

Design of the cultural tourism industry integrity management app system based on blockchain technology

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Abstract: This text describes a blockchain-based integrity management application system architecture for the cultural tourism industry. The system is divided into three layers: alliance chain technology basic services, data sources, and network applications. The alliance chain consists of public chains, private chains, and interactive nodes, each serving different information processing purposes, such as public evaluations and tourism regulation. The data source layer utilizes existing industry regulatory data, recording information related to tourism companies, employees, residents, and tourists. The network application layer implements effective integrity management through the use of credit products and property rights reports, employing rewards, incentives, and joint punishments. Simulations with SimBlock show that, although the application of blockchain technology in tourism is still in its early stages, its value will gradually become apparent. Future research is needed to explore how to maximize the immutability and reliability of blockchain technology.

Keywords: Blockchain; Integrity Tourism; Tamper-proof

1. Introduction

In China, tourism is one of the emerging industries, and among the many tourism products, integrity tourism is one of the top priorities. However, due to the imperfection of the laws and regulations on integrity at this stage, as well as the current situation and characteristics of some industries in the tourism industry, the lack of integrity has led to the problem of lack of integrity. At present, there is a crisis of integrity in many travel agencies and scenic spots in China. For example, some tour guides reduce their requirements in order to improve their performance, some buy air tickets with the cash of tourists shopping, and some tour guides use the comparison psychology of consumers to obtain benefits through deception, which are irresponsible performances. Some even appear maliciously defrauding money, and some unscrupulous merchants promise customers for various reasons that the goods must be bought enough, or charge customers a certain deposit, which is not uncommon. For the above untrustworthy incidents, we can see that although the government and regulatory departments have taken many measures, they still have not fundamentally solved this problem. Therefore, the main research in this paper is how to deal with the current integrity problem, first analyze the untrustworthy behavior of individuals, and then from the perspective of the whole society, and then propose corresponding countermeasures based on blockchain technology to solve the problem.

2. An overview of integrity issues in the tourism industry

2.1 The publicity is not sound enough

How to let more people understand the importance and practicality of e-commerce's integrity tourism app has become one of the focuses of everyone's attention.

2.2 Tourism service facilities are not perfect

At present, the construction of integrity tourism in China is still in the preliminary stage, and there

are still some problems in the integrity tourism service in many places. First of all, the service quality of many tourist attractions in the country at present does not meet the requirements of tourists; Secondly, due to the opacity of information, a large number of false propaganda has been led, which is also one of the reasons for the low integrity; Third, there is insufficient understanding of the concept of integrity, which also affects the consumer experience. From the above analysis, it can be seen that although in the process of tourism, people will choose the corresponding products and services according to different needs, the sharing and complexity of these resources make it difficult for us to fully understand and study them. This is precisely the case in today's booming tourism industry, and how to combine the interests of individuals with the benefits of the whole society to promote economic development has become a topic worthy of in-depth study. To solve this problem, it is necessary to have a complete system to support, so a perfect credit mechanism is particularly important. Therefore, based on the blockchain, this paper designs a blockchain-based credibility assessment app based on the relevant literature at home and abroad and combines the actual situation, and uses examples to verify the feasibility and effectiveness of the system.

2.3 The integrity of unfair competition in the tourism industry is clear

Since the development of China's tourism industry, there is a phenomenon of unfair competition in many places: some travel agencies have not fully considered the needs of tourists in the design and planning of tourism routes; Some scenic spots blindly follow the trend in the construction process, resulting in a waste of resources; There are also some attractions that are not developed reasonably, resulting in environmental damage and so on. These improper behaviors will damage the interests and safety of consumers, and even affect the sustainable, healthy and stable operation of the entire tourism industry and the long-term development of sustainability. At present, many domestic tourist attractions are still in a state of non-standardization, and some tourists do not hesitate to sacrifice the lives of others at the expense of more economic benefits in order to obtain more economic benefits, which is not only a form of illegality, but also a contempt for laws and regulations. Therefore, the promotion of honest tourism apps needs the strong support of the government, and at the same time, it is necessary to strengthen supervision and make it more rational and legal.

2.4 There is price gouging in the travel industry

Due to the characteristics of tourism products, tourists will have a certain binding force on them in the process of consumption, so in the process of tourism. There will be some dishonest behavior, such as: "black car", "hacker", etc.

2.5 Blockchain trends

The core values of blockchain technology are now widely recognized, and the required technology and related technical frameworks are maturing. General Secretary pointed out at the 18th collective learning meeting held in 2019 that blockchain technology has involved all walks of life in society, and it is necessary to aim at the direction of development, seize the opportunity for change, vigorously promote technological development and promote economic and social integration [1-2]. With the continuous exploration and exploration of all walks of life, targeted solutions combined with cutting-edge technologies such as the Internet of Things emerge in an endless stream, and more construction models will emerge in the future to adapt to different industries and achieve rapid development [3]. Blockchain is essentially a database, which has the characteristics of decentralization, integrating many Internet technologies such as distributed data storage [4], Emerging smart contract systems over decentralized cryptocurrencies allow mutually distrustful parties to transact safely without trusted third parties[5]. Blockchain can be popularly understood as a bookkeeping book, unlike the past when all accounts were stacked in the same book, blockchain is a decentralized ledger, scattered in various areas of the Internet, any host under the Internet can manage a certain amount of information. These scattered nodes are linearly connected according to the generation time of each management node. As long as one of the nodes is functional, then the blockchain is secure. This makes it difficult to falsify and tamper with data, and the recording of data is more accurate and reliable, which greatly solves the problem of information distrust. As an industrial form closely related to digital technology, the cultural tourism industry is also quietly changing in this case.

3. System scheme design of cultural tourism industry integrity management app based on blockchain technology

This paper designs the system architecture design of the cultural tourism industry integrity app based on blockchain technology. The system is divided into three layers, namely, alliance technology basic services, data sources and network applications, as shown in Figure 1.

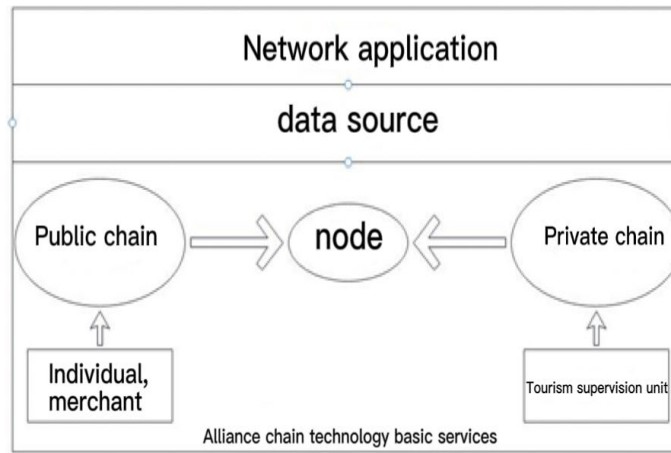


Figure 1: The architecture of the cultural tourism industry integrity app based on blockchain technology

3.1 Alliance chain technology basic services

The basic services of alliance chain technology are divided into public chain, private chain and a node for interaction. Their functions are as follows: the public chain, generally used for individuals and merchants, is a public block, and its information is transparent and public without involving privacy. For example, the evaluation of users, the star rating of merchants, and the evaluation and communication between merchants and users should be made public. The private chain is generally used by tourism supervision units. If there is a certain dispute about the variables in the public chain, then at this time, the private chain will intervene through the central interaction node, and the private chain will judge the public chain. Because the data of the private chain can not be tampered with and is backed up safely, fairness and reliability can be guaranteed. At the application layer, the app makes full use of the characteristics of decentralization to accurately and efficiently generate property rights reports and credit products, and uses this as the basis for integrity management, with a series of reward and punishment measures, to build a good management ecology and achieve scientific management. In order to protect the legitimate rights and interests of businesses and ensure that the cultural tourism industry can thoroughly and quickly rectify the problem of creditworthiness, the cultural tourism industry management department has issued a series of standards to unify and standardize credit judgments, reward customization, incentive policies, and punishment methods. The construction principle is simply explained through the credit reward module. The main audience of the credit reward module is the large and small cultural tourism enterprises in the industry, the employees of the cultural tourism industry, the local residents of the tourist destinations and the tourists who come to travel. Local residents provide tourists with a good tourism environment and services, cultural tourism enterprises and employees provide tourists with convenient and fast guides, scenic spots and cultural tourism enterprises provide preferential treatment for tourists, through excellent services, let tourists evaluate through the tourism app, in order to redeem credit rewards and establish two-way dependence. Credit points will be used as an important basis for supervision, and entities with fewer points need to repair credit points by adjusting services and business methods. Reject malicious evaluation or travel agencies to avoid being eliminated by the market, under the mechanism of credit rewards, only by jointly creating a good atmosphere will we go to a win-win road.

3.2 Data source

On the one hand, the data source makes full use of the existing industry regulatory achievements, on

the other hand, it is easy to control the data volume of the integrity management app. According to the classification of regulatory authorities and functions, the app sets the transmission information options through the regulatory information data of the cultural and Tourism Quality Supervision Department, social credit platforms and the management systems of relevant departments, so as to selectively transmit the information data related to the integrity supervision of the cultural and tourism industry, such as the "blacklist", "white list" tourist Credit Points "and" uncivilized tourist records "of the cultural and tourism department, Realize regular and automatic uploading to the alliance chain technology basic service. The data source is used to record user data. It is the main source of data for the integrity management app of the cultural tourism industry. The relevant participants include tourists, cultural tourism enterprises, cultural tourism staff, cultural tourism residents, etc. The data of cultural tourism enterprises include all forms of information formed by the consumption process, after-sales evaluation, and after-sales return between cultural tourism enterprises and cultural tourism staff, cultural tourism residents and tourists, as well as between cultural tourism enterprises and tourists. The data of cultural tourism staff include services, evaluation of cultural tourism enterprises, evaluation of tourists and other information; Tourist data includes products, services, prices, demands, travel process, tour process, consumption process and other information; The data of local residents include service attitude, food satisfaction and other information. This information is the main source of app data for integrity management of the cultural tourism industry. On the blockchain network, through asymmetric encryption and hashing algorithms in cryptography, consensus algorithms are used among nodes to maintain the consistency of data layer data. The data of the blockchain is equivalent to a database that can not be tampered with and has distributed characteristics.

3.3 Network application

The integrity management app relies on the output of credit products and property rights reports, and takes credit rewards, innovation incentives and joint punishment as means to achieve the goal of effective integrity management. The application layer provides a variety of products such as credit data query, credit score, credit file, credit report, property right report, etc. in a decentralized manner. The cultural and tourism industry management department uniformly issues standards such as credit, reward, innovation incentive, joint punishment, etc., so as to timely and effectively manage the integrity problems of the cultural and tourism industry, and prevent bad businesses from having dishonest behaviors or.

Taking credit incentives as an example, cultural tourism enterprises, cultural tourism staff, tourists, local residents and other participants are the main participants. These entities can obtain credit points through high praise from tourists and high-quality services from local residents. Credit points are used as industry supervision. Tourists rely on cultural and tourism enterprises and tourists' access to tourism concessions. Exchange credit rewards since. As for tourist attractions, tourist attractions allow tourists to evaluate through tourism apps through excellent services, and the scenic spots can obtain corresponding credit points, so that more tourists can better and more rationally choose tourist attractions. For tourists and travel agencies with low credit scores, they need to improve their credit scores and refuse malicious evaluation or travel agencies to avoid being eliminated by the market. Under the credit reward mechanism, only by jointly creating a good atmosphere can they move towards a win-win path.

3.4 Simulation results

Simblock is a simulator developed by a team at Tokyo Institute of Technology that allows anyone to experiment with blockchain. The researchers open-sourced SimBlock, allowing users to simulate a blockchain network of a large number of nodes, and users can simulate the impact of changes on the blockchain they design. Through simblock simulation, the experimental results are as shown in Figure 2.

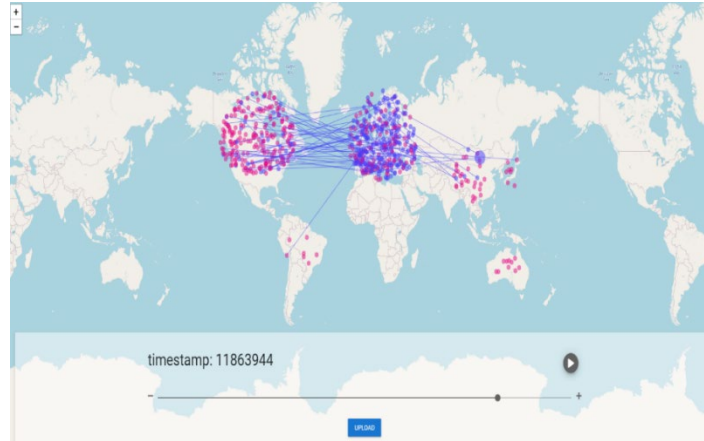


Figure 2: Simblock experimental results

4. Conclusion

At present, the application of blockchain technology in China's tourism industry is still in its infancy, the main reason is the difficulty of applying blockchain technology to the tourism industry, and there are certain doubts about the specific implementation plan of emerging blockchain technology by technicians, tourists and tourism enterprises. In this paper, based on the domestic situation, an implementation plan is designed, and a blockchain-based integrity tourism APP is proposed, through which the design scheme eliminates the skepticism of tourists, tourism enterprises and technicians about the application of blockchain to the tourism industry. Although it is difficult to apply blockchain technology to the tourism industry, its value will gradually be revealed. In terms of integrity tourism, how to maximize the use of the immutability and reliability of blockchain technology, as well as issues such as legality and security, is the general direction that needs to be studied in depth in the future.

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