

Exploration of University Library Management Mode from the Perspective of Blockchain Technology

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Abstract: The rapid development of the Internet technology has boosted the exponential growth of the library collection resources and the reader data of the university libraries, and the university libraries are facing a new development situation. This paper analyzes the current situation of university library in book circulation service, resource construction and data storage information security; then expounds the concept and characteristics of block chain technology, and further explores the innovative application of university library management mode under the perspective of block chain technology, in order to provide new thinking for the intelligent development of university library.

Keywords: University library, Book circulation, Resources construction, Information security, Blockchain technology.

1. Introduction

The arrival of the Internet era has brought profound impact on economy, politics, society, humanities and other fields. University libraries also follow the footsteps of The Times and are committed to building intelligent libraries to bring better experience for readers. High and new technology brings development opportunities to university libraries, but also brings a series of challenges. Blockchain, as a "most disruptive" advanced technology, is a new application mode of distributed data storage, point-to-point transmission, smart contracts, and asymmetric encryption algorithms. Its practical application in the field of university libraries can inject new blood into the more traditional management and operation mode of university libraries, and constantly optimize the knowledge service and management mode of libraries.

2. The Development Status and Difficulties of University Library Management Mode

As an important channel of knowledge acquisition for university teachers and students, university library is an important part of higher education teaching resources. Under the background of the Internet technology booming, the library management operation mode is increasingly intelligent, the university library in enjoy network technology for daily management and reader service at the same time, also faces the growth of readers data information security hidden danger and massive expansion of collection resources caused by the book circulation efficiency. The development dilemma of university library management mode is mainly as follows:

First, the book circulation efficiency of university libraries is not high; university libraries are rich in paper collection resources. Although increasingly abundant network data resources, paper books are still the choice of most university teachers and students. At present, most university library is teachers and students borrow books from the library, return after reading, library shelves for teachers and students after borrowing "reader-library-reader" borrowing mode, library as a "transit" management makes the book borrowing process

growth, increase the book circulation delay, also led to the opacity of books borrowing information.

Second, the resource construction of university libraries is not perfect; "information island" adopts independent development mode. University libraries purchase book resources according to the major setting and the needs of teachers and students. Due to the existence of repeated specialty setting, it leads to the homogenization of book resources in some universities [1], Data resources are even more. Since the copyright of the database is in the hands of the platform service providers, university libraries need to spend a lot of money every year to buy Chinese, foreign languages and other databases, resulting in a waste of capital and storage space. The resource construction system of university library needs to be improved urgently.

Third, the data information system of university library has security risks; the development of Internet technology boost the university wisdom of the library, a large number of reader data and data resources stored in the Internet, the university library service system is not strong enough, the system in the open network environment, hackers, system crash and reader privacy leakage, but also faced with the possibility of collection resources theft, lost.

3. Research on the Innovative Application of University Library Management Mode from the Perspective of Blockchain

3.1. The Concept and Its Main Characteristics of Blockchain Technology

Blockchain originated in bitcoin, in the formation process of Bitcoin, block as a storage unit, recorded all the information of each block node within a certain period of time, block through the hash algorithm connection, block and block with the expansion of information records, the result is the blockchain. Blockchain is essentially a distributed shared ledger and database covering a number of science and technology, including mathematics, cryptography, the Internet and computer programming. It mainly has the following characteristics:

Decentralization of the data: Under a traditional central database, all data participants must rely entirely on the database owners, such as Alipay, wechat and banking systems, etc. Ordinary users can only have limited access to, update and delete database information. The blockchain uses distributed ledger technology to record data, that is, through P 2P network to each node in the shared network, and the nodes have equal access to the transaction information on the blockchain, weakening the role of the traditional database, and forming a distributed system with decentralized nature.

Permanent and safety of the records: Blockchain uses hash value to connect the block, introduces workload proof mechanism and timestamp technology to ensure the accuracy of each block data from the source, realizes the integrity of each block data on the blockchain, and the recorded data cannot be tampered with at will. For all the data in the transmission process, the public key is used for encryption, and the private key is decrypted. The asymmetric encryption technology can ensure the stability of information transmission between nodes, and well protect the user's privacy information. The above technology effectively ensures the permanent and security of information recording [2].

Information is transparent and imitable: The core technology of blockchain also include smart contract mechanisms. All participants in the contract determine the execution agreement through negotiation and write the computer-readable code in the form of a smart contract. All users on the blockchain can see the blockchain-based smart contract. Once the program is executed, all participants shall not modify the operation program and the data. Thus ensuring the transparency and tamper of information on the blockchain.

3.2. Innovation of University Library Management Mode from the Perspective of Blockchain

Block chain as today's "most disruptive" new technology, its distributed accounting technology, asymmetric encryption decryption technology, smart contract technology and workload proof mechanism and other core technology, can effectively strengthen the university library readers data privacy and security protection, realize the resource construction mode innovation, to realize the library wisdom services provide technical support and data support. The specific function is provided in the following aspects:

3.2.1. Improve the Efficiency of Library Book Circulation

Through distributed ledger technology, blockchain can realize data decentralization and realize the transformation of borrowing mode from "reader-library-reader" to "reader-reader"[3]. College teachers and students can borrow books after the user certification. In the book borrowing system, each reader as a node on the block chain, can query all books borrowing information, at the same time any node borrowing information is recorded by other nodes and supervision, the system of borrowing users can query to the books borrowing information directly with users and read books, without the transition through the library, the decentralized borrowing system can effectively save the time needed for paper borrowing, realize the collaborative management of readers and library.

3.2.2. Optimize the Book Borrowing System

In addition to the rich paper books, online digital resources

are also an important collection resources for university libraries. College teachers and students can search in the book borrowing system to obtain the resources they want to find. The vastness of book resources may make it a longer time to consult. University libraries have developed a reading and sharing platform in the book borrowing system, where teachers and students can share their experiences in reading literature or books. The distributed bookkeeping technology of blockchain can realize that any user in the system can access the reading experience of all other users, which can better help users find the books they want, save retrieval time, and also provide a new channel for book sharing and reading feedback.

3.2.3. Create A Platform for Resource Sharing Among University Libraries

Colleges and universities can take major setting as the entry point. Colleges with high degree of major setting overlap can form an alliance to negotiate to determine cooperation agreements, and embed them in the blockchain in the form of smart contracts to form the university library alliance chain. Teachers and students can borrow the book resources of other university libraries through application, so as to reduce the homogenization of the library resources of university libraries and improve the utilization rate of resources. For some important data resources, the university library can upload metadata to the block chain, need to use the resources in the borrowing system reading permission application, managers through the hash algorithm will receive application information into specific values, using the resources from the database, package to application users, effectively ensure the security of library resources between inter-library. University Library Alliance chain [4] The establishment of the original isolated university libraries can be combined to break the deadlock of "information island" and alleviate the waste of repeated resources to a certain extent.

3.2.4. Maintain the Information Security of University Libraries

Blockchain distributed accounting technology realizes the synchronization of data between all nodes, if the data resources of a node are lost due to viruses, the same resources of other nodes can be transmitted to synchronize data to realize information sharing; blockchain timestamp technology ensures the accuracy of user information from the source, its traceable characteristics can help managers quickly find the security risks; blockchain asymmetric encryption technology ensures the security of data transmission between nodes, effectively solves the problem of university library data resources in the Internet era. Using blockchain technology in the field of university library management can greatly solve the problems in the field of information security.

4. Epilogue

Blockchain, as an advanced technology that still needs to be deeply explored in the Internet era, has broad development prospects. Applying it to the field of university libraries will continuously optimize the traditional management and operation mode of university libraries, provide readers with more reasonable and high-quality knowledge services, and promote the high-quality development of university teachers and students in the new era.

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References

- [1] LanBin. Application of blockchain technology in university libraries under "Internet +" [J]. Media Forum, 2019,2 (24): 146-148.
- [2] Zhang Jie. Research on the Data Security of University Library Readers based on Blockchain [J]. Media Forum, 2021,4 (19): 144-145.
- [3] Hua Jing. The Application Research of Blockchain Technology in the Field of University Libraries [J]. Office business, 2021 (17): 187-190.
- [4] Wang Kewen, Yang Yawen. Analysis of the digital resource co-construction and sharing model of university library based on blockchain [J]. Library Research, 2021,51 (05): 1-6.