The Application of Block Chain Technology in Medical Management

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ARTICLE INFO	ABSTRACT

With the gradual development of social economy, the social function of medical institutions is becoming more and more important. Strengthening the efficiency and quality of medical management can alleviate the contradiction between doctors and patients and improve the level of medical service. Promoting the sustainable development of medical institutions plays a key role. Under the background of the development of science and technology, the theoretical research and practical application of block chain technology are becoming more and more mature, which can not only store and transmit information effectively, but also strengthen the security of information storage. The effective combination of block chain technology and medical management can create a new operation mode and train of thought for medical management and promote the overall improvement of medical management quality and efficiency. It is very helpful to optimize the social service function in medical field. This paper mainly expounds and probes into the concept characteristics of block chain technology, its concrete application in medical management, application effect control strategy and so on. It aims to further strengthen the depth and breadth of application of block chain technology in medical management, provide strong power support for the improvement of medical management service level and promote the sustainable development of medical and health industry.

1. Introduction

The function of medical institutions in social development is increasing, the business is increasing gradually, and the pressure of medical management is also increasing day by day. It is necessary to optimize and innovate the traditional medical management mode. In order to meet the high demand of medical management in the new period, block chain technology is a decentralized distributed record and storage database.

2. Overview of Blockchain Technology

(1) Concepts and characteristics
Block chain technology is a decentralized distributed bookkeeping technology. By constructing a database, the related data are recorded and stored distributed, and different blocks are effectively combined by using the chain mode. In forming a systematic data structure system, block chain technology has the characteristics of non-tampering, traceability, openness, security, data recording sequence and so on. It can not only guarantee the privacy and security of data, but also share data, so that participants can reach a consensus on data sequence, security, sharing, maintenance and so on [1]. These characteristics of block chain technology, it strengthens its decentralization and de-trust application core, and simplifies the process of data application. In general, block chain technology is a distributed linked account book, and it is encrypted and

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managed by complicated cryptography to ensure that the account data can not be tampered with, and all the data in the account book can be traced back.

(2) Characteristics of application of blockchain technology in medical management

The block chain can generate large data for each link of medical service management, such as medical record information, hospital internal information, drug use information and so on, and cause non-tampering, and ensure the security of its data information. The main application features are as follows: using the decentralization of block chain, combining cloud storage technology, expanding the storage space of medical information, and realizing seamless connection and sharing of information data; using public-private key consensus mechanism the anonymity and confidentiality of data information in the sharing process, and strengthening the privacy security of medical management information [2].

3. Problems of Medical Management in the Context of Information Technology

At present, the process of medical information management informatization is not very ideal, which seriously affects the improvement of its comprehensive level of informatization and limits the improvement of the efficiency of medical service industry in China. The main performance is: medical information sharing is difficult to achieve, due to the lack of unified block chain technology application standards and norms, many medical institutions hold a wait-and-see attitude, and in their own interests, there is resistance to information sharing; Lack of perfect medical service management quality supervision mechanism, leading to medical service quality problems, serious doctor-patient contradictions, seriously affect the healthy development of China's medical industry; The traditional medical insurance claim process is more cumbersome, inefficient, time-consuming, and the compensation results are prone to deviation and other problems, seriously reduce the patient's medical service experience, but also bring some obstacles to the sharing of medical information [3].

Application of blockchain technology in medical management

(1) Establishment of electronic health records

Using blockchain technology can establish personalized electronic health files for patients and store them in data sharing centers. When patients seek medical treatment, doctors can quickly and intuitively understand and view the patient's medical records, disease history and other information, and can use the traceability characteristics of blockchain technology to trace the traces of medical activities received by patients in the past. In the electronic health file, patients can also view their own examination results data, such as doctor diagnosis results, electrocardiogram, imaging and other data information, so as to have a clearer understanding of the condition and health planning [4,5]. In addition, using the relevant functions of block chain technology, we can also make comprehensive encryption settings for electronic health files, which can not only share data, but also ensure data information security, let patients set their own access rights, and set up custom encryption methods to ensure patient privacy.

(2) Strengthening the whole process of drug supervision

Drugs play a key role in human health. Once drugs are made and sold, they will pose a serious threat to the life and health of patients. Therefore, the block chain technology can be used to track and record the production, sale, management and use of drugs dynamically, and the whole life cycle of drugs can be traced back as the main basis of drug market supervision. When patients buy and use related drugs, they can upload relevant data to the information sharing center and compare with the relevant information of the database constructed by block chain technology, so as to identify and judge the truth and hood of drugs. Can not only protect patient life safety, but also strengthen drug market supervision and effect [6].

(3) Medical insurance claims

In the traditional medical insurance claim mode, the policyholder needs to go through many links and processes to get the claim payment, in which he has to pay the medical expenses —— obtain the expense list —— the insurance company claims and so on. Because the claim company involves the problem of data information confidentiality in the process of docking with the hospital, the process is often complicated and long, time-consuming and inefficient. Under the background of block chain technology, it can effectively improve the efficiency and experience of medical insurance claims. This is because the block chain technology has the characteristics of non-tampering and traceability, which can record the trace of data change in detail and comprehensively, thus ensuring the security of data information. Based on this, a block chain platform can be constructed to store related information data distributed to enhance the comprehensiveness and security of data information. Moreover, the data information can not be tampered with to prevent the dispute over the related contract in the process of claim settlement, and through the effective fusion of block chain technology and artificial intelligence technology, the related cost information, contract and so on can be intelligently verified, thus

providing the basis for the automatic execution of this process [7,8]. The hospital and the insurance company jointly construct the intelligent contract block chain platform, form the data sharing account book, realize the medical insurance information sharing, simplify the medical insurance claim process, shorten the application time, improve the overall working efficiency of the medical management, and strengthen the medical service experience.

(4) Improving medical records of electronic operations

The block chain technology is used to record and store the surgical records comprehensively, and its non-tampering and traceability characteristics are used to ensure the authenticity of the original data, which is convenient to provide the basis for the investigation of medical malpractice responsibility and to clarify the relevant responsible persons [9,10].

4. Control Strategy for Application of Blockchain Technology

(1) To sum up experience and improve the promotion effect

The application of block chain technology in medical management started late, practical application experience is less, in the concrete application is still in the groping stage, the operation effect is affected to a certain extent. Moreover, the application of block chain technology poses a great challenge to the previous medical management model, and some medical institutions dare not apply it in depth, which leads to its promotion and application effect is not ideal. And in the domestic and foreign application, it has not formed the unified use standard and the basic standard. Many medical institutions adopt the wait-and-see attitude to it. Based on this, it is necessary to publicize blockchain technology in a wider range, strengthen people's overall understanding and understanding of it, and enhance their confidence in application. Build a good blockchain academic research atmosphere and environment, build a perfect blockchain medical management knowledge training system, strengthen the learning motivation of medical managers, strengthen the academic interest of experts, and ensure the deep application of blockchain technology in medical management [11,12].

(2) Expansion of data storage space

The block chain database records and stores the dynamic changes of each data from generation to development, and it also takes up part of the space during the download, transfer, update and use of its data. Especially when the data of all nodes run synchronously, it brings great pressure to the storage capacity of the database. It is very likely that the medical information can not be updated in time because of the insufficient storage capacity, which affects the efficiency of medical management. Based on this, we should pay attention to strengthening the scalability and affordability of block chain database, optimize and perfect its decentralized storage system, expand its storage capacity, and build a decentralized business model in combination with specific conditions. Expand storage space and build a global scale of hard disk storage space [13].

(3) Enhanced data security

Because block chain technology runs under the background of network information technology, even if it takes diversified encryption measures to ensure the security of block chain data, but because of the open characteristics of network technology, There are still some risks in data security and secret security. Based on this, we should optimize the key mechanism, improve the private key storage mode, strengthen its encryption effect, integrate the dynamic encryption technology and DES algorithm encryption technology, give full play to the functional advantages of complex cryptography. The access rights of users are effectively controlled and block chain data are encrypted to ensure the privacy of medical data [14,15].

5. Conclusions

To sum up, with the trend of diversification of medical institutions, the quality and efficiency of medical management quality and efficiency of medical management. In combination with the concept and technical characteristics of block chain, we should explore the convergence of block chain technology and medical management, strengthen the effective combination of the two, give full play to the technical advantages of block chain, and carry out deep application in electronic health files, drug supervision, medical insurance claims, surgical information records, etc.

References

[1] Jiang Xuhan, Tang Yanjun. Construction of Hospital Emergency Financial Information system under Block chain Technology [J/OL]. and Friends of Accounting , 2021(08):150-154[2021-04-01]. http://kns.cnki.net/kcms/detail/14.1063.F.20210329.1709.046.html.

[2] Liu Zhenfeng. Application of Block-chain in Medical Field [J] Study Network Security Technology and Applications ,2021(03):107-108.

[3] Shen Shiyong, Zhang Sha, Hu Siyang. Application of Block chain Technology in Medical and Health Field [J] Research Progress Social Policy Research, 2021(01):93-104.

[4] Xu Haokai, Tan Huidong, Ye Yiyang, Zheng Gui-

feng, Shi Haowen. Visual Auscultation and Electronic Medical record system based on Block chain [J] Computer Knowledge and Technology 17(05):1-3.

[5] Zhang Chen, Ma Sugang, Li Yumou, Niu Jian. Block chain-based medical systems [J] and Modern Electronic Technology ,2021,44(04):133-137.

[6] Cao Yibo, Xu Shiyuan, he Jiahuan, Wu Huanyu, Xu Tianrun. J]. of medical material transaction management system based on block chain Digital World, 2021(02):239-240.

[7] Gong Fangfang, Sun Xizhuo. Application and Prospect of Block chain Technology in Medical Field [J] and Modern Hospital ,2021,21(01):1-3.

[8] Mao GE, Li Jing, Zhu Qiao, Luo Hanhua, Zhang Qi, Xie Gang. Application Prospect of Block chain Technology in Medical Field [J] and Journal of Hubei University (Natural Science Edition)(01):86-90.

[9] Wang Qian, Li Ruihua, Yuan Ye. A Study on the Management Mode of Medical Equipment in Public Hospitals Based on Block-chain Technology [J]. Finance and Economics 2021(01):71-73.

[10] Li Nannan, Yin Zejun. Application and Analysis of Block-chain Technology in Medical Management [J] and Technology and markets ,2020,27(11):67-68.

[11] Yang Chunsong, Zhang Lingli, Gao Shan, Yang Yaya. Evaluation of Application of Block-chain Technology in Chinese Medicine [J] China Pharmacy ,2020,31(17):2060-2064.

[12] Zhou Chenyang. Exploring the Security Management of Medical big data based on Block chain Technology [J] 5 China's collective economy 2020(23):154-155.

[13] Liu Yue. Application of Block chain Technology in the Field of Internet Medical and Health Supervision [D] and Nanchang University ,2020.

[14] Wu Shan, Zhang Yuanyou, Xing Wensheng. Application and Prospect of Block-chain Technology in Medical and Health Field [J] Electronic Technology and Software Engineering ,2019(10):172.

[15] he Bo, Wang Guisheng. Application Analysis of Medical Management Informatization Based on Block-chain Technology [J]. Journal of Sichuan University (Natural Science Edition)(06):1219-1224.