularization of the function, and it is also convenient for later replication and refined management.,which provides big data support for enterprises to develop new tourism products. As an enterprise, whether it is online or offline, whether it is developing virtual reality or scenic spots, the quality of the product is determined by the number of customer visits, and the collection of information is one of the core content goals of smart tourism. After processing and analysis, a solution that can meet the market demand can be obtained, so as to achieve the multi-dimensional healthy development of social benefits, economic benefits and even ecological benefits.

2. An Overview of the Basic Theory of Smart Scenic Spots

2.1. Smart Tourism

At present, in the interpretation of the definition of smart tourism, different scholars have different interpretation angles and different opinions. Some scholars believe that the smart tourism model is actually an integration and aggregation of high-tech (cloud computing, Internet of Things, etc.) in tourism resources. Of course, the introduction of information technology in the tourism industry is not just a simple reference, but focuses on integration and penetration to maximize customer satisfaction. The concept of smart tourism in China can be summarized as follows:

Tiewei Ye think smart tourism refers to using new technologies such as cloud computing and the Internet of Things, through the Internet or mobile Internet, and with the help of portable terminal Internet access devices, actively perceive information on tourism resources, economy, activities and tourists and release it in a timely manner, so that people can keep abreast of these information to timely arrange and adjust work and travel plans, so as to achieve intelligent perception of various travel information.

Smart Tourism is a "smart" tourism management platform, using tourism resources across the country, with the help of cloud computing and Internet of Things technology, to achieve intensive, intelligent and unified management of tourism, to improve the country's understanding of tourism, to improve the decision-making ability of decentralized tourism resource management, to expand the service industry field involved in the tourism industry, and take the tourism industry as the leading factor, driving the development of "food, housing, travel, shopping and entertainment" related industries; Various types of sensing devices are laid to sense the ID, attribute, status, location and other information of tourism resources, forming the nerve endings of the smart tourism perception system. The most advanced wireless sensor ad hoc network technology is used to transmit various perception or control information and form the incoming/outgoing neural network of the smart tourism perception system. With the help of GIS technology, information resource integration technology and business intelligence technology is used to integrate various perception information and conduct data analysis to form the brain of the smart tourism perception system.

Smart tourism belongs to a new type of tourism mode. The ultimate purpose is to meet the needs of tourists to the greatest extent, including personalized needs and experiences. In order to achieve this purpose, information technology (cloud computing, Internet of Things and communication technology) play an active role in achieving innovation and breakthroughs in tourism models, creating a better experience platform for tourists, and helping maximize tourism value and improving tourism management.

2.2. Smart Scenic Spot

In China, the smart tourism model has been tried in some scenic spots, and corresponding research results have been obtained. However, in general, many scenic spots are still in the exploratory stage in the implementation of the smart tourism model, and there are relatively few related studies. The definition of smart tourism has not been unified, and the research is relatively lack of theoretical support. At present, scholars' concept of smart scenic spots is generally less in-depth and complete than the concept of smart tourism and smart city, which also reflects that the research on smart scenic spots is in its infancy. The concepts of smart scenic spots are mainly defined as follows:

Some researchers think "Smart Scenic Spot" is an innovative scenic spot management system that can carry out the most thorough perception of the three aspects of environment, society and economy, wider interconnection and more scientific visual management. "Smart Scenic Spot" is based on the major background of the transformation from "Digital Earth" to "Smart Earth", combined with the characteristics of tourist attractions, using the latest achievements of human civilization, building a smart network, and realizing the intelligent development of scenic spots; The latest technological achievements (especially the Internet of Things) are highly integrated and fully applied to the management of scenic spots, so as to more effectively protect tourism resources, provide tourists with better services, and achieve comprehensive, coordinated and sustainable development of the scenic environment, society and economy.

Other researchers think "Smart Scenic Spot" refers to integrating emerging information technologies such as the Internet of Things, ubiquitous network, mobile communication and cloud computing to build a smart network, enhance human perception, and management capabilities, achieve a more refined and dynamic way to manage scenic spots, achieve the "smart" state, and greatly improve the utilization rate of resources and the level of productivity, so as to protect tourism resources more effectively, provide tourists with better services, and realize the comprehensive, coordinated and sustainable development of scenic spots' environmental protection.

In order to meet the all-round needs of tourists (including personalized needs), the scenic spot combines various information technologies (Internet of Things, cloud computing, mobile terminal equipment and artificial intelligence) to provide comprehensive services, enhance the utilization value of the scenic spot, and achieve sustainable development of scenic spots. The essence of smart scenic spots is based on the application of a new generation of information technology in the tourism industry, aiming to meet the needs of tourists, enrich the experience of tourists, and improve the satisfaction of tourists. To achieve the improvement of the management level of the scenic spot, the competitiveness of the scenic spot in the industry has been improved. In essence, there are three main parties responsible for the implementation of smart scenic spots, including the government and enterprises, as well as the management personnel of the scenic spots. The core technologies are the Internet of Things, cloud computing, mobile terminal equipment, artificial intelligence, etc.; the main beneficiaries are tourists and managers of the scenic spot.

3. Common Applications of Artificial Intelligence Technology in Smart Tourism

3.1. Tourist Information Services and Support

In recent years, with the rapid development of social and economic level, people's tourism demand is increasingly strong, tourism has become a new growth point of national economic development, and the development space of tourism industry is vast and huge. At present, the vigorous development of information technology has brought about the exchange and

utilization of massive big data, and tourists have put forward higher requirements for the service quality and level of the tourism industry. The basic principle of tourist-centricity must be implemented. The tourism information system must have the functions of market segmentation, precise marketing, itinerary planning, prediction, and real-time feedback, so that tourists can easily obtain all kinds of effective information they need through the network, so as to help tourists make reasonable predictions and travel decision making.

Taking the tourism market segmentation as an example, due to the obvious phenomenon of "homogenization" of products and services in the tourism industry, tourism companies have been trapped in the marketing strategy of low-price competition for many years, and the innovative development of the tourism industry urgently needs new market concepts and application technology support. In order to make full use of limited resources and provide products and services that meet the needs of tourists, most tourism companies have begun to adopt target-market-oriented marketing strategies, and the basis for determining an effective target market is market segmentation. Tourism market segmentation means that tourism enterprises divide the target tourism market into two or more tourist groups with similar characteristics according to the characteristics of tourists and the differentiation of their tourism needs. In this process, artificial intelligence technologies such as classification, clustering, decision tree and other big data mining are usually used for system simulation and inference decision-making, so that market segmentation is more in line with the actual needs of the tourism market. For tourists, the acquired tourism information services and support are more accurate and practical and for tourism companies, it is more conducive to improving the accuracy and effectiveness of target marketing.

3.2. Safety Management of Tourist Scenic Spot

Safety production is an eternal theme that tourism business enterprises and industry authorities focus on, and it is also an important factor that concerns the life, property and vital interests of every tourist and every tourism practitioner. The application of artificial intelligence technology in smart tourism, especially the realization of image data information recognition based on pattern recognition, such as fingerprint recognition, text recognition, iris recognition, facial recognition, license plate recognition, has been widely used. The video analysis technology can realize the identification of video streams with continuous state characteristics, so as to analyze and judge the characteristics of clustering behavior, and improve the safety management of scenic spots to a new height.

Based on the integrated application of the above-mentioned artificial intelligence technology, the refined operation of the security management of the scenic spot can be realized. For example, the statistics of the number of tourists in the scenic spot can be obtained from the number of people entering the scenic spot or obtained from the access control system of the scenic spot and the video analysis of the exit of the scenic spot. The number of people going in and out of the scenic spot is calculated, so as to accurately control the carrying capacity of the scenic spot, prevent congestion and overload from affecting the experience of tourists. For another example, technologies such as navigation and positioning systems and video analysis can be used to intelligently analyze and predict the speed, direction and other motion characteristics of abnormal phenomena such as smoke in the scenic area, so as to achieve the effect of early warning of fire prevention and disaster prevention. In short, the application of artificial intelligence technology in the safety management of tourist attractions can effectively improve work efficiency, reduce manpower, material resources and capital costs, so as to achieve better management effects.

3.3. Customer Source Forecast

With the improvement of people's income and living standards and the increase of free time, people's travel needs and forms of travel are also increasing day by day, and they are showing

a trend of diversification. Various factors such as tourists' personal preferences, the amount of disposable income, the characteristics of cultural and living backgrounds, make the tourist source areas often show obvious regional characteristics, and the research and application of tourist source forecasting will emerge. Tourism source forecast is an important part of tourism market research, tourism industry planning and tourism industry management. The accuracy of tourism source forecast directly affects the scientificity and effectiveness of tourism research, planning and management.

In the past, traditional quantitative analysis methods were usually used in the forecast of tourist sources, which tended to summarize, organize and analyze statistical data. In recent years, artificial intelligence technology has been widely used in market forecasting of tourist source areas, mainly including rough set method, genetic algorithm, fuzzy time series, artificial neural network, gray system theory. Artificial intelligence technology has obvious advantages in market forecasting. It has good tolerance and adaptability to additional information such as probability distribution of data. Compared with traditional tourism forecasting methods, artificial intelligence technology is applied to tourism source market forecasting and has achieved better predictive performance. For example, Baidu's big data prediction platform can intelligently analyze the search requests of billions of netizens every day, extract a large amount of travel-related data from it, and calculate and analyze the data. By predicting tourist behavior through big data, network users can use the relevant tourism market forecast provided by this technology to understand the popularity of tourists in scenic spots in the future, so as to make reasonable tourism planning and decision-making.

4. Problems in the Construction of "Nanchong Smart Tourism Scenic Spot"

4.1. Smart Services cannot Meet the Needs of the Tourism Market

As we all know, tourism information websites have become an important position for external publicity and communication of "smart scenic spots". However, due to the lack of daily management and maintenance of tourism information websites, many tourism information service websites have problems such as lack of service columns and information lag, and the effect of services is great reduced.

The main attractions in Nanchong City, Sichuan Province are Langzhong Ancient City, Zhang Fei Temple and Zhu De's Hometown. However, Nanchong City currently does not have a dedicated website to introduce the city's tourism information. There are some problems in the management of electronic ticket verification methods for "smart scenic spots" in the city. Some are verified by QR code, and some are verified by ID card, and the verification methods of different purchase channels are not the same, which not only causes a waste of resources in tourist attractions, but also prolongs the time for tourists to enter the scenic area.

With the rise of "smart tourism", the National Tourism Administration requires tourism authorities in various places to combine the actual development of "smart tourism", strengthen the construction of "smart tourism cities" and "smart scenic spots", and strive to build traditional tourism industries into modern services industry. For this reason, as a supporting industry of "smart tourism", tourism hotels urgently need to enhance their attraction to consumers through innovative management concepts and operational methods, so as to meet the development needs of "smart tourism" under the background of informatization.

4.2. The Tourism E-commerce System is not Perfect

With the advent of the information age, e-commerce marketing has a very important impact on the economic development of tourism industry. However, due to the special reasons of tourism products and services, the online marketing methods and means of scenic spot are still relatively simple, and the effect of marketing is also unsatisfactory.

For the public service and management of tourist attractions, e-commerce marketing can be described as a new field, especially in recent years, it has shown extremely strong vitality. Various scenic spots in Nanchong City have also opened official Weibo and WeChat public accounts in keeping with the trend. However, according to the current observation and analysis results, there are the following problems: first, important information is not updated in a timely manner, the quality is not high, it lacks new ideas, and it is difficult to catch the attention of netizens; second, the interaction with netizens is not enough, the degree of participation of netizens is not high, and the number of forwarding and comments is low; third, the management system and mechanism are not smooth, and there is a lack of special personnel to manage it; fourth, e-commerce is lacking of marketing channels.

5. The Application of Artificial Intelligence in the Construction Of "Nanchong Smart Tourism Scenic Spot"

5.1. Intelligent tourism information platform

The competent tourism department is the builder and person in charge of the tourism government website. The main function of the website is to carry out tourism promotion, publish tourism policies and regulations, and handle tourism complaints and suggestions. Tourists can quickly obtain the basic information of scenic spots through the tourism government affairs network, book tourism products and services online, and arrange tourism travel plans reasonably. For the tourism management department, doing a good job in the interaction between the government and the people on the tourism government affairs website is an important means to solve the tourist appeals of tourists and show a good image of the government.

The tourism government affairs website is the premise and foundation of the construction of the tourism information website. Through the tourism information website, tourists can obtain more detailed and rich tourism resources display information. It is necessary to use multimedia methods to comprehensively and intensively display various tourism elements such as "food, housing, transportation, tourism, shopping, and entertainment", so as to stimulate tourists' enthusiasm for tourism consumption. At the same time, when tourists browse a certain content on the website, they should timely and accurately push tourism information related to tourists, stimulate their potential tourism desires and points of interest, turn target tourists into real tourists, and realize tourism products. and precision marketing of tourism services.

5.2. To Upgrade Tourism Audio Commentary System

The tourism interpretation system has a great effect on tourists to better understand the local traffic conditions and humanistic conditions of the scenic spot. In the past, it was difficult for tourists to hear and understand more clearly the way of tour guides in the crowded scenic spots. In this case, the advantages of artificial intelligence are greatly revealed. The artificial intelligence system can explain the characteristics of the scenic spot through mobile phones. While explaining, it can let the tourists have a deeper understanding of the scenic spot through the display of pictures and videos. Artificial intelligence can also set up a self-guided tour mode to select local performances and restaurant types according to tourists' preferences. In this mode, tourists' tours are more personalized and distinctive, and more in line with the needs of different types of tourists.

5.3. Intelligent Planning of Tourist Routes

Baidu map, Gaode map and Tencnet map are software that people often use in real tourism activities. They use the destination search function of map software to find the shortest route to the scenic spot and the most suitable transportation method. However, in the actual tourism process, this method still requires tourists to choose their own routes and means of

transportation. For example, when going to a scenic spot with a moderate distance, taking a bus is the most convenient choice. However, the actual road conditions are not considered by these software. Traffic congestion will make it difficult for the bus to move. Therefore, the option of taking a bus is not realistic. Under the guidance of artificial intelligence, it can combine the actual road conditions and crowd gathering conditions to more intelligently arrange suitable routes, allowing tourists to save a lot of time in transportation.

6. Conclusion

The continuous in-depth application of artificial intelligence technology in smart tourism has brought new development opportunities to the tourism industry. The development, construction and management of tourism enterprises are more flexible and efficient, the tourist experience is more comfortable and convenient, and the management of the tourism industry is more standardized and orderly. The integrated application of artificial intelligence and smart tourism effectively integrates traditional tourism resources and modern information technology, forming a new tourism form and enhancing the development potential of tourism as a sustainable industry. Although there are still some problems that need to be focused on in the current artificial intelligence technology, and there are also some areas that need to be improved, these problems are precisely the inevitable laws of scientific and technological progress and economic development. The application of artificial intelligence technology in smart tourism should continue to pay close attention to hot issues, resolve and prevent possible risks, and further improve the level and quality of scientific and technological services for production and life

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