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Construction of Information Service Platform Based on Blockchain Technology

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Abstract: In order to improve the efficiency of archives management in modern archives information management, blockchain technology can be used to carry out the architecture of archives information service platform, and according to the work requirements of archives information management, relevant operation functions are designed, such as management module design, blockchain data protection module design, file security monitoring module design, etc. This paper analyzes and discusses the realistic path of the construction of information service platform based on blockchain technology.

Keywords: Blockchain technology; Records management; Information service platform; Module design; Data Security

Introduction

In order to tap the potential value of massive archival data, we should realize the importance of archival data encryption protection and mining and cleaning management. To this end, in the process of carrying out relevant work, blockchain technology should be introduced to lay the foundation for the construction of the archives information service platform and promote the high-quality and sustainable development of China's archives management.

1. Analysis of the application scenarios of blockchain technology in archival information management

When modern archival information management is carried out, in order to make a qualitative leap in the level of archival information management, it is necessary to actively explore new paths of digital, automated and intelligent management, and realize the integration of archival information management services. To this end, technical personnel can use blockchain technology to complete the architecture of the archive information management service platform, effectively solve the problem of archival information distortion, and provide a basis for subsequent archival management services, such as archival access, audit trail, supervision and management, and data mining [1].

2. The overall architecture of the archive information service platform based on blockchain technology

As shown in Figure 1 below, the architecture of the archive information service platform supported by blockchain technology is illustrated. In order to ensure the feasibility of the operation of the archives information service platform, the following basic principles should be followed in the actual system architecture design: (1) the data cannot be tampered with, and the data information cannot be modified after it is entered into the system; (2) Data privacy guarantee, based on the support of hash encryption algorithm, which can achieve effective protection of on-chain data; (3) Ease of use, in the management of archive information, in order to ensure the effectiveness of the system operation, the system should be easy to operate and managed; (4) Decentralized design, in the management of archive data information, the data of any node is abnormal or attacked by network viruses, which will not affect the overall operation of the system platform. In addition, in the system platform architecture, the design of management module, data encryption protection module and data security monitoring module is emphasized.

3. Design of the operation function of the archive information service platform based on blockchain technology

3.1 Archives management module design

The management module is the core of archival information management, and the operation of the module will ensure the integrity and security of archival data. With the support of the application of blockchain technology, the technical team focuses on the design of the representation layer, logic layer and data layer when carrying out the design of the file management module, so as to effectively improve the effec-

tiveness of the intelligent management of file information.

The operation of the data layer is mainly to collect, store and index the massive archive data, and with the support of the blockchain hash algorithm, the isolation and consistency of the archive data can always be ensured; The design and operation of the logic layer is mainly based on the operation of RESTful software to complete the information interaction with the data layer, and can realize the management of file data reading, updating, and deletion; The runtime of the presentation layer is mainly based on the application of blockchain technology to complete the distributed storage of massive archive information, and based on the operation of smart contracts, it can realize the control of data access logic and permissions, and effectively ensure the security and reliability of archive information [2].

Through the operation analysis of the file management module, it can be seen that the module can ensure that the system operation has a high degree of scalability, security and stability under the application of the blockchain, because when the system is running, the integration of a variety of technologies is realized, such as distributed storage technology, database technology, cloud computing technology, microservice architecture technology, information retrieval technology, etc., and the architecture scheme of the file information management module is schematic.

3.2 Design of blockchain data protection module

In the management of archival information, in order to ensure the security and reliability of the operation of the archival information management service platform, the design of the data protection module can be carried out based on blockchain technology, which is based on the design idea of distributed ledger, which can effectively improve the overall security and reliability of archival data information. The safe and stable operation of this module is very important, because the encryption effect, storage security, operational transparency, and data traceability of archive data will be affected by the operation of this module.

When designing the protection module in the data layer, the design technical team mainly adopts the design scheme of the distributed ledger to encrypt the archive data, and then store it in the decentralized network node fool, and then use the public and private key software to process the archive data to ensure the accuracy and effectiveness of the archival data information management. The file information stored by each network node can become an independent data block, and is encrypted and protected based on blockchain technology, thus forming an immutable MerKle DAG chain structure. With the support of the operation of the chain structure tree, the efficiency of data storage and processing can be comprehensively improved. After the hash algorithm processes the archive data information, the data stored by the network node can form a mapped hash value to ensure the uniqueness of the archive information.

When the logical layer encrypts and protects archive data, it mainly uses smart contracts to realize automatic data cleaning and screening management of archive information, and ensure the effectiveness of archive data audit trail, sharing and use, and access control. In general, the smart contract at the logic layer is mainly designed on the blockchain, which can realize the automatic operation of the smart contract according to the trigger threshold of the file data information, and in this operation mode, the third-party automatic transaction guarantee can no longer be required for the file information data management, which effectively reduces the management risk of the file data information [3].

When the presentation layer of the archives information management platform encrypts data, it mainly interacts with the logic layer with the help of RESTful API software, and then provides personalized archive information management services according to the different needs of users. In the design of the data encryption protection module at this layer, two schemes, standard HTTP protocol and stateless protocol, are set according to the RESTful API software, which can always maintain the data coupling between the module and the service.

3.3 Design of file security monitoring module

When the archival information management is carried out, it is necessary to design the archival security monitoring module, because based on the operation of the module, the decentralized node network system of archival data information can be constructed, and the encryption and verification management of archival data can be completed when each independent network node is running. In the process of security monitoring, strict encryption measures are taken to ensure the safety and reliability of data sharing and use.

Based on the application of blockchain technology, the smart contract of the security monitoring module can be guaranteed to operate safely and reliably, because the smart contract can be controlled according to the server server during file information management, which can improve the overall operation stability of the security monitoring system. In addition, when the archive information is managed, the combination of on-chain and off-chain storage can be adopted, that is, the hash value and timestamp formed after the mapping of the archive information can be directly stored on the chain to ensure the integrity and authenticity of the relevant archive data.

4. Epilogue

To sum up, this paper takes archival information management as an example, and focuses on the realistic path of archival information management service platform architecture design, aiming to illustrate the importance and necessity of this work. In the future, in the reform

and innovation of archival information management, in order to tap the potential of archival information management, it is not only necessary to summarize the application experience of blockchain technology, but also to introduce new technologies and new systems, and build a rigorous and perfect information archive management system around the working characteristics of archival information management, so that it can play a greater advantage and role.

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