

## Enhancing Healthcare Data Using Blockchain and Machine Learning

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### ABSTRACT-

Machine learning's ability to understand patterns in data, analyse it, and make judgements has demonstrated its value in a variety of industries. To produce appropriate choices, Machine Learning requires a decent amount of data. Data sharing and data dependability are critical in machine learning to increase accuracy. The Blockchain Technology decentralised database emphasises data exchange. The

### 1.INTRODUCTION

**In machine learning, data is a very important resource. The information** can likewise be utilized in pre-processing methods for further developing exploration conditions. The information can be assembled from interviews, poll, reviews, and studies or created electronically over the web. The quality as well as amount of information further develops effectiveness, characterization and forecast rate in AI. AI models have demonstrated their importance in different areas like medical care, transportation, online business, and promoting. It very well may be utilized for expectation and recognition of sicknesses like malignant growth, diabetes and so on. in health care. As need might arise, the information expanded and information are put away in concentrated servers. These centralized servers' data can be accessed for a fee. This restricts the nature of examination. Data reliability suffers as a result of the failures that also affect the centralized server. Blockchain accompanies decentralized data set without settling on information unwavering quality. In a decentralized database, users can easily access the data. Blockchain innovation is a

Blockchain technology consensus ensures that data is legitimate and secure. The combination of these two technologies can produce highly accurate machine learning results while maintaining the security and reliability of Blockchain Technology. This paper provides an outline of how integrating these two technologies can benefit the healthcare industry.

circulated organization of interconnected hubs. The distributed ledger, which contains the specifics of each and every Blockchain network transaction, is accessible to all nodes. Information can be straightforwardly taken care of into AI models. Blockchain has shown its flexibility and ability past monetary areas.

Blockchain Innovation gained appreciation from Bitcoin digital money which was depicted in Satoshi Nakamoto's whitepaper in 2008. This can be made sense of as, on the off chance that somebody in the Blockchain network starts an exchange. The P2P network, or nodes, will broadcast the transaction. The hubs will approve the exchange. On the off chance that the exchange gets checked, it will be joined with other legitimate exchange to frame a block. The block is set apart with past block's hash and timestamp and will be added to the current Blockchain. The block is extremely durable and unaltered. It has no issue of weak link and there is no focal server to deal with the organization. Blockchain Innovation has gone a long way past bitcoins. Medical care is one of

its application regions. The proposed system was based on bitcoin's strategy of meeting customer information needs and safeguarding patient privacy.

In this proposition on the off chance that the data client necessities to see the record of the patient, they need to pay charge with bitcoins. The detriment of this is abuse of patient's record and paying charges each time makes it troublesome regarding cost. Private Blockchain Networks replaced Public Blockchain Networks in the research. In medical services, many gatherings need to get to same data.

## **2.LITERATURE SURVEY**

### **1. Bitcoin: A Peer-to-Peer Electronic Cash System**

A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure.

#### **PROBLEM STATEMENT:**

In a digital currency system, preventing double spending is crucial. Double spending refers to the act of spending the same digital token or currency unit more than once. In peer-to-peer electronic cash system, ensuring that each unit of currency

can only be spent once is a fundamental problem to solve.

### **2.2 E-Voting with Blockchain: An E-Voting Protocol with Decentralisation and voter Privacy**

Technology has positive impacts on many aspects of our social life. Designing a 24 hour globally connected architecture enables ease of access to a variety of resources and services. Furthermore, technology like the Internet has been a fertile ground for innovation and creativity. One such disruptive innovation is blockchain, a keystone of cryptocurrencies. The blockchain technology is presented as a game changer for many of the existing and emerging technologies/services. With its immutability property and decentralised architecture, it is taking centre stage in many services as an equalisation factor to the current parity between consumers and large corporations/governments. One potential application of the blockchain is in e-voting schemes.

#### **PROBLEM STATEMENT:**

The main reason for using the blockchain in an e-voting protocol is to take advantage of the fact that it enables a group of people to maintain a public database, that is owned, updated, and maintained by every user,

### **3.PROPOSED SYSTEM**

AI can be utilized in recognizable proof of Treatment, give customized idea to Patient, Flare-up Expectation and so on. Client can get sickness outline based on side effects entered. Tokenization, expulsion of stop words and stemming are utilized as pre-processing. SVM classifier, Naive Bayes, and Decision Trees are just a few of the many methods that have been used in this field. The best outcome acquired has the exactness level of 98.51%. The AI calculation can likewise give way of life idea to Patient based on current clinical circumstance and clinical history. The AI models can be prepared to anticipate future

results The agreement in Blockchain innovation ensures that information is genuine and gotten. When these two technologies come together, they can combine the safety and dependability of Blockchain Technology with machine learning to produce highly accurate results. This paper gives an outline of how consolidating these two advances can help in medical care areas

### 3.1 IMPLEMENTATION

**3.1.1 System Framework:** The development of Machine Learning and the popularity of Machine Learning devices, people are gradually getting accustomed to a new era. Blockchain Technology got recognition from Bitcoin cryptocurrency. The block is marked with previous block's hash and timestamp and will be added to the existing blockchain. The block is permanent and unaltered. people (patients) can upload their documents and share these data with doctors (doctor) they like to solve. Doctors can be trained to predict future outcomes. data files are sensitive, Doctors are allowed to choose the patients data with specific people (patients). Clearly, data privacy of the personal sensitive data is a big challenge manage by transaction manager. We gives an overview of how combining these two technologies can help in healthcare sectors. (1) doctor (2) patients (3) transaction manager (4) Admin

#### 3.1.2 DOCTOR

The model can predict outbreak and can give suggestion to the doctor. In healthcare sectors, we use lots of machines and equipment to perform any medical test. Every machine or part of machine has its own life span. It can also predict the need to change/remove the machine or a part of machine. Every authenticated user will have copy of shared ledger. This will resolve data acquisition problem. The machine learning models can be directly fed with data which will be highly reliable and results can be retrieved. The best result

obtained has the accuracy percentage of 98.51%. The machine learning algorithm can also give lifestyle suggestion to Patient on the basis of current medical situation and medical history.

#### 3.1.3 PATIENTS

The model can be trained on the basis of suggestions given to other patients (by doctors) having same problems or symptoms. The Patient can get lifestyle advice. On the basis of Patients symptoms, the trained model can give clinical suggestions to doctors. The model can be trained with real data. This will increase the efficiency and accuracy of models thereby reducing the additional cost to be paid to central authority. If a patient does any basic enquiry regarding his/her health, the trained model with the help of Natural Language Processing can identify the disease as well as give treatment suggestion.

#### 3.1.4 TRANSACTION MANAGER

Every user in the Blockchain network will get an authorized certificate from Certificate Authority. It will be going to provide identity to the user who will going to transact in the network. The identity will be digital certificate. The digital certificate will be used by the user to sign the transaction and submit it to the blockchain. The benefits of signing are: a. Authenticate the blockchain that the user performing or requesting any transaction is a legitimate user. b. Ensuring that user has rights to access the ledger for the transaction they are performing. For instance, Patient will get certificate from the authority. The Patient can access his/her own details but will not be eligible to access the details of other patients. Patient will not be eligible to view details regarding other activities.

#### 3.1.5 ADMIN

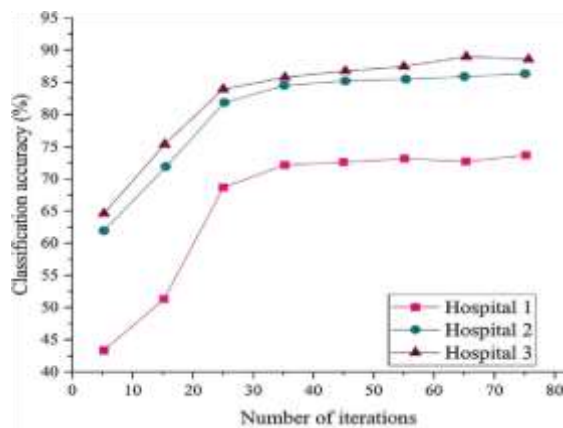
The Admin module serves as the backbone of the healthcare data exchange system by managing user accounts, access permissions, and transaction data.

Admin users are responsible for accepting or rejecting registration requests from doctors and patients, as well as managing access permissions for different users to ensure that patient data is accessed only by authorized parties. The Admin module allows Admin users to view system logs and activity reports, monitor system performance and scalability, and investigate and resolve any disputes related to transactions. Admin users can also generate reports on transaction data for auditing and analysis purposes.

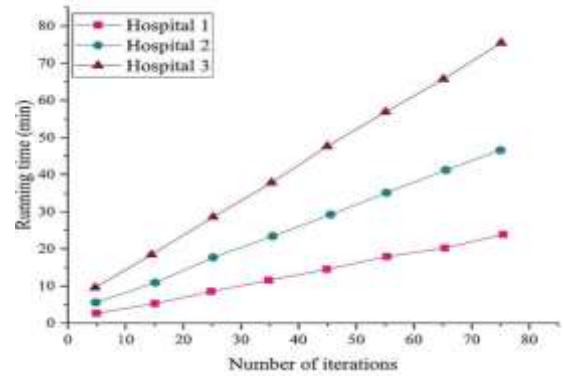
**System Architecture**



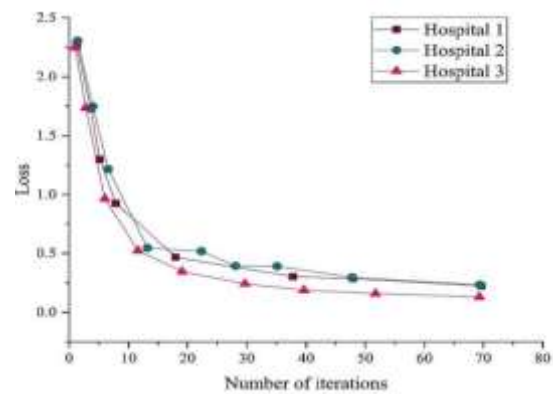
**4.RESULTS AND DISCUSSIONS**



Data set Accuracy from different contributors Using Blockchain and Machine Learning



Time taken



Dataset Loss for different data contributors



Time of Transaction



## 5.CONCLUSION

If used appropriately, blockchain technology provides a plethora of potential that extend beyond bitcoin. The supremacy of central authority, and hence the commission, might be eliminated with blockchain. Machine Learning models can be fed data directly (although the rights will be governed by a central authority). This improves machine learning models' accuracy and efficiency, as well as their usefulness. The healthcare industry is directly related to a person's life. This could benefit both patients and doctors. The real implementation of this paradigm will be available in the future. This methodology can be extended to avoid inventory fraud.

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were indexed IEEE, Springer Link series. He visited the countries Kuching, Malaysia for attending and presenting his research articles. 3 Patent journals are published and in pipeline for grant. He wrote more than an dozen of monographs and published by the Technical Publishers. He Published Two Course content modules for the students of Acharya Nagarjuna University. He is the recognized research supervisor under JNTUK, Kakinada and guided several UG and PG Projects, currently supervising 3 research scholar under JNTUK. His area of interest is Software Engineering, Data Mining, Data Science, Big Data and Programming Languages. He is the Principal Investigator for the DST Sponsored Project and Co-PI for another DST Project. Area of Interest Machine Learning and Blockchain.

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