International Journal of Scientific Research in Science, Engineering and Technology
Print ISSN: 2395-1990 | Online ISSN : 2394-4099 (www.ijsrset.com)
doi : https://doi.org/10.32628/IJSRSET

Blockchain Based Data Security and Privacy for Internet of Things Enabled Health Care System

Dr. S. Nirmala [1], Dr. M. Jeyaselvi[2], Mr. Shivananda. S [3], Dr. M. Sathya [4], Ms. Pavithra. A[5]
*[1]Professor, Department of CSE, AMC Engineering College, Bangalore, Karnataka, India
[2]Assistant Professor, Department of Networking & Commnuications ,
SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India
[3]Assistant Professor, Department of ISE , AMC Engineering College , Bangalore, Karnataka, India
[4] Associate Professor, Department of ISE , AMC Engineering College , Bangalore, Karnataka, India
[5] Assistant Professor, Department of ISE , AMC Engineering College , Bangalore, Karnataka, India

Article Info
Volume 9, Issue 1
Page Number : 302-307

Publication Issue :
January-February-2022

Article History
Accepted : 20 Jan 2022
Published: 28 Jan 2022

ABSTRACT

The major purpose of this research is to gather data on access control from end-users of an electronic medical record (EMR) and, with their aid, create a list of workable access control rules and models that are more closely matched with user needs and workflows. One of these topics is the Electronic Health Record (EHR) and, as a result, the desire for a universal EHR. In this industry, access management is a conundrum: how to keep patients' sensitive health information secure while making it accessible to any or all sectors of interest, all while adhering to federal privacy regulations set by our government. The goal of this research is to create a single electronic health record (EHR) that contains all of a patient's medical information for all areas of care.

Keywords : Electronic Medical Record, Electronic Health Record, Patients, Privacy, Care

I. INTRODUCTION

In many regions of the world, life expectancy has gradually increased in recent decades, resulting in a rapid increase in the count of elderly individuals. According to a recent projection by a global organization, two billion senior persons (22 percent of the world's population) would exist by 2050. Furthermore, roughly 89 percent of the elderly are unable to measure independently, according to study. However, medical research studies show that more than 80% of those over 65 have at least one chronic illness, making it difficult for many older people to care for themselves. As a result, ensuring the elderly have a high quality of life has become a major social priority at the time. The growing boom in data and communication technology enables innovative utility solutions and tools that hold promise in addressing the above challenges.

The Internet of Things (IoT) has quickly become one of the most important communication paradigms of the 21st century. All devices in our daily lives become a part of the internet in the IoT ecosystem due to their connectivity and processing capability (including microcontrollers, transceivers for digital

communication). The Internet of Things (IoT) broadens and expands the concept of the internet. IoT allows for seamless communication across a variety of devices, including medical sensors, surveillance cameras, and domestic appliances. As a result, the Internet of Things (IoT) has become more productive in a variety of fields, including the attention system. In healthcare, the Internet of Things (IoT) refers to a number of low-cost sensors (wearable, implanted, and environmental) that enable older individuals to access current medical healthcare assistance at any time and from any location.

II. LITERATURE REVIEW

In a project report, a literature survey or literature review presents the numerous studies and research done in the topic of interest, as well as the results already published, while taking into account the project's many aspects and scope.

The following items are included in a literature review:

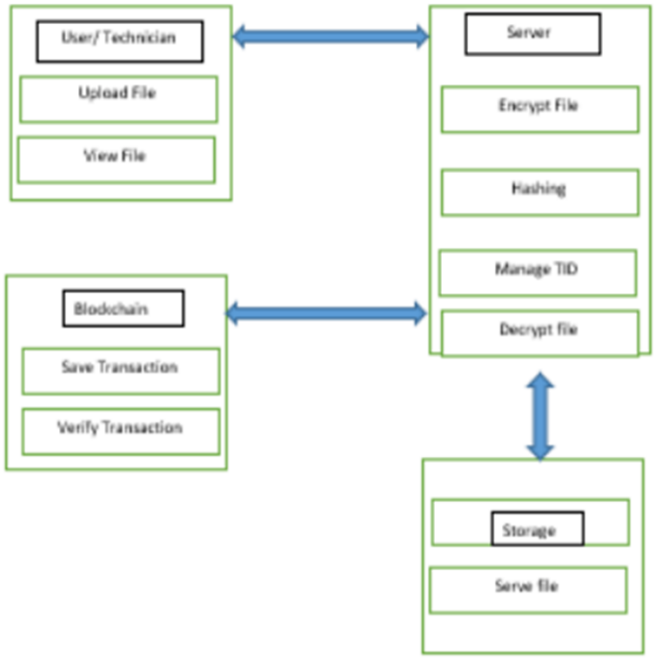
- Universally recognized theories on the subject already exist.
- Books on the subject, both general and specific
- Field research is usually done in the sequence of oldest to most recent.
- Current challenges and ongoing projects, if applicable.

The existing work on the project is described in the literature survey. It addresses the issue with the current system and also provides users with a clear understanding of how to cope with existing difficulties and suggest solutions to them. In order to protect the EMR/EHR/PHR theme and secure the privacy and integrity of the data, many methods were created in the current system. Victimization scientific primitives, like as those that support public key infrastructure and public clouds, are used in ways to protect data confidentiality and privacy. Before being transferred to the cloud, data is encrypted, for instance. However, this restricts the search ability of the data since health-care professionals must rewrite the (perhaps enormous) data before looking at the decrypted data, thereby increasing the time and expense of data retrieval and classification (e.g., download, decrypt, and search). This patient information is vulnerable to a variety of assaults, and these data are under the complete control of the hospital administration.

III. PROPOSED METHODOLOGY

A secure IoT-based tending system that uses blockchain to ensure that those standards are met as efficiently as possible. One of the most important features of any system is security. Because people have such diverse perspectives on security, it is defined in a variety of ways. In general, security could be construed as the overall security of the system. In the patient network, a replacement block is created and distributed to all or some of the peers (blockchain nodes). The system can introduce a new block into the chain if a majority of peers have authorized it. This allows North American nation to obtain a global read of the patient's anamnesis in a timely, accurate, and permanent manner. If an agreement cannot be reached, a fork in the chain is produced, and the block is labelled as an orphan, as it does not belong to the most chain. The information in any given block cannot be modified without affecting all subsequent blocks once it has been added into the chain. Modification is merely identified, in other words. Because block content is publicly visible, the data must be secured prior to the information being contained within the block.

IV. PROPOSED MODEL



Architecture Diagram

V. IMPLEMENTATION

The implementation Innova develops the specific materialization of the ideas provided in the analytical document and produced in the planning section. In order to get the required final output, implementation should be a perfect mapping of the design document into an extremely appropriate artificial language. Typically, the product is harmed due to a bad programming language or a bad development process. It's preferable for the cryptography phase to be directly connected to the design phase, because if the design is object-oriented, then the implementation should also be object-oriented.

The implementation involves:

1. Thorough planning.
2. Research into this system and, as a result, the implementation limits.
3. Employee training within the newly designed system.

The implementation of associated computer code is always preceded by crucial decisions on the platform to be utilized, the language to be used, and so on. Many factors influence these decisions, including the $64000 environment in which the system operates, the needed speed, security considerations, and other implementation-specific issues. There are three important implementation decisions that must be made prior to the start of this project.

The following is a list of them:

1. The platform of choice (Operating System).
2. Selection of an artificial language for the application's event.
3. Follow the cryptography pointers.

Humanoid Studio turned into used to create the person interface that is the client-facet. The respectable incorporated improvement environment (IDE) for the humanoid platform is humanoid Studio. NetBeans is used to finish the server facet of the implementation. NetBeans is a Java-primarily based totally laptop code improvement platform. The NetBeans Platform allows the advent of packagesfrom a fixed of well-known software program additivesreferred to as modules. Third-celebration builders often amplify NetBeans Platform packages in addition to the NetBeans incorporated improvement environment (IDE). The NetBeans IDE is mostly designed for Java programming, however it additionally helps different languages, opportunity languages, specially PHP, C/C++, and HTML5.

VI. RESULTS

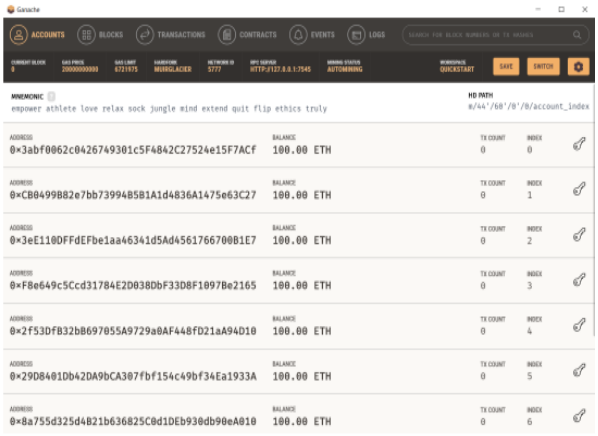


Fig 6.14: Ganache

Description: to gain access to the blockchain we use Ganache which provides key to Ethereum

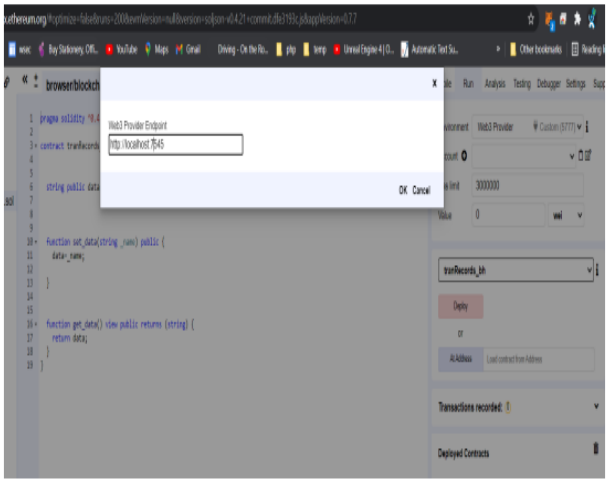


Fig 6.15: Connecting remix with Ganache

Description: by connection to the Ethereum remix we can get link from blockchain to localhost

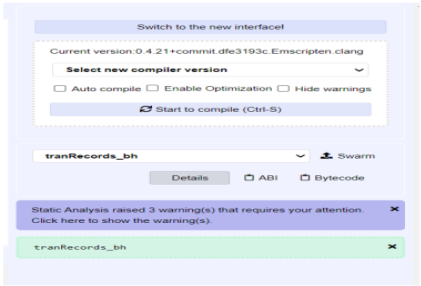


Fig 6.16: Compile the smart contract

Description: this is the smart contract provided to the user from the blockchain website

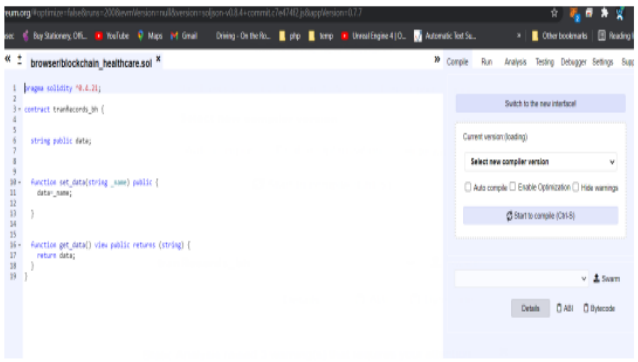


Fig 6.17: Smart Contract

Description: this is a smart contract which connects the application to the Ethereum blockchain

VII. CONCLUSION

This research presented the planning and implementation of an association blockchain-based off-chain storage mechanism for patient report. Solely hashes of reports are keep within the blockchain for scalability. The planned model is totally decentralized in nature in contrast to the presently obtainable centralized storage mechanism for information sharing among attention providers.

VIII. REFERENCES

[1] Felpie Grialva, Vanessa Regina, Laurindo Britto Neto Lima, Margareth "A kinect-based wearableface recognition system to benefit visually challenged users," Malike, Luiz Cesar Martini, and Dinei Florencio.

[2] "Cross modality face recognition through heterogeneous joint Bayesian," IEEE, Hailin Shi, Xiaobo Wang, Dong Yi, and Zhen Lei.

[3] Jian Yang, Lei Luo, Jianjin Qian, Ying Tai, Fanlong Zhang, and YongXu, "Nuclear normbased matrix regression with applications to face recognition with occlusion and illumination changes," in Jian Yang, Lei Luo, Jianjin Qian, Ying Tai, Fanlong Zhang, and YongXu, "Nuclear norm-based matrix regression with applications to face recognition with occlusion and

[4] Jinwoo Kang, David V. Anderson, and Monson H. Hayes, “Face recognition for vehicle personalization with near infrared frame differencing,” IEEE.

[5] S. Nishanthini, M. Abinaya, and Dr. S. Malathi “smart video surveillance system and alert with image capturing using android smart phones,” in International Conference on Circuit, Power and Computing Technologies ICCPCT], p. 201.

[6] Alpika Gupta and Dr. Rajdev Tiwari, “Face detection using modified viola Jones algorithm,” March, International Journal of Recent Research in Mathematics Computer Science and Information Technology, vol. 1,no. 2, pp. 59–66, Month: October 2014 – March.

[7] G. Sabarmathi and R. Chinnaiyan, "Investigations on big data features research challenges and applications," 2017 International Conference on Intelligent Computing and Control Systems (ICICCS), Madurai, 2017, pp. 782-786.

[8] G. Sabarmathi and R. Chinnaiyan, "Reliable Machine Learning Approach to Predict Patient Satisfaction for Optimal Decision Making and Quality Health Care," 2019 International Conference on Communication and Electronics Systems (ICCES), Coimbatore, India, 2019, pp. 1489-1493

[9] Hari Pranav A;M. Senthilmurugan;Pradyumna Rahul K;R. Chinnaiyan , "iot and Machine Learning based Peer to Peer Platform for Crop Growth and Disease Monitoring System using Blockchain," 2021 International Conference on Computer Communication and Informatics (ICCCI), 2021, pp. 1-5, doi:

[10] Preetika B, ; M. Latha; M. Senthilmurugan; R. Chinnaiyan, , "MRI Image based Brain Tumour Segmentation using Machine Learning Classifiers," 2021 International Conference on Computer Communication and Informatics (ICCCI), 2021, pp. 1-9, doi: 10.1109/ICCCI50826.2021.9402508.

[11] Balachandar S., Chinnaiyan R. (2019) Reliable Digital Twin for Connected Footballer. In: Smys S., Bestak R., Chen JZ., Kotuliak I. (eds) International Conference on Computer Networks and Communication Technologies. Lecture Notes on Data Engineering and Communications Technologies, vol 15. Springer, Singapore

[12] Balachandar S., Chinnaiyan R. (2019) Centralized Reliability and Security Management of Data in Internet of Things (IoT) with Rule Builder. In: Smys S., Bestak R., Chen JZ., Kotuliak I. (eds) International Conference on Computer Networks and Communication Technologies. Lecture Notes on Data Engineering and Communications Technologies, vol 15. Springer, Singapore

[13] S.Balachandar , R.Chinnaiyan (2018), Centralized Reliability and Security Management of Data in Internet of Things (IoT) with Rule Builder, Lecture Notes on Data Engineering and Communications Technologies 15, 193-201.

[14] S.Balachandar , R.Chinnaiyan (2018), Reliable Digital Twin for Connected Footballer, Lecture Notes on Data Engineering and Communications Technologies 15, 185-191.

[15] S.Balachandar , R.Chinnaiyan (2018), A Reliable Troubleshooting Model for IoT Devices with Sensors and Voice Based Chatbot Application, International Journal for Research in Applied Science & Engineering Technology,Vol.6,Iss.2, 1406-1409.

[16] M. Swarnamugi ; R. Chinnaiyan, “IoT Hybrid Computing Model for Intelligent Transportation System (ITS)”, IEEE Second International Conference on Computing Methodologies and Communication (ICCMC), 15-16 Feb. 2018.

[17] M. Swarnamugi; R. Chinnaiyan, “Cloud and Fog Computing Models for Internet of Things”, International Journal for Research in Applied Science & Engineering Technology, December 2017.

[18] G Sabarmathi, R Chinnaiyan (2019), Envisagation and Analysis of Mosquito Borne Fevers: A Health Monitoring System by Envisagative Computing Using Big Data Analytics, Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT, volume 31), 630-636. Springer, Cham

[19] S. Balachandar, R. Chinnaiyan (2019), Internet of Things Based Reliable Real-Time Disease Monitoring of Poultry Farming Imagery Analytics, Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT, volume 31), 615- 620. Springer, Cham

[20] M Swarnamugi, R Chinnaiyan (2019), IoT Hybrid Computing Model for Intelligent Transportation System (ITS), Proceedings of the Second International Conference on Computing Methodologies and Communication (ICCMC 2018), 802-806.

[21] G. Sabarmathi, R. Chinnaiyan (2016) , Big Data Analytics Research Opportunities and Challenges - A Review, International Journal of Advanced Research in Computer Science and Software Engineering, Vol.6 , Issue.10, 227-231

[22] G. Sabarmathi, R. Chinnaiyan, Investigations on big data features research challenges and applications, IEEE Xplore Digital LibraryInternational Conference on Intelligent Computing and Control Systems (ICICCS), 782 – 786.

Cite this article as :

Dr. S. Nirmala, Dr. M. Jeyaselvi, Mr. Shivananda. S, Dr. M. Sathya, Ms. Pavithra. A, "Blockchain Based Data Security and Privacy for Internet of Things Enabled Health Care System", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 9 Issue 1, pp. 302-307, January-February 2022.
Journal URL : https://ijsrset.com/IJSRSET229156