

Application of Blockchain Technology in City Public Library Management

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With the rapid development of information technology , new technologies such as "Internet + ", mobile Internet, "blockchain" technology, and artificial intelligence have emerged endlessly. Blockchain has attracted attention from all walks of life due to its decentralization, immutability, and traceability, and has also empowered all walks of life. The library management industry and blockchain technology belong to the category of information management and information systems, and naturally have synergistic effects. According to media reports, in September 2017, the first domestic blockchain theme library was unveiled in Qianhai, Shenzhen. Some scholars also explored and researched the blockchain-enabled book management. The author tries to explore the feasibility of blockchain-enabled book management by taking his own working practice as an example.

The blockchain is basically a distributed database. Its operating mechanism is to obtain a random number and letter combination with extremely low repetition rate through the random generation of a hash value (HASH , also known as a hash, similar to the "ID card" of a piece of data), and synchronize it across the entire network. Then, it will generate the next hash value to ensure that the data is unique, immutable and traceable. At present, the main forms of blockchain include public, alliance, and private chains. The public chain is criticized by the industry due to its high redundancy and low TPS (the number of information exchanges processed per second), and the alliance chain and private chain are relatively efficient in processing information. Because the library needs to record a large amount of information, this article intends to discuss the blockchain-enabled book management method in the alliance chain or private chain category.

First, after the big data is on the chain, it is easy to trace and analyze

The duties of book management include putting all kinds of books into different categories, and also managing the lending and return of various books. At present, book management has accumulated big data such as reader information, borrowing records, and book admission. However, islands are formed between data. Blockchain, as a tool and carrier, can break these data islands and use data efficiently.

Specifically, we can match the book borrowing data with the reader's identity data and record it on the blockchain to form decentralized decentralized procurement such as "PDA (Reader Decision Purchasing)", so that readers can read the books they want to read and can make the library better to provide services from the perspective of the server.

We can also match the number of books purchased with the data of book borrowing and record them on the blockchain to form a library cost-effective book plan. Let every penny be spent on the blade. Ensure that every database and every book you buy can be used efficiently and benefit more readers.

Second, the blockchain empowers book procurement and presentation

Now is the era of information explosion. Whether it is the traditional book purchase or the emerging library purchase, it is the product of centralization. The centralization of traditional libraries is easy to understand. Library workers are "gatekeepers" in the process of purchasing, filtering, and presenting book categories. However, emerging libraries use huge reader data, apply mature algorithms, and readers' preferences to purchase and display books. If they like, they will see more related books, which will easily lead to the tragedy of "nipple music" and damage the publicity of the library.

Some people believe that the decentralized and traceable nature of the blockchain adds more open rules to the book procurement process. However, I believe that blockchain technology has a limited role in evading invalid purchases and reshaping the public nature of libraries. Of course, the vision described by the believers of

blockchain technology is to place the production and procurement process of books on the chain in accordance with the time sequence, and through consensus algorithms, use the voting mechanism to determine whether books need to be purchased, thereby eliminating fake books and poor books. But at most, it can only facilitate people to go to the source of book production. It cannot guarantee that the books that most people agree with are genuine books and good books. Even if there is a token that motivates people to judge the authenticity and quality of books, this is still difficult to achieve. If readers vote to decide book purchases, they are indeed upside down.

In my opinion, the application of blockchain in book procurement is more reflected in the selection of high-quality content. First, the token economy can be used to stimulate original content creation. The current book publishing does not lack content, what is lacking is quality content. For example, the Sino-U.S. Trade war has become the focus of readers. The readers look forward to the interpretation of the situation by experts in Sino-US relations and the research and judgment of economic trends by macroeconomic experts. However, the book market is full of alarmists who are out of context. We can use the consensus algorithm to calculate good books with high-quality content, so that we can buy more and place it in a prominent position, and creators of high-quality content can also get more rights. Instead of just relying on readers' preferences, they push a large number of good and bad books to readers, so that they can be immersed in authenticity.

The phenomenon of "laundering" in the current book market is constantly banned. It often happens that "Li Gui" reads more and spreads more than "Li Zhi". Not only does it harm the content creators, it can sometimes mislead readers. However, because "laundering" is not a simple plagiarism, it may just borrow ideas and examples, and the way of expression is often different from the original. It is very difficult to identify and claim. We can combine corpora such as word frequency and word order with blockchain technology, so that the manuscripts of the "manufacturers" cannot be uploaded to the chain and the problem of "manufacturing" can be avoided.

As Zhang Zheyu, Director of Blockchain Business of People's Network, said in the development of the past few decades, outstanding traditional book publishers form the

rigorous acquisition and editing system, the rapid response ability and the professional skills of book editors, which are enough to make traditional high-quality publishers become the "super node" of the blockchain book market and become a referee who judges whether a book can be uploaded and a goalkeeper who controls whether the content orientation is compliant.

Third, blockchain empowers book copyright protection

IP (Intellectual Property) is the assetization of the rights of cultural and artistic and intellectual achievements, which reflects the core values of intellectual and intellectual achievements, including the fruits of knowledge labor such as patents, film and television, images, short videos, music, photography, e-books, online novels and creative ideas. At present, IP is developing at a high speed with the trend of mutual integration. The scale of China's Internet digital culture industry is at least one trillion yuan, but property rights protection is not strong, piracy is rampant, creators can only get extremely meager returns, and there are pain points such as difficulty in confirming rights, difficulty in proving rights, and difficulties in property rights transactions. It is not uncommon for book procurement to encounter pirated books.

Blockchain makes IP permanent, non-tamperable, and permanently traceable. Participating nodes distributed around the world jointly maintain and manage the IP database. Even if very few nodes are damaged due to network attacks, natural disasters or other human factors, the entire block of data will not be lost or damaged.

The author believes that the protection of book copyrights (including e-books, audio and video intellectual property rights) enabled by the blockchain is mainly applied to the following three areas: First, IP Originality Certificate. Encrypt and upload the original author information, work content information, creation time information and initial dissemination information of cultural products to the blockchain, and clarify the ownership of copyright, trademark and patent rights. For example, Baoquan takes screenshots and source code of the target webpage through a network plug-in, generates operation logs, records the call time, packages the content, calculates the hash value, and uploads it to the FACTOM blockchain (a public chain. The

application scenario is to ensure documentation the validity, integrity, history, and ownership of data, files, and database information) and the Bitcoin blockchain for electronic data preservation.

Second, the intellectual property exchange certificate. Uploading the information of intellectual property creators, intellectual property rights acquirers, and transfer time and method to the blockchain can effectively reduce intellectual property transaction procedures and reduce transaction costs. China has released a micro-film blockchain copyright (transaction) service platform jointly created by China Copyright Protection Center, China Micro Film Culture Media Center, and others. Book procurement on such a copyright trading platform will greatly reduce the possibility of encountering piracy.

Third, proof of intellectual property rights. In this regard, a case law of Hangzhou Internet Court is quite representative. The relevant person in charge of the Hangzhou Internet Court stated that as a form of information stored in electronic media, electronic evidence has inherent deficiencies such as virtuality, vulnerability, concealment, and easy tampering. Blockchain is open, distributed, and irreversible. As an electronic data storage platform, it has the advantages of low cost, high efficiency, and stability. For electronic data that uses the blockchain and other technical methods to store and fix the certificate, it should be conducted case analysis in an open and neutral manner. The Hangzhou court adopted the evidence related to the blockchain certificate, not just based on the blockchain certificate itself, but a combination of factors. For the protection of intellectual property rights, blockchain technology is essentially a trusted tool supported by multiple technologies, similar to digital cameras and screen recording software. The purpose of blockchain technology is to objectively record evidence, and not anyone can upload data to the blockchain as evidence.

Fourth, blockchain empowers education in libraries

The library is one of the best scenarios for realizing lifelong learning, online learning, mobile learning, and distributed learning. Various types of schools, business training

institutions, examination and certification institutions, and industry associations often borrow library space for lectures and educational activities. At the same time, it also faces problems such as high operating costs, difficult resource sharing, low resource quality, and easy academic fraud. Blockchain technology can empower all aspects of education in the library and alleviate the above pain points.

The MIT Media Lab has released a blockchain-based academic qualification verification system that lists the name of the certificate recipient, the content of the certificate, the name of the issuer, and the issue date and use a private key that only the issuing party can access to sign the certificate content and generate a hash as a watermark for later verification if someone has tampered with the content of the certificate. Based on this system, on a search engine webpage, The user enters the name of the certificate recipient to check the true academic credentials. In terms of management authority, the certificate owner can choose which certificates are disclosed, and decide the scope of each certificate, and even mark the data blocks that are no longer used to achieve the effect of "deleting" the certificate. China Central University of Finance and Economics, Century Internet, and Microsoft have also developed similar systems.

Many libraries have introduced online education. This method of education is popular with readers for its flexible time and place. Online education transactions based on smart contracts, without the need for third-party payment platforms like Alipay, can implement point-to-point transactions between learners and training institutions, learners and teachers, institutions and institutions, strengthen resource copyright protection, and ensure the authenticity of transaction information, eliminate fraud, meet consumer demand for real-time knowledge acquisition, and reduce operating costs. In the Q & A of teaching and other links, digital tokens can be used as an important indicator of measuring community contribution. It is easy to establish a core incentive mechanism, transfer the ecology, and encourage high-quality resources to stand out.

Of course, blockchain empowers the education industry in libraries also faces some challenges. E-educational resources occupy a huge amount of network space, and

blockchain technology is redundant. It is not suitable to put all electronic education resources on the chain. It is recommended to introduce a solution for the layering of the public chain, and only upload information on the key links such as confirming copyright and resource purchase. A large amount of electronic education resources are still stored and circulated off-chain. In addition, the application of blockchain technology in the field of education in the library may have privacy issues, lack of flexibility, and other problems. It is related to the immature blockchain technology or the existing management mechanism, which needs to be adjusted.