

Research on Intelligent Tourism Application Based on Big Data

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Abstract. With the development of cloud computing and big data, technology has entered the era of big data, big data mining and intelligent applications are the hot spots of current scientific and technological research. This paper describes the background, features of big data development etc., combines the characteristics of tourism industry, and expounds the connotation of intelligent tourism as well as the demand for intelligent tourism development. Finally, by combining the development of big data and intelligent tourism, this paper analyzes the application of big data in intelligent tourism.

Introduction

In recent years, the technological progress represented by information technology and the innovation of the modern business model will directly promote the transformation and upgrading of the tourism industry. With the development of information technology and knowledge economy, the transformation and promotion of tourism with modern new technology and equipment is becoming a new trend of tourism development in the new era. In this process, science and technology not only create a large number of new tourism formats and new tourism needs, and also guide new tourism consumption. Besides, it has greatly promoted service innovation and business model innovation^[1]. Over the next period of time, information technology will be more widely used in all aspects of tourism development, especially the ongoing implementation of the "integration of three networks", which will promote the information compatibility between different networks, and realize the sharing of cyber source, thus changing the traditional mode of of tourism consumption, tourism operation, and tourism management to a great extent. In addition, the development mode will promote the tourism industry to modern service industry, and also promote the transformation and upgrading of tourism industry^[2-3].

Cloud computing is based on information storage, sharing and data mining technology, which can effectively store these large amount of tourist data, analyze and calculate them, and then dig out more valuable information^[4]. Mining hidden value in tourism data and applying it to intelligent tourism is an important problem for the development of intelligent tourism in China^[5]. The application diagram of cloud computing is as follows:

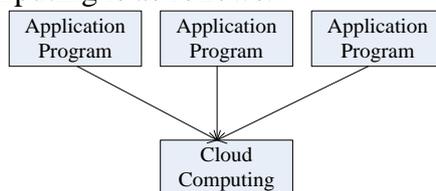


Figure 1. Application Diagram of Cloud Computing

An Overview of Big Data

In recent years, the Internet, cloud computing, mobile and Internet of things have developed rapidly. Ubiquitous mobile devices, the Internet, wireless sensors generate data every minute, and hundreds of millions of users of Internet services are generating huge amounts of interaction all the time^[6-7].

The features of big data:

1) Large amount of data. The initial units of measurement for large data are at least P (1000 T), E (1 million T) or Z (1 billion T). The super size and growth of unstructured data are 10 to 50 times faster than structured data, which is 10 to 50 times as many as traditional data warehouses.

2) Various types. The type of big data includes web logs, audio and video, pictures, location information and so on, which has the characteristics of heterogeneity and diversity, but has no obvious pattern. There is no consistent grammar and sentence meaning and various types of data demand higher data processing power.

3) Low value density. The value density of big data is relatively low. With the wide application of Internet of things, information perception is ubiquitous, and the information is vast, but the value density is low, and there is a lot of irrelevant information. Therefore, it is necessary to carry out predictive analysis of future trends and patterns, and to use machine learning and artificial intelligence so as to analyze the depth and complexity. And it is a difficult problem to be solved in the era of big data that how to achieve the value of data more quickly through a powerful machine algorithm.

4) High speed, and high aging. Fast processing and high timeliness require real-time analysis rather than batch analysis. The data input, processing and analysis, coherent processing are the most distinguished features of big data differentiation from traditional data mining^[8].

Big data applications are shown below:



Figure2. Big Data Application Diagram

Development Needs of Intelligent Tourism

Intelligent tourism is an important part of the construction of smart city. With the rapid rise of smart city construction and rapid improvement of tourism information technology, intelligent tourism construction has been highly valued^[9].

The promotion of intelligent tourism will enhance the service quality of food, shelter, travel, shopping, shopping and entertainment in each tourism consumption link; tourists can easily obtain information, plan travel, book tickets, arrange accommodation, and spend money before, during, and after tourism, which will greatly improve the tourist experience. Based on new generation of information and communication technology (ICT), intelligent tourism integrates Cloud Computing (SaaS, PaaS, IaaS), Internet of thing (RFID technology, sensors etc.), Internet(Web 2.0 technology, integration of three networks technology etc.) and personal mobile terminals (3G technology, PDA, etc.) and artificial intelligence together. Intelligent tourism is the integration design of information communication technology and tourism industry. Different from some applications of information technology in tourism industry, intelligent tourism is the application innovation and integrated innovation of information technology in tourism industry, which aims to meet the individual needs of tourists, provide high-quality and high service satisfaction, and then realize the integration and sharing of tourism resources and social resources, as well as management system reform and effective utilization^[10-11].

Table 1 Development Chart of Intelligent Tourism

2007-2012	Transitional offline tourism
2012-2014	Online and offline tourism
2014-2018	Intelligent tourism

Intelligent Tourism Applications Based on Big Data

Intelligent tourism applications based on big data mainly include three aspects: government-oriented application, enterprise-oriented application and visitor-oriented application.

Table 2 Classification Chart of Intelligent Tourism

Object-oriented	Attribute
Government	Public service type
Enterprise	Business service type
Visitor	Fixed type

Government- Oriented Application

Using big data, the government can not only realize macro control of tourism industry management, but also can master the initiative of public service. For the government itself, it should improve the level of e-government, and establish e-government cluster system; strengthening the cooperation with traffic, weather, customs, and public security departments, and at the same time, putting the internet tourism enterprises, typical tourism investment and individual consumption into the statistical system so as to realize the trans departmental, trans industry and trans regional resource sharing; establishing a large data exchange platform for tourism, and forming a data exchange and sharing mechanism. For enterprises, the government should improve the macro guidance ability, based on large data monitoring platform, it should issue timely and accurate data information about tourism economy, and also improve the ability of guidance information; based on big data technology, it should improve the public opinion monitoring and dynamic analysis of large data, creating a favorable tourism environment for public opinion.

Enterprise-Oriented Application

In the tourism supply chain, food, accommodation, travel, shopping and entertainment these six types of suppliers are been involved. Hotels, airlines, travel agencies and other scenic accommodation travel three suppliers can make full use of big data in intelligent tourism. For these enterprises, the application of big data is mainly presented in two aspects: on the one hand, for the enterprise itself, it implements enterprise management information and internal operations supervision; on the other hand, it carries out marketing campaigns. Enterprises cooperate with operators of major search engines and online travel, carry out full analysis of tourist data mining, and master demand information of tourism consumer, thus providing the basis for the development of tourism marketing strategy.

Visitor-Oriented Application

Tourists are the consumers of tourism products, and they are the core values to realize the intelligent tourism. For most of tourists, consumption information is an important content of big data in intelligent tourism. Relying on the analysis of big data technology, more products which are suitable for tourist will be developed. Therefore, tourism data produced by tourists, and serve the tourists. When we come to a strange scenic for tourism, before the travel, we can collect information in the search engine, and experience virtual tourism; second, we should decide the tourist destination and download the APP; third, we can order tickets or real-time payment. During the travel, first, we will receive QR code in mobile phone; second, we can use intelligent transportation for route planning; third, brushing dimensional code and entering into the area; fourth, we can use APP and follow voice navigation; fifth, when encountering emergencies, we can ask for help; sixth, checking the surrounding about food, shopping and so on, and then using dimensional code to complete the consumption. After traveling, first, we will share the feeling and experience in the scenic spot; second, we can review and share the traveling experience

Conclusion

At present, the application of big data in intelligent tourism mainly presents big data applications of online travel companies. With the development of social economy, the degree of dependence on the data and information resources are increasing, and the tourism industry of big data technology and big data applications are more and more paid attention. This paper expounds the characteristics and background of big data, combined with the characteristics of the tourism industry, it also analyses the application of big data in intelligent tourism.

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