Research on the Integrated Development Model of Rural Tourism and E-commerce Under the Background of Big Data

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Abstract. The combination of e-commerce and tourism has played a great role in promoting the overall development of tourism, improving the tourist experience and improving the tertiary industry of tourism destination. Based on the research background and basis of tourism e-commerce, this paper puts forward the development mode of "rural tourism + e-commerce". In addition, this paper also constructs the basic system of the comprehensive application of rural tourism e-commerce, which can provide reference for the decision-making of rural tourism related departments and the increase of farmers' income.

Keywords: Rural tourism · E-commerce · Application system

1 Introduction

Since the 1980s, tourism has gradually become an important pillar industry in China. In 2019, there will be 6.01 billion domestic tourists and 5725.1 billion yuan of domestic tourism revenue. While the overall tourism industry is booming, the number of rural tourists is also increasing. In the first half of 2019, the total number of rural tourists has exceeded 1.5 billion. In recent years, with the requirements of the policy and the continuous improvement of the infrastructure in rural areas, the share of rural tourism in China's tourism industry is gradually becoming heavy, and it has become one of the focuses of China's tourism development. Rural tourism is rich in content, products and highly inclusive. The integration of "rural tourism + e-commerce" is a new mode of integrated development. Through the integration of rural tourism resources in different regions, the accurate connection between destination resources and market can be realized, and the economic structure of rural tourism can be optimized by seizing the opportunities brought by e-commerce. The establishment of Huaxia tourism network marks the rise of tourism e-commerce in China, and then such websites in China have entered a stage of rapid development [1]. Yan Li and other scholars believe that the rapid development of rural tourism in China is due to the rapid development of urbanization, the increase of urban population density, and the increasingly serious environmental pollution. Zhang yugai and LAN Guiqiu believe that the development of rural tourism must build an information platform to meet the needs of different tourists and consumers.

In addition, foreign scholar Williams thought in 1993 that the combination of information technology and tourism will become an inevitable trend. Now, this research result has been well proved that the e-commerce industry chain of rural tourism with farmhouse as the core has been quite mature [2]. The Fig. 1 shows the e-commerce platform architecture.
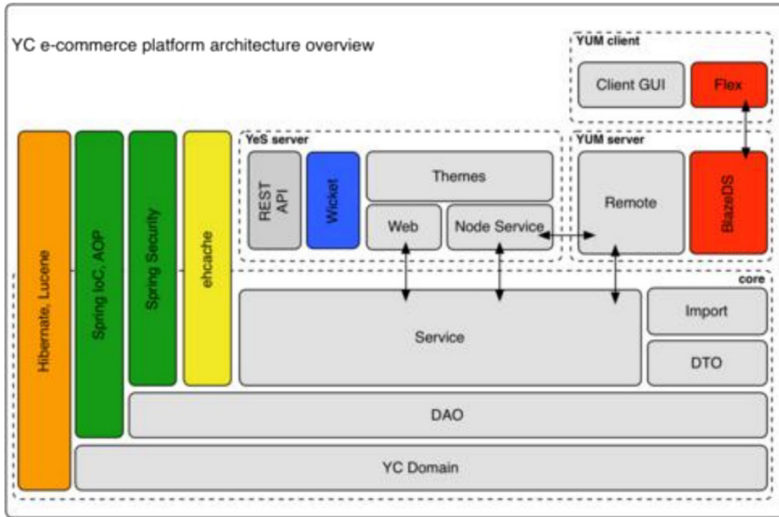

Fig. 1. The e-commerce platform architecture

2 The Importance of "Tourism E-commerce+" in the Integration of Rural Tourism and Targeted Poverty Alleviation

2.1 It is Helpful to Realize the Deep Promotion of Rural Tourism

In terms of the development of rural tourism, although its scale and scope are gradually increasing, its main tourism brand is not outstanding, and it does not have sufficient influence. People have many shortcomings in their understanding, and it is the main problem faced by the current rural tourism work that it does not give full play to the publicity effect. Rural tourism is a key project to promote local targeted poverty alleviation, but because of the weak promotion and publicity, it is still a gap with the target of targeted poverty alleviation. Although tourism resources are very high-quality, they are hidden in the areas where the traffic is not convenient [3]. These resources can bring sufficient impetus to the local economic development. If we want to promote the development of local targeted poverty alleviation through rural tourism, tourists are absolutely essential factors. Without tourists visiting the current tourism area, the economic development will inevitably be greatly impacted, and targeted poverty alleviation cannot be realized naturally. Only by means of Internet can tourism resources and brand products exist

in rural areas be transmitted to the outside world and attract more people to travel. As a new mode of e-commerce work in the new era, tourism e-commerce+, which is not only limited to building a complete product line on the network, but also can promote the current rural tourism resources through the network, and effectively strengthen the visibility of the current rural tourism area. It is not only helpful to sell all kinds of brand products, but also can create a more rapid and complete platform with higher quality, which is an important content of promoting the marketing of ecotourism [4].

2.2 It Helps to Realize the Deep Marketing of Rural Tourism

In the process of building rural tourism system, the folk workshops such as oil workshop and tofu workshop opened by old crafts are not only the visiting places of traditional folk arts and crafts, but also the processing places of various products. In this process [5], it is necessary to recruit and accurately help poor people participate in the production work before, and help them get rid of poverty, Using the technology of "tourism e-commerce+" to promote these products and various agricultural and sideline products such as poultry and pork raised by the poor people to the outside world, effectively reduce the problems in the process of sales. This can not only promote local characteristic products, but also attract corresponding manufacturers to invest or purchase in the current region by means of network system. At the same time, they can also be sold to all parts of the country by means of network, and comprehensively strengthen the reputation of local products and effectively open the current product sales market. In the process of rural tourism management, all kinds of tourism services can be released to the corresponding e-commerce platform and sold. This can not only facilitate the corresponding tourists, but also comprehensively improve the current service level and effectively achieve the important goal of targeted poverty alleviation [6–8].

3 Suggestions on Integration of Rural Tourism and Targeted Poverty Alleviation Under the Background of "Tourism E-commerce+"

3.1 Change the Existing Misconception, and Promote the Deep Combination of Rural Tourism and Targeted Poverty Alleviation

Under the guidance of the information age, the basic state of rural tourism and targeted poverty alleviation work needs to be fundamentally changed. The role of e-commerce in rural tourism publicity is not underestimated, which is an important impetus to integrate rural tourism and targeted poverty alleviation. Under the important goal of targeted poverty alleviation, the importance of "tourism e-commerce+" in rural tourism must be changed by both the government and the individual, and their understanding should be improved in an all-round way, and the important role of correctly applying "tourism electronic commerce+" technology in the current situation must not be separated from rural tourism and targeted poverty alleviation, Instead, we should integrate the three together and promote the current rural tourism content with the help of "tourism e-commerce+" to help the local targeted poverty alleviation. We should take the targeted poverty alleviation as the ultimate goal of rural tourism work, and "tourism e-commerce+" is a new

development means. In order to make rural areas have prosperous tourism industry, and then obtain high economic benefits and effectively get rid of poverty, at the same time, it is necessary to introduce the important technology of "tourism e-commerce+" to guide the participation of the masses of poor farmers and provide corresponding employment channels for them [9].

3.2 "Tourism E-commerce+" Should Play "Experience Card" Widely in Rural Tourism Work

In the context of "tourism e-commerce+", if we want to promote the handover of local tourism and targeted poverty alleviation in an all-round way, so that the two can be integrated, we must play "experience card" widely [10]. Specifically, in the process of basic development, we should correctly apply the characteristics of "Tourism e-commerce+", Through the new mode of online experience and offline experience integration, the influence of rural tourism work is expanded, more public will be attracted to travel, driving the sustainable development of local economy, and ensuring that rural areas can get rid of the poverty problems existing in the current place by the strength of "experience card" [11]. Online travel experience must fully show attractiveness, through the third party e-commerce platform or build its own marketing platform, and display local tourism specific products with the help of video, text and pictures. At the same time, WeChat official account and micro-blog can also be set up to display local characteristics for foreign tourists in the Internet. If the conditions permit, then you can add corresponding VR video to more vividly present the tourism color of local solitary residence, strengthen online experience activities in an all-round way, and expand the local influence. After online experience is completed, tourists will go to rural tourist sites to experience offline, so that the goal of targeted poverty alleviation will be achieved. Of course, in order to guarantee the long-term development of the current tourism economy, tourists must be given sufficient sense of access when performing offline services, let tourists feel the visit by themselves, and strengthen the tourists' trust in all aspects. In this process, online experience needs to focus on attracting tourists' attention and make them have a full sense of identity and exploration [12]. Then, it is to deepen the tourists' memory by offline experience, so that they can feel the actual tourism experience without violation, and then help to cultivate their love for rural tourism resources [13].

4   Data Mining Technology

4.1   Basic Concepts of Data Mining

Data mining is also known as knowledge discovery in database. It aims to build a descriptive or predictive model, and discover the knowledge and hidden patterns or trends by processing a large number of data. The popular understanding is that data mining can help users solve practical problems and make correct decisions and judgments by extracting useful information from a large number of data. The explosive growth of data volume is the fundamental reason for the emergence of data mining technology [5]. At the same time, data mining is widely used in a variety of fields, especially in

finance, industry, risk management and analysis, and telecommunications. For example, in the data analysis process of IDS, data mining technology can be introduced to find valuable information in a large number of security audit data, and then use these valuable information to achieve higher accuracy and detection rate. The main steps of data mining are shown in Fig. 2 below:
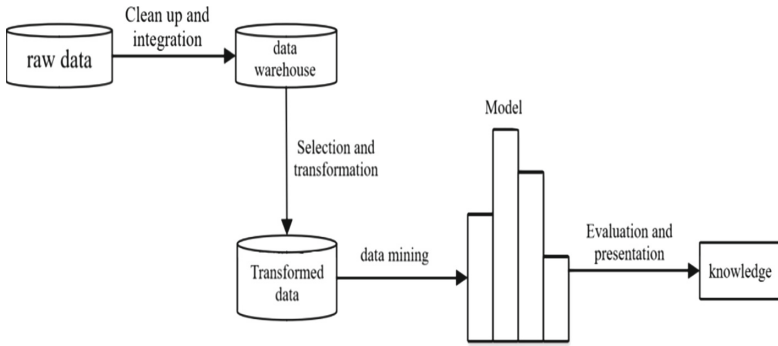

Fig. 2. Shows the main steps of data mining

5   Application of Data Mining Technology in Intrusion Detection

In the process of intrusion detection, data mining technology is very good at mining hidden and valuable information and knowledge from a large number of security audit data, and then build the acquired knowledge into an understandable rule set or pattern, Finally, the constructed rules or patterns are used to efficiently detect whether there are activities violating security policies or suspicious attacks in the network data [14].

Association rule is a kind of technology which aims to find out relevant data items from a large number of data. Association rules are usually divided into two steps to find the relationship between data items. The first step is to find all frequent itemsets that meet the minimum support threshold. The role of the second step is usually more critical than the first step, that is, to transform the discovered item sets into association rules that meet the confidence threshold requirements. However, it needs huge computing resources when facing large data sets. On the basis of unsupervised learning, association rules can be expressed by "if-then" model. At the same time, apron and RP growth algorithms in association rule technology are widely used in recommendation system and intrusion detection [15]. When only using the traditional association rule technology to detect whether there are suspicious activities or behaviors in large-scale network data, it will mistakenly regard the discovered item set as equally important performance and consume a lot of time and resources. Therefore, in view of the shortcomings of the traditional association rule technology, it needs to make effective improvements before it can be used to detect attacks in the network [16].

6 Research on Fuzzy C-means Algorithm

At present, clustering analysis plays an important role in intrusion detection, because it can not only detect new attacks, but also provide high-quality data sets as a preprocessing technology. Therefore, this chapter focuses on the principle of fuzzy c-means algorithm, proposes the weighted Euclidean distance and uses the density method to select a good initial clustering center, and finally verifies whether the improved algorithm achieves the desired effect [17].

6.1 The Principle of Fuzzy C-means Algorithm

The objective function of FCM algorithm is as follows:

$$\min J(U, V) = \sum_{i=1}^{c} \sum_{j=1}^{n} u_{ij}^{m} \left\| x_j - v_i \right\|^2 \tag{1}$$

$$s.t. \sum_{i=1}^{c} u_{ij} = 1, 1 \leq j \leq n \tag{2}$$

In Formula 1 and 2, m is called fuzzy weighted index.

6.2 Improvement of Fuzzy C-means Algorithm

The process of clustering analysis is divided according to the dissimilarity of each data, so choosing a reasonable measurement standard will have a great impact on the good or bad clustering results. Generally speaking, the traditional clustering algorithm uses the distance in the feature space as a metric to calculate the dissimilarity between different data. When distance is used as dissimilarity measurement, the smaller the distance between data, the more similar they are and the more likely they are to be divided into the same cluster; the larger the distance between data, the greater the difference between them and the less likely they are to be divided into the same cluster [18–20].

7 The Integration Development Strategy of Rural Tourism and E-commerce in China

7.1 Analysis of the Problems in the Integration of Rural Tourism and E-commerce in China

As a new model, "rural tourism + e-commerce" has a series of known and unknown problems, such as: difficult quality standard certification, lagging development of cold chain logistics system, imperfect logistics distribution system, lack of management in all aspects of production and distribution, inaccurate marketing channels, fierce competition of homogeneous products, etc. The development of "rural tourism + e-commerce" integration mode not only needs the support of government policies and enterprises' practical actions, but also needs to establish a perfect system, strictly manage every production and service link and attract capital investment. At the same time, we need to build e-commerce platform, strengthen personnel training, speed up infrastructure construction, and use the Internet to form integrated marketing publicity [21].

7.2 Simulation for Rural Tourism and E-commerce in China

The government can introduce a series of targeted policies and plans according to the local situation and referring to the relevant national, provincial and local policies and plans, as the policy guarantee for the development of "rural tourism + e-commerce" mode [6, 22].

Rural tourism has a vast territory. In order to integrate with e-commerce, professional promotion and operation teams are needed to settle in the countryside, collect merchant information (rural B & B, farmhouse [23], restaurants, entertainment places, etc.) and carry out later operation and maintenance. The mode of enterprises helping rural areas can reduce the financial pressure of local government, quickly open up local marketing channels, form multi advantages and mutual resource sharing, and form a virtuous circle of "rural tourism + e-commerce" development. The simulation results are shown in Fig. 3 and Fig. 4.
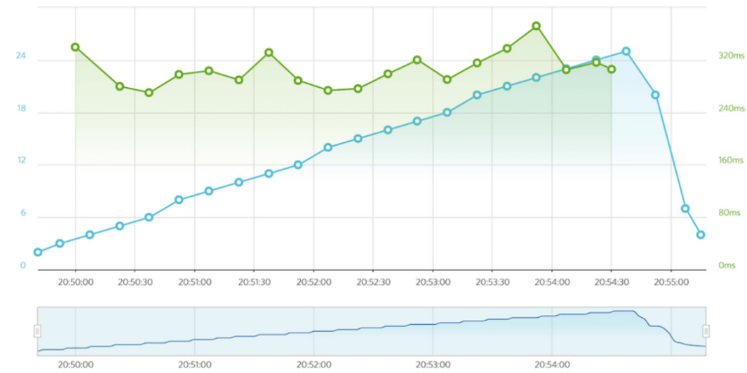

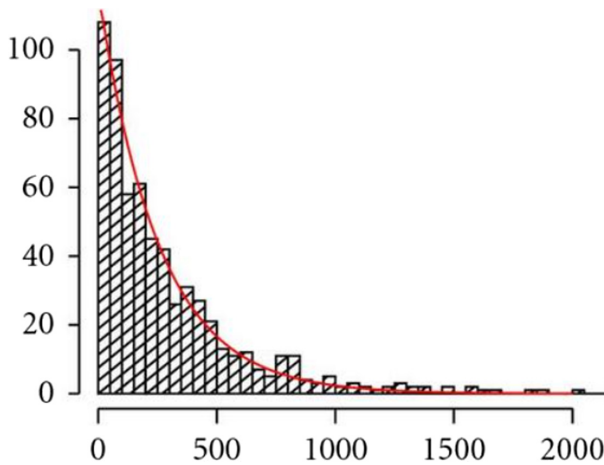**Fig. 3.** Number of concurrent users

Fig. 4. User attention

The establishment of rural tourism e-commerce platform provides a large number of diversified information services for rural tourism industrialization, and provides timely and accurate practical information of rural tourism industrialization resources, market, production, policies and regulations, relevant technical personnel, disaster prevention and mitigation for rural tourism producers, operators and managers. At the same time, it provides online trading platform for enterprises and villagers, Reduce the threshold for enterprises and villagers to engage in e-commerce, cultivate and support rural e-commerce enterprises [24].

8   Conclusion

Based on the perspective of the integration of rural tourism and e-commerce, this paper combs and summarizes the development status of this mode at home and abroad, and summarizes the problems existing in the integration of rural tourism and e-commerce in China by comparing with the excellent cases of foreign rural e-commerce, and discusses the constraints and development strategies. It is found that the basic driving force to promote the integration of rural tourism and e-commerce is the rapid development of China's economy and the increasingly rich tourism resources, and the core driving force is the increasing market demand and the continuous improvement of information technology. However, there are still some restrictive factors in the integration of rural tourism and e-commerce, such as weak foundation, lack of system, lack of talents and funds.

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