

Health Care System Using Blockchain and Machine Learning

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ABSTRACT— The power of machine learning in understanding the patterns in data, analyzing and making decisions, has shown its importance in various sectors. Machine Learning requires a reasonable amount of data to make accurate decisions. Data sharing and reliability of data is very crucial in machine learning in order to improve its accuracy. The decentralized database in Block chain Technology emphasizes on data sharing. The consensus in Block chain technology makes sure that data is legitimate and secured. The convergence of these two technologies can give highly accurate results in terms of machine learning with the security and reliability of Block chain Technology. This paper gives an overview of how combining these two technologies can help in healthcare sectors

Keywords— Block chain, machine learning

I. INTRODUCTION

Data is a very important resource in machine learning. The data can also be used in preprocessing techniques for improving research environments. The data can be gathered from interviews, questionnaire, surveys, and studies or generated electronically over the internet. The quality as well as quantity of data improves efficiency, classification and prediction rate in machine learning. Machine Learning models have proved their significance in various sectors like healthcare, transportation, e-commerce, and marketing. It can be used for prediction and detection of diseases like cancer, diabetes etc. in health care. As the growing needs, the data

increased and data is stored in centralized servers. The data in these centralized servers are released at a fee. This limits the quality of research. The centralized server also faces failure issues and hence the reliability of data suffers. Block chain comes with a decentralized database without compromising on data reliability. The data is accessible to users easily in a decentralized database. Block chain technology is a distributed network of interconnected nodes. All the nodes have a copy of the distributed ledger which has the details of every single transaction in the Block chain network. Data can be directly fed into machine learning models. Block chain has shown its adaptability and capability beyond financial sectors.

II. WORKING OF BLOCK CHAIN

As a new transaction is entered, it is then sent over a global network of peer-to-peer computers. The equations are then solved by the network of computers to verify the transaction's legitimacy. They're known as miners. They are grouped together into blocks once their legitimacy has been established. The miner then receives a prize as payment for their efforts. The history of all lasting transactions is then created by chaining together these blocks. The deal has been concluded. The entire process is carried out.

2.1 Block chain features

Block chain is able to add data entries to its database and relies on its own consensus algorithms rather than any centralized body to act

as an arbitrator. Block chain is a highly trustworthy database that is available to everyone. This is a detailed description of each characteristic of block chain technology. Figure 2 displays the Block chain's attributes.

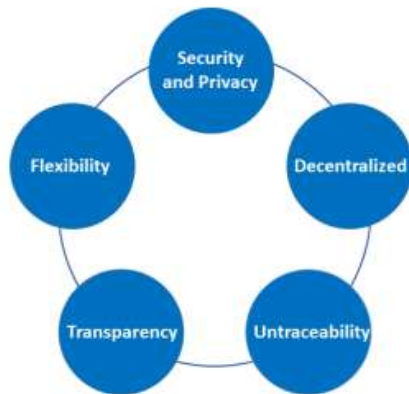


Figure 1: Block chain features

1. Block chain employs cryptography to secure its data for security and privacy. The data is signed using a private key, and using the public key, we can determine if the data has been altered or not and confirm its authenticity. To preserve the security of their data on the block chain, a user should protect their private key by keeping it secret, much like they would their bank's OTP and passwords.
2. Decentralized: No one needs to know or trust anybody else in a decentralized block chain network. A distributed ledger that contains identical data is shared by every member of the network. The majority of the network's members will reject any altered or distorted data from a member's ledger.
3. Untrace ability: A block that has been added to the block chain cannot be altered beyond that point. As a result, if a block is amended in the Block chain, it is immediately rejected or erased.
4. Transparency The participants in a block chain can examine the data, which is entirely public.
5. Flexibility: One of the main benefits of block chain is that it is open source. Users have access to a number of public and private block chains that can be employed depending on the sort of application that has to be constructed.

III. LITERATURE SURVEY

AUTHORS: Satoshi Nakamoto

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. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

AUTHORS: Freya Sheer Hardwick, Apostolos Gioulis, Raja Naeem Akram, and Konstantinos Markantonakis

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 the block chain – a keystone of cryptocurrencies. The block chain technology is presented as a game changer for many of the existing and emerging technologies/services. With its immutability property and decentralized architecture, it is taking centre stage in many services as an equalization factor to the current parity between consumers and large corporations/governments. One potential application of the block chain is in e-voting schemes. The objective of such a scheme would be to provide a decentralized architecture to run and support a voting scheme that is open, fair, and independently verifiable. In this paper, we propose a potential new e-voting protocol that utilizes the block chain as a transparent ballot box.

IV. PROPOSED SYSTEM

Machine Learning can be used in identification of Treatment, give personalized suggestions to Patient, Outbreak Prediction etc. Users can get disease summary on the basis of symptoms entered. Tokenization, removal of stop words and stemming are used as preprocessing. Many techniques have been done in this area which include SVM classifier, Naive Bayes and Decision Trees. The best result obtained has the accuracy

percentage of 98.51%. The machine learning algorithm can also give lifestyle suggestions to patients on the basis of current medical situation and medical history. The machine learning models can be trained to predict future outcomes. The consensus in Block chain technology makes sure that data is legitimate and secured. The convergence of these two technologies can give highly accurate results in terms of machine learning with the security and reliability of Block chain Technology. This paper gives an overview of how combining these two technologies healthcare sectors

V. SYSTEM ARCHITECTURE



Figure 2: Architecture of HEALTH CARE SYSTEM USING BLOCKCHAIN

VI. RESULT

The Blockchain Technology improves the efficiency of detecting the fake products and by using logo detection there is an improvement of tampering the Logo. Below are the output of the fake product detection using logo detection using image processing and blockchain.



Figure 3: Home Page



Figure 4: Doctor Registration Page



Figure 5: Patient Registration Page



Figure 6: Admin Login Page



Figure 7: Admin Home Page



Figure 8: Patient Activation Page

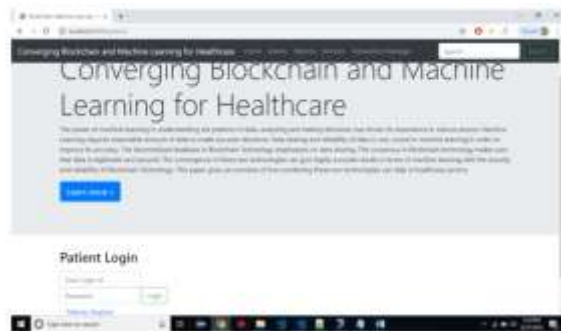


Figure 10: Patient Login Page



Figure 11: Patient Home Page



Figure 12: Prescription Page

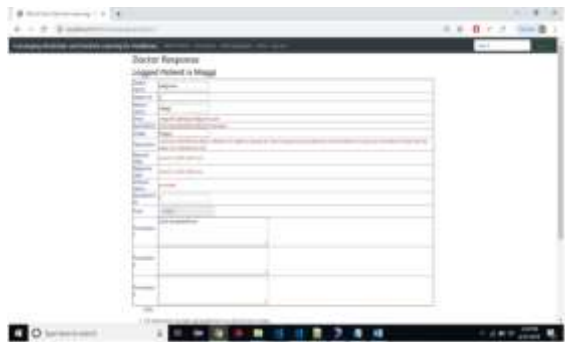


Figure 13: Doctor Response Page



Figure 14: Patient Transactions Page



Figure 15: Doctor Login Page



Figure 16: Doctor Home Page



Figure 20: Admin View Transactions Page

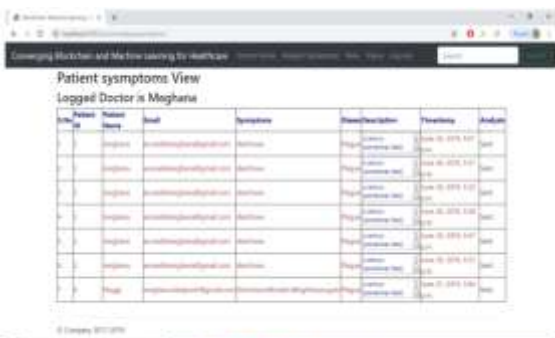


Figure 17: Analyze Symptoms Page

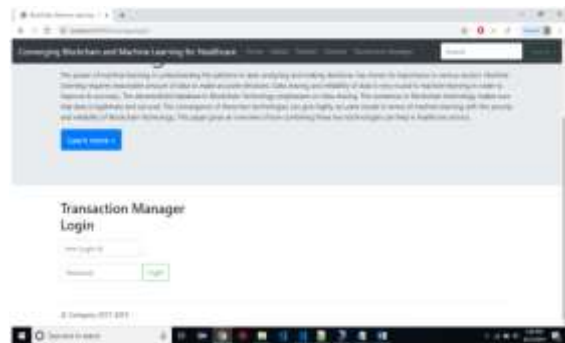


Figure 21: Transaction Manager Page

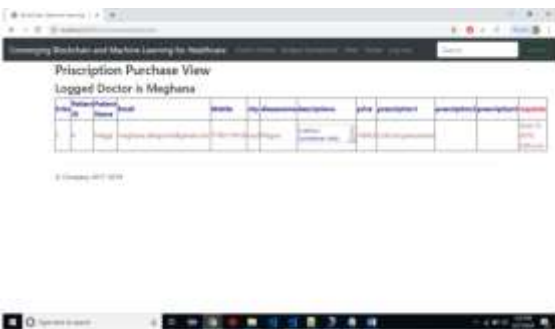


Figure 18: View Page



Figure 22: View Transactions Page:



Figure 19: Transactions Page

VII. CONCLUSION

Block chain Technology gives a great number of opportunities if utilized properly and is seen beyond bitcoin. With block chain, the dominance of central authority could be eliminated and so the commission. Machine Learning models can be directly fed with data (however the rights will be managed by central authority). This will increase the accuracy and efficiency of machine learning models and so their usability. Healthcare industry directly correlates with the life of a person. This could help patients as well as doctors. In terms of future scope the practical implementation of this model will be there. This model can be further extended for Inventory to prevent fraud.

VIII. ACKNOWLEDGEMENT

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