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Systematic Review on AI-Blockchain Based E-Healthcare Records Management Systems

M. Praveen kumar, Mr. M. Manikandan, Mr. R. Pandimeena

PG Scholar, Department of Master of Computer Applications, Vidyaa Vikas College of Engineering and Technology, Tiruchengode, Tamilnadu, India

Professor, Department of Computer Science Engineering, Vidyaa Vikas College of Engineering and Technology, Tiruchengode, Tamilnadu, India

Assistant Professor, Department of Master of Computer Applications, Vidyaa Vikas College of Engineering and Technology, Tiruchengode, Tamilnadu, India

ABSTRACT: In this project, we propose the development of an advanced E-Healthcare Records Management System using a combination of Artificial Intelligence (AI) and Blockchain technology. The system aims to enhance the efficiency, security, and interoperability of healthcare records by leveraging AI for intelligent data organization, analysis, and retrieval, while utilizing Blockchain for ensuring tamper-proof data integrity and privacy. Through the integration of these cutting-edge technologies, the E-Healthcare Records Management System aspires to revolutionize the healthcare industry by streamlining data access, reducing errors, and maintaining utmost data security and privacy.

I. INTRODUCTION

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

II. LITERATURE SURVEY

1)   BLOCKCHAIN-BASED ELECTRONIC HEALTH RECORD SYSTEM FOR EFFICIENT COVID-19 PANDEMIC MANAGEMENT
AUTHORS: FAHEEM AHMAD REEGU, SALWANI MOHD DAUD AND SHADAB ALAM

The shift from paper-based to electronic health records (EHR) in healthcare institutions has led to the need for secure data exchange and user access management. EHR systems require confidentiality, integrity, interoperability, and consumer control. The COVID-19 pandemic prompted the development of record-storing apps, raising data protection and trust concerns. Blockchain offers data immutability, confidentiality, and distributed storage. This paper explores blockchain's potential for EHR and its use in COVID-19 management, despite privacy and adoption challenges.

2)   BLOCKCHAIN FOR 5G-ENABLED IOT FOR INDUSTRIAL AUTOMATION: A SYSTEMATIC REVIEW, SOLUTIONS, AND CHALLENGES
AUTHORS: ISHAN MISTRY, SUDEEP TANWAR AND SUDHANSHU TYAGI
The Internet of Things (IoT) has enabled widespread computing through global internet connectivity. In 5G-powered industries, IoT connects billions of devices for rapid data transfer during information collection and processing. However, existing centralized protocols face issues like access control and single points of failure. To address this, a decentralized access control mechanism is needed for device-to-device communication in industrial IoT. We explore the integration of 5G-enabled IoT and blockchain for secure industrial automation in various sectors like Smart Cities, Healthcare, and Agriculture. Blockchain offers decentralized access control and enhances privacy. We review current proposals and their potential in different sectors, analyzing challenges and offering a comparison for end users to make informed choices.

III. PROPOSED SYSTEM

Proposes a Blockchain-Based Anonymous Reputation System (BARS) to construct a trust model that protects the privacy of Vehicular Ad Hoc Networks (VANETs), which communicate anonymously using a public key as a pseudonym.

It tries to prevent the spread of falsified messages using a reputation assessment algorithm that evaluates the message's quality. On the other hand, it exploits the properties of a lexicographical Merkle and eliminates the chance of the public key being linked to the real identity. Such system can be replicated for HER privacy handling too by taking advantage of the features used.

Advantage:
- Single-chain blockchains may be more advantageous when just the performance records of AI apps need to be preserved in perpetuity.
- Coin burning lowers the number of coins on the ledger, resulting in a gradual increase in coin value, amount balancing of currencies on the blockchain, the spending of unsold coins, and payment of the transaction cost.

Flow diagram
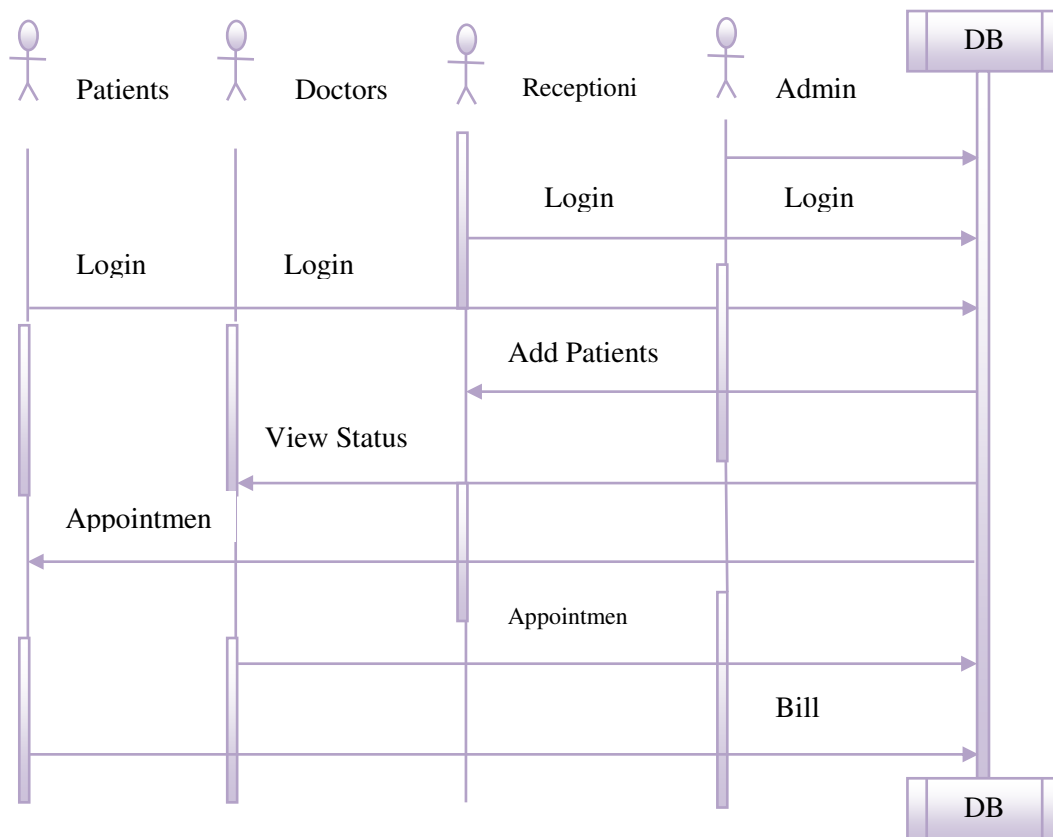
MODULES

BLOCKCHAIN MODEL:
- A blockchain may be thought of as a decentralized public ledger that is accessible to all peers in a network where all committed, valid, and completed transactions are stored in a list or chain of blocks. The chain grows as new blocks are appended to it continuously.
- Blockchain technology employs a combination of two technologies: asymmetric cryptography and P2P distributed consensus to guarantee ledger consistency and user security. Hence, this time stamped blocks are linked together by a cryptographic hash. Typically, each block contains transaction records that have been verified by peers, often known as miners. The chain is continually lengthened, with each new block being added to the end.

STORAGE MODULE

- A Centralized data server raises the issue of vulnerability in terms of privacy and security concerning the users' personal and sensitive data, such as financial information, health records, whereabouts, and activities.

Furthermore, as AI applications attempt to analyze, transform, and store massive information, wide-scale data collection would reveal the centralized infrastructure's scalability and capacity constraints.

* Blockchain-based decentralized storage architecture enables reliable cryptographic data storage across collaborating networks.

DATA MANAGEMENT MODULE:

* AI applications must manage data in such a way that is highly applicable and precise, with full datasets obtained from credible data sources, along with effective decentralized storage. In the underlying network, AI applications traditionally have used centralized data management techniques operated across all nodes.

* These strategies include but are not limited to, data segmentation, filtration, context-aware storage systems and transmission in underlying architecture, as well as temporal and intelligent management of data systems.

DEPLOYMENT MODULE:
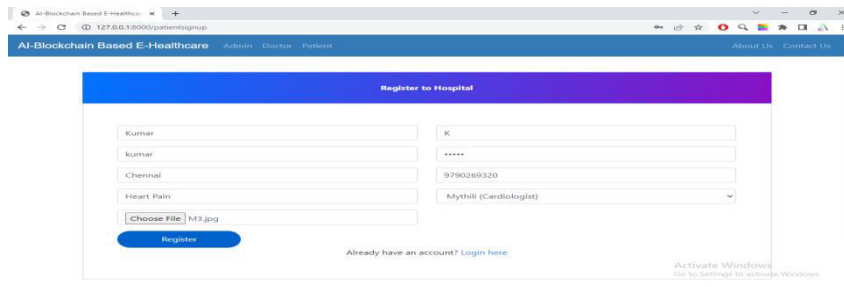
* A trained model's true performance is evaluated after the distribution in production settings. Model deployment, on the other hand, is a regular and repetitive process as the developers must constantly improve the models and rectify bias by generating a certain set of findings while disregarding the rest of the options to provide particularly useful and educated judgments. Model deployment is considered a simple iterative process in centralized systems.

BLOCKCHAIN-AS-A-SERVICE MODULE:

* In the process of seizure detection from EEG recordings, a series of post-processing are needed to carry out on the outputs of the trained Bi-GRU network to obtain the category labels of testing EEG. Then the filtered outputs are compared with a threshold determined in the training stage of Bi-GRU classification model.

* The emergence of BaaS is projected to benefit both consortium and private blockchain firms by allowing them to concentrate on creating value through apps development, validation, and implementation rather than worrying about the infrastructures associated with the storage, underlying network, and computation.

IV. EXPERIMENT AND RESULT
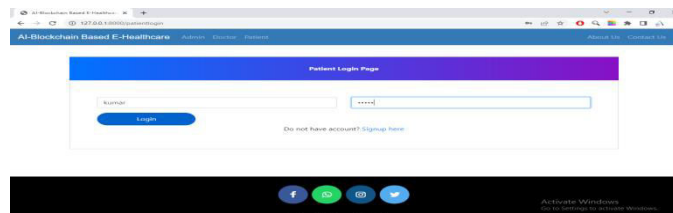
Patient Register on Hospital:

Patient Login:

Admin View New Patient Details:

Patient Home:

Patient Book Appointment Process:

Patient View Appointment Status:

Admin View New Doctor Appointment Details:

Admin Approve on Appointment:

Doctor View Patient Appointment Approve Details:
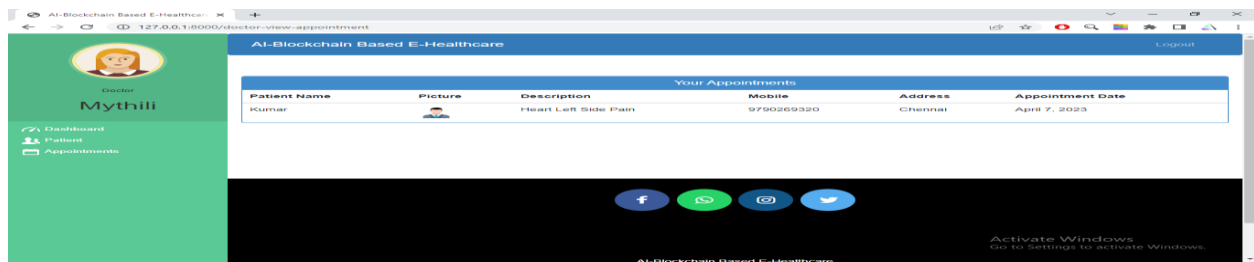
Doctor View Patient Details:
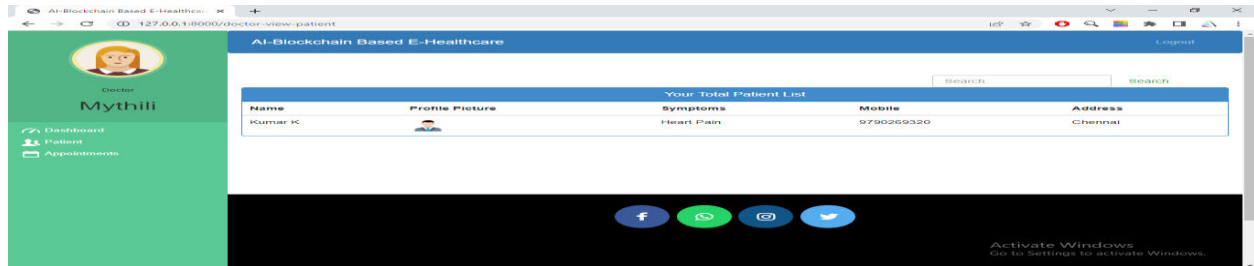
Patient View Approve Appointment Status:

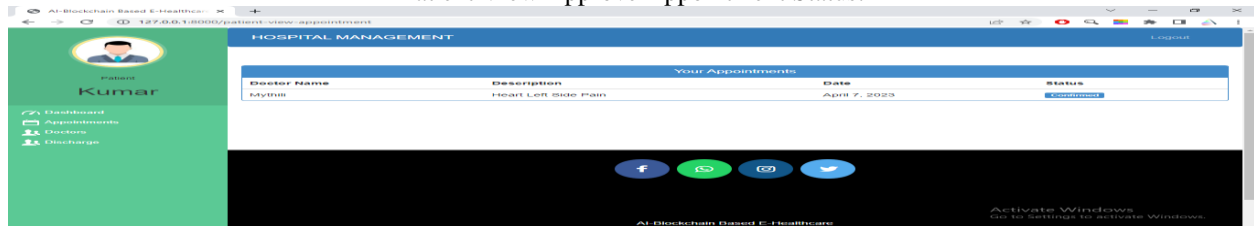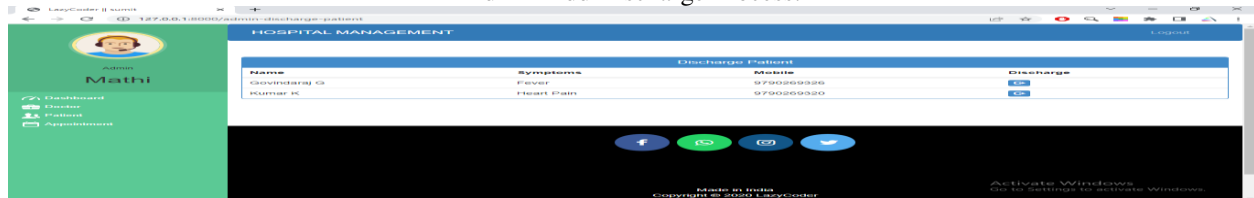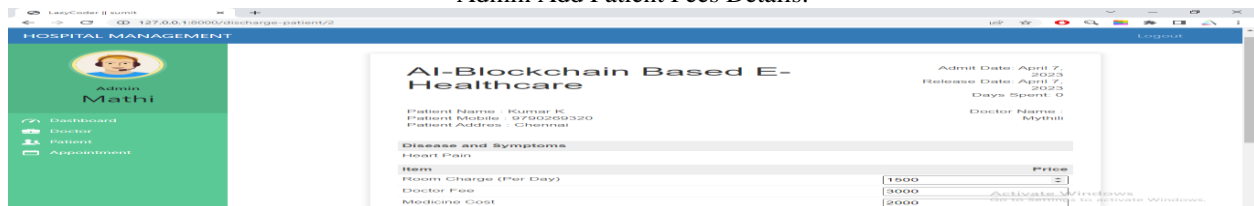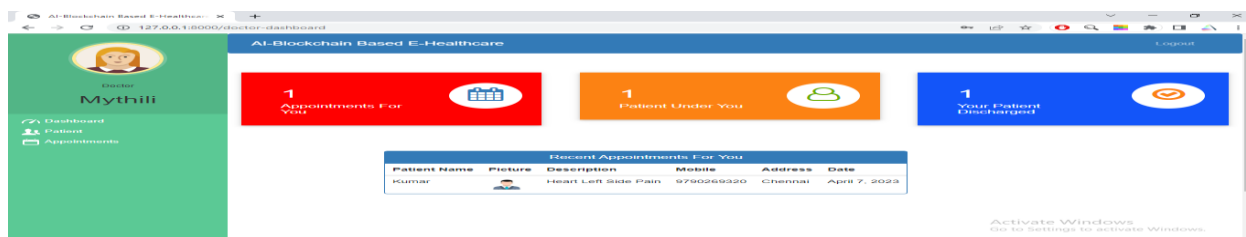Admin Add Discharge Process:

Admin Add Patient Fees Details:

Admin View Total Bill:

Doctor View Patient Discharge Details:

Patient View Discharge Fees Bill Details:

IV.CONCLUSION

The convergence of blockchain technology and Artificial Intelligence (AI) is expected to have a transformative impact on various industries, particularly healthcare. In the healthcare sector, blockchain applications are anticipated to leverage AI approaches to bring about significant changes. These changes would not only involve openness and security but also lead to an enhancement in healthcare quality while reducing costs.

The proposed framework discussed in your work likely focuses on how blockchain technology can be applied in the healthcare industry. It appears that you have explored various aspects of integrating blockchain into healthcare and have identified major research projects in this area. These projects might involve creating new applications, improving existing processes, or finding innovative ways to leverage the combined potential of blockchain and AI.

The conclusion emphasizes that the utilization of blockchain technology in healthcare has the potential to revolutionize the industry by ensuring transparency, security, and efficiency. It suggests that by combining the strengths of blockchain and AI, researchers and professionals can contribute to the advancement of healthcare solutions that are not only effective but also cost-efficient. Overall, the conclusion highlights the promising The convergence of blockchain technology and Artificial Intelligence (AI) is expected to have a transformative impact on various industries, particularly healthcare. In the healthcare sector, blockchain applications are anticipated to leverage AI approaches to bring about significant changes. These changes would not only involve openness and security but also lead to an enhancement in healthcare quality while reducing costs.

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📱 +91 99405 72462   +91 63819 07438   ✉ ijmrsetm@gmail.com