International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

A Secured Blockchain Database Management Model for Medical Based Organization

Irikefe Friday Eti[1], Kizito Eluemunor Anazia[2], Vivian Onyinye Okeke[3], Febau Cyril Benafa[4] and Orugba Kenneth[5]

1, 2, 4, 5: Department of Information Systems and Technology, Southern Delta University, Ozoro.
3: Department of Computer Science, Federal College of Fisheries & Marine Technology, Lagos, Nigeria

Date of Submission: 05-05-2025 Date of Acceptance: 15-05-2025

ABSTRACT
The implementation of an Electronic Health Record (EHR) management system has proven to be an effective alternative to the traditional manual method of handling medical records. However, concerns about data privacy and security persist in the healthcare sector, particularly due to the outdated centralized database systems that have failed to meet modern expectations.To address this, a secured blockchain database management model for medical based organization is designed for healthcare organizations, emphasizing a patient-centered approach. This model efficiently handles and maintains individuals' health records using blockchain technology. Developed based on object oriented analysis and design methodology, the system was built using Visual Studio Code (VS Code), PHP, the Ethereum network, Web3.js, and Ganache.Blockchain technology provides the foundation for decentralizing patient information and ensuring secured data storage. Smart contracts arecritical in protecting patient privacy and data integrity by facilitating secured transactions, each modification is verifiable and propagated across the network. To further enhance the model's security and integrity, a cryptocurrency wallet such as MetaMask is integrated, offering a centralized yet secure repository for medical records that authorized users like patients and healthcare providers can access anytime.By providing a robust platform for securely managing data with customizable access permissions and enabling the safe exchange of patient records, this blockchain-based system surpasses legacy systems in efficiency, reliability, and accessibility in the healthcare domain

Keywords: Electronic Health Record, Blockchain, Ethereum, Anonymization, Cryptocurrency and Security Management.

I. INTRODUCTION

A core element of human life is the well-being of individuals and communities, often captured by the phrase "health is wealth." This implies a direct link between a society's socioeconomic development and the health status of the individuals and groups within it. Healthcare systems play a crucial role in improving quality of life and fostering societal welfare, and they are widely recognized as both indicators and drivers of economic growth. Due to their expanding significance in social investments and national economies, healthcare schemes have become central to political and financial discourse [1].

As the demand for efficiency and effectiveness in healthcare continues to rise, longstanding debates around the roles of public and private sectors in the delivery of healthcare goods and services remain relevant. Within this context, extensive research and reforms in various countries have generated a substantial body of knowledge that contributes to inform policymaking and improved governance in health system [2].

One key aspect of healthcare that continues to draw national and global attention is the management of health information. In the 21st century, health data is critical for effective treatment and long-term service delivery. It holds medical, economic, and privacy significance. Patients with health conditions are often at risk of discrimination and stigmatization, making the protection of their medical records a matter of serious concern [4]. As a result, personal health

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

records are treated as highly sensitive and must be safeguarded against unauthorized access.

While patients and their doctors must have unrestricted access to medical records, external parties such as insurance companies, educational institutions, and government agencies may occasionally require access for legitimate purposes. Ensuring that only authorized entities receive this information, without breaching confidentiality, is a major responsibility of health information management professionals. Their role is essential in protecting sensitive data from unauthorized use and potential harm [5].

Information is a fundamental driver of organizational efficiency and innovation. Accurate data enables better planning and decision-making, which is why data collection is critical for all institutions [6]. The growing volume of structured, semi-structured, and unstructured data that are found in the public domain underscores the necessity for robust and strategic data management practices that enable meaningful analysis and insight [7].

Technological advancements across the globe have improved health outcomes by enhancing access to health information and expanding service delivery. According to reports, United States, for example, electronic health records have become a central component of national healthcare policy [8]. The digital era has led to an exponential increase in health-related data, sourced from electronic medical records, imaging technologies, wearable devices, and genetic sequencing. This collection of vast and diverse data referred to as big data holds the potential to transform healthcare by supporting advanced analytics, personalized treatment, and improved patient care [9].

Big data also enables predictive analytics, using electronic data such as lab results, imaging reports, and disease-specific information to forecast health outcomes. With the shift withinthe medicalrelated industry from a volume-based to a value-based care model, data becomes increasingly important in guiding patient care decisions and controlling associated costs, including those related to insurance. The value-based model emphasizes the improvement of care quality through predictive and evidence-based decision-making [10].

According to [11], maintaining user privacy and ensuring the confidentiality of big data are key concerns in health information management. Privacy in this context refers to protecting personally identifiable health information generated fromunapproved access or misuse. Although availability and integrity are often discussed, the primary focus is the security of data/information within the healthcare sector to prevent data breaches and protecting against illegal use [12].

Healthcare providers store, manage, and exchange large volumes of data to improve service delivery. However, this also introduces vulnerabilities, particularly when attackers use data mining techniques to uncover and publicly expose sensitive information. Despite efforts to enhance security, challenges persist, especially as cybersecurity threats become more sophisticated [13]. Therefore, healthcare organizations must implement comprehensive security systems that protect essential data, ensure compliance with legal standards to detect and prevention threats from cyber-attacks. Existing systems often fail to prevent breaches involving patient data such as biometric, medical, insurance, and financial information leaving individuals exposed. This highlights the urgent need for advanced big data security frameworks to uphold the confidentiality and protection of information in healthcare organizations [14].

II. REVIEW OF RELATED LITERATURE

The integration of electronic health records systems has significantly modernized healthcare information management by improving access to patient histories. This advancement supports more accurate diagnoses and better-informed treatment decisions by allowing healthcare professionals to reference a patient's medical background over time [15]. It has shown that the development of web-based hospital management systems further enables remote access to patient data, making it possible for physicians in different locations to provide care, irrespective geographic location of the patient [16].

A broad survey of EHR applications was conducted by [17], covering their use in disease, monitoring, diagnosis and treatment optimization. The study also emphasized the importance of EHRs in building clinical decision support systems. While the challenges faced during the implementation work, it was pointed that the conceptual and practical deployment was poorly done.In a related study, [18] introduced a user-friendly EHR platform that used a novel phenotypic term-binding method to improve healthcare delivery and disease prediction. This system allowed patients to register and interact with their records, while healthcare workers played important role during updating and

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

using the data. However, [20] noted the lack of automated disease prediction features, which would further enhance clinical decision-making.

Security in EHR systems has also received considerable attention. In the work of [21], they proposed a biometric authentication system to safeguard patient data, effectively reducing False Rejection and Acceptance Rates, thereby achieving a balance between security and usability. Complementing this, [22] argued for meaningful EHR integration to foster collaboration among providers, improve the care of patients and reduce healthcare costs. Their qualitative research focused on physicians' experiences with EHR systems.

Further exploring technological integration, [23] implemented RFID technology in Saudi hospitals for effectivesupervision of medical files. According to [24], this approach enhanced data accuracy, operational efficiency, and healthcare outcomes by streamlining record-keeping.

In a multi-site clinical trial, [25] tested the iCPR tool; a modelwith a focus on system usability and staff training. Meanwhile, [26] examined hospital administrative challenges and highlighted why digital transformation is needed in improving operational efficiency. They recommended automated systems for managing patient records, discharges, and error-prone manual processes [27].

Efforts to improve hospital workflow were evident in [28], where a web-based Patient Management System was developed to resolve management inefficiencies. Security was a priority, with user authentication ensuring controlled access to classified and delicateinformation. Similarly, [29] proposed aweb basedclinical management platform to address data redundancy and replace paper-based records. However, scalability limitations emerged due to a rigid search structure [30].

Also [31] proposed a comprehensive hospital database management system suited for use in clinics, dispensaries, and labs. It allowed seamless information exchange between facilities and supported secure access to patient records across institutions [32].

During emergencies, real-time communication between hospitals and emergency services is essential. It was emphasized by [33] that there isnecessity for healthcare facilities to recognize and share their resource availability, such as staff and beds. Web-based systems were also found to reduce administrative paperwork and streamline patient management, appointments, and prescriptions [34].

In the work designed by [35], they introduced a user-accessible hospital management system designed to be available irrespective of the patient's location. The system allowed administrators to manage patient and physician data efficiently while ensuring data protection through restricted access [36].

In an integrated model proposed by [37], clinical management features were combined with disease prediction tools and QR code generation for patients. In order to resist malware and ensure safe user interaction, enhanced security protocols were also used [38].Also [39] stressed the need to replace manual hospital record-keeping with secure digital systems, incorporating features like patient registration, pharmacy management, and billing. Despite missing functionalities such as expiry alerts and asset tracking, the system represented a foundational step toward digital healthcare transformation [40].

Finally, [41] developed a fully homomorphic encryption algorithms to store, manage and secure healthcare related information in the cloud. Using fixed-point binary and rational number formats, the model were experimentally validated with image processing techniques like Fast fourier transform and histogram of oriented gradients. However, accuracy was influenced by format-related errors [42].

III. METHODOLOGY

A methodology serves as an organized set of techniques and processes used within a specific discipline to guide the planning, analysis, design and deployment of a project. In the realm of software development procedures, the choice of a suitable methodology is determined by several factors, including the nature of the problem, the type and structure of data, the development environment, and project-specific goals. For the design and implementation of a robust blockchain-based electronic health record management system, the object-oriented analysis and design methodology is considered most appropriate. This methodology leverages object-oriented concepts to represent the system as a collection of interrelated objects, allowing for modularity, reusability, and scalability, key attributes required for developing complex, secure systems like blockchain-enabled EHR platforms.

3.1. Analysis of the System

The secured blockchain-based database management model for medical organizations demonstrates significant improvements over the

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

existing system by replacing traditional relational databases with a decentralized architecture built on Ethereumand the interplanetary file system**.** This new model enhances data security, integrity, and privacy, addressing the limitations of conventional systems. The system will feature an interactive, user-friendly interface designed to deliver an excellent user experience (UX). It will support patient registration, real-time data capture, and data synchronization, all while enforcing strong security measures to maintain confidentiality and privacy. A robust access control mechanism will ensure that sensitive patient's medical information is restricted to authorized individuals, malicious actors, and harmful software, in alignment with blockchain security and confidentiality standards. The development of the secured blockchain database management modelwas done using HTML, PHP, CSS, and React.

3.2. Architecture of the System

As outlined earlier, the system is an enhanced health record management platform designed to provide an outstanding user experience (UX) while ensuring the highest standards of security, privacy, and confidentiality. It is built to avertunlawful access and to make sure that data remains protected from malicious interference. The system maintains the core elements of the existing system but upgrades the relational database to a blockchain-based Ethereum ledger, coupled with the interplanetary file system for improved decentralization and security. Furthermore, a data visualization framework is integrated to facilitate better decision-making and user engagement. The diagram below presents the architecture of the system.

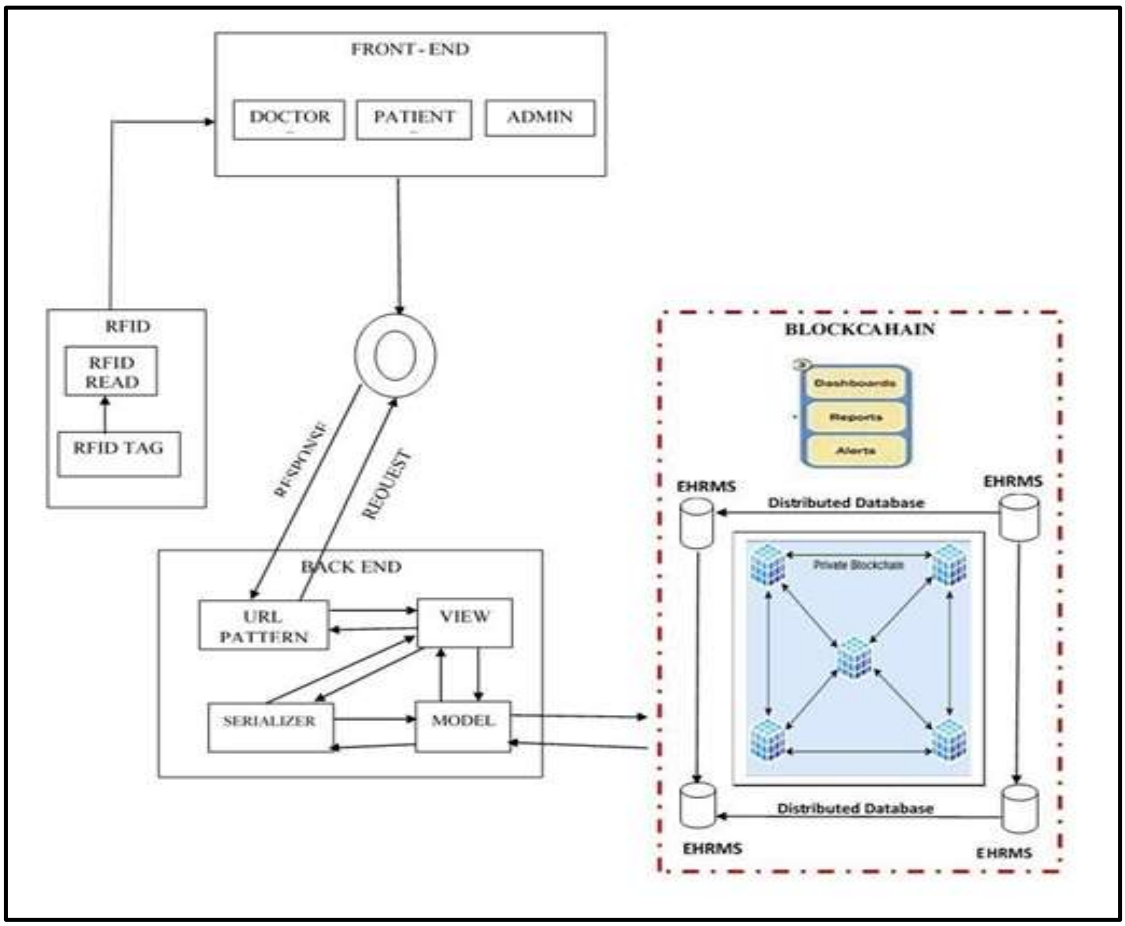

Figure 1: Architecture of the System

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

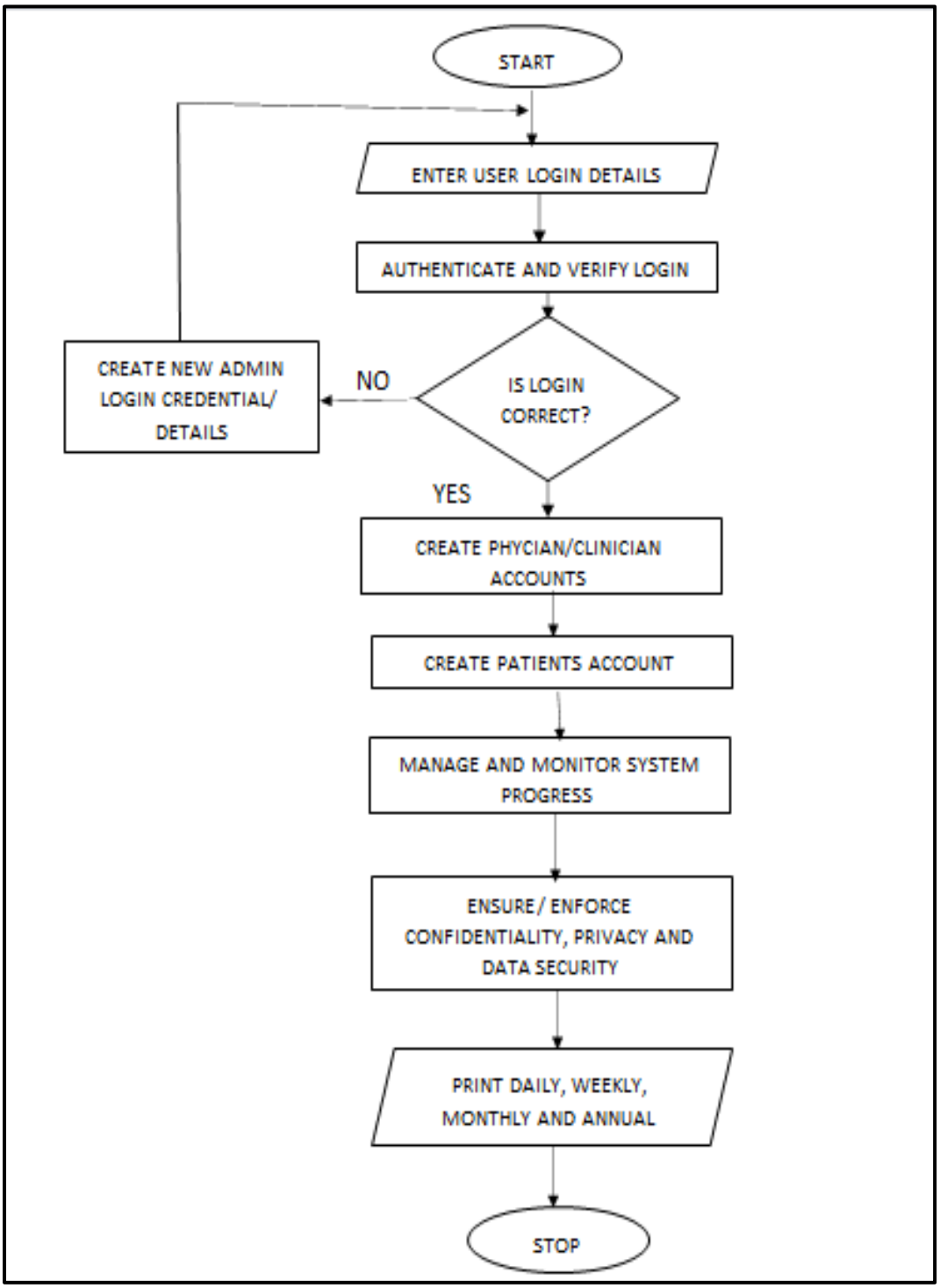

Figure 2: Admin Flowchart

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

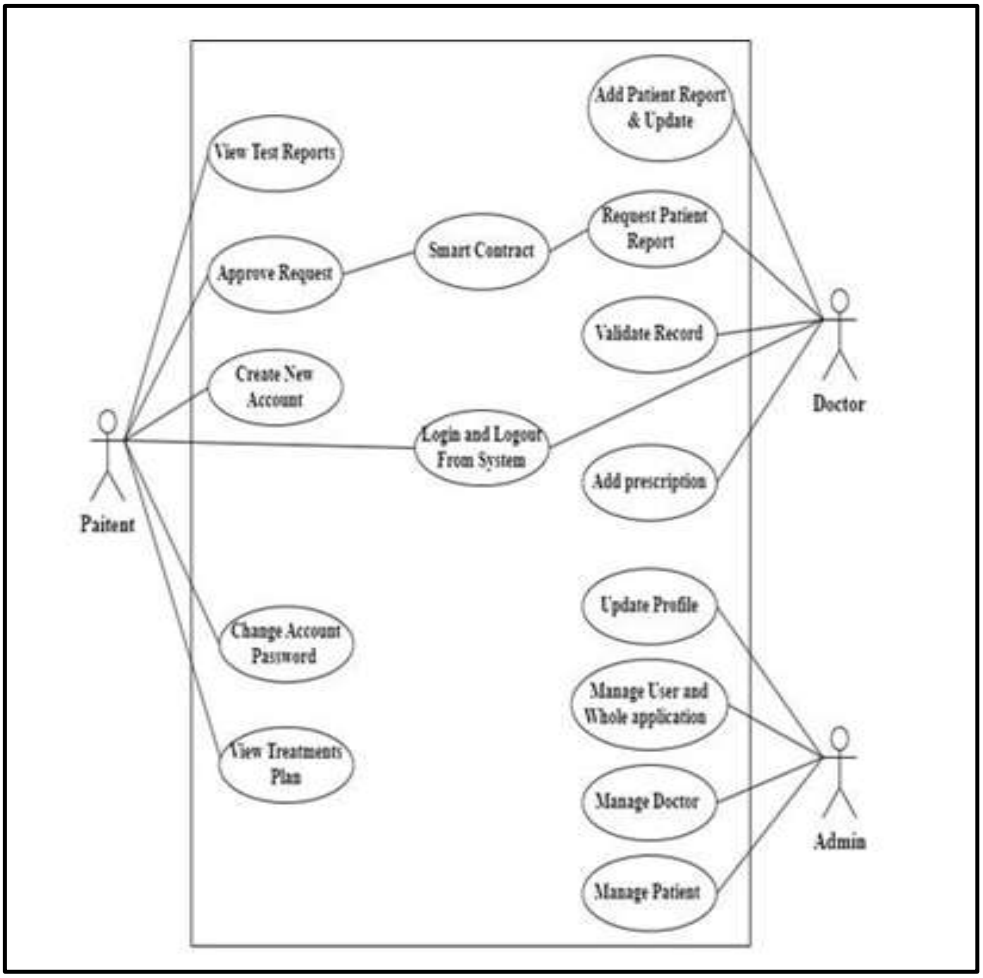

Figure 3: UML Case Diagram of the System

3.3. System Requirement

Given that a system is defined as a collection of dependent and interdependent components working together to achieve specific objectives, it is vital to ascertain the critical components that are very important effectiveness and functionality of system. The requirements ofsecured blockchain database management modelare as follows:

Hardware Requirement

i. Intel Core i5 6th generation processor with a minimum 3.3 GHz speed or higher. An Advanced Micro Devices processor AMD FX-4300 with 4.7 GHz can also suffice.
ii. Between 4GB to 8GB RAM or higher.
iii. A minimum of 320GB to 500GB respectively or higher of Hard Disk Drive (HDD)
iv. The minimum requirement for laptops should be Intel(R) HD Graphics 3000 or higher.
v. Input/ Output Devices are microphones and speakers.

Software Requirement

The recommended system requirements include Windows 7 Service Pack 1 or later, along with Microsoft .NET Framework 4.1 for optimal performance, Ganache, Web3, Truffle, and Node Package Manager (npm), Next.js, Ethereum, Hypertext Preprocessor (PHP), React, CSS, and JavaScript..

IV. RESULTS AND DISCUSSION

The secured blockchain-based database management model for healthcare organizations involves the development of a web-based application for an Ethereum-based electronic health records system, built using the Next.js web framework. This application is fully integrated with the Ethereum blockchain, ensuring the highest level

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

protection of patient medical information through secure, transparent transactions. The system employs Web3, utilizing the hypertext transfer protocol to establish a connection with the Ethereum network via an Ethereum node, which runs locally on the ETH wallet. Additionally, the MetaMask browser extension facilitatedthe Ethereum account management, further enhancing integration with websites.

Within this system, each activity and transaction is linked to specific aspects of medical history of the patient, such as hospital visits, administrative records, diagnostic reports, treatment details, physician's notes, lab results, prescriptions, and other patient-centric information that require strong privacy and integrity of the information. Medical practitioners and doctors can access patient data once patients grant permission, typically through appointment scheduling for routine visits via the web portal. The system is made up of three key modules, which include:

i. The user management module
ii. The electronic health record storage module
iii. The Human activity recognition view layer module

4.1. User Management Module

User management layerthe first modulesecured blockchain database management model, which serves as the interface for the patients and doctors to interact with the electronic health record system. This module allows users to input and retrieve data which is securely stored in decentralized storage. It also displays various buttons for navigating to different sections of the system, allowing users to perform a range of tasks. Notably, the registration button is provided for new users to sign up and given access to all the healthcare services packages offered by the hospital. Additionally, there is a button that enables users to connect to the Ethereum blockchain**,** granting them access to data stored on the blockchain. As shown in figures 4 and 5 below,illustrate two states of the system's home page: one without a wallet connection and one with the wallet connected, showing the wallet address.

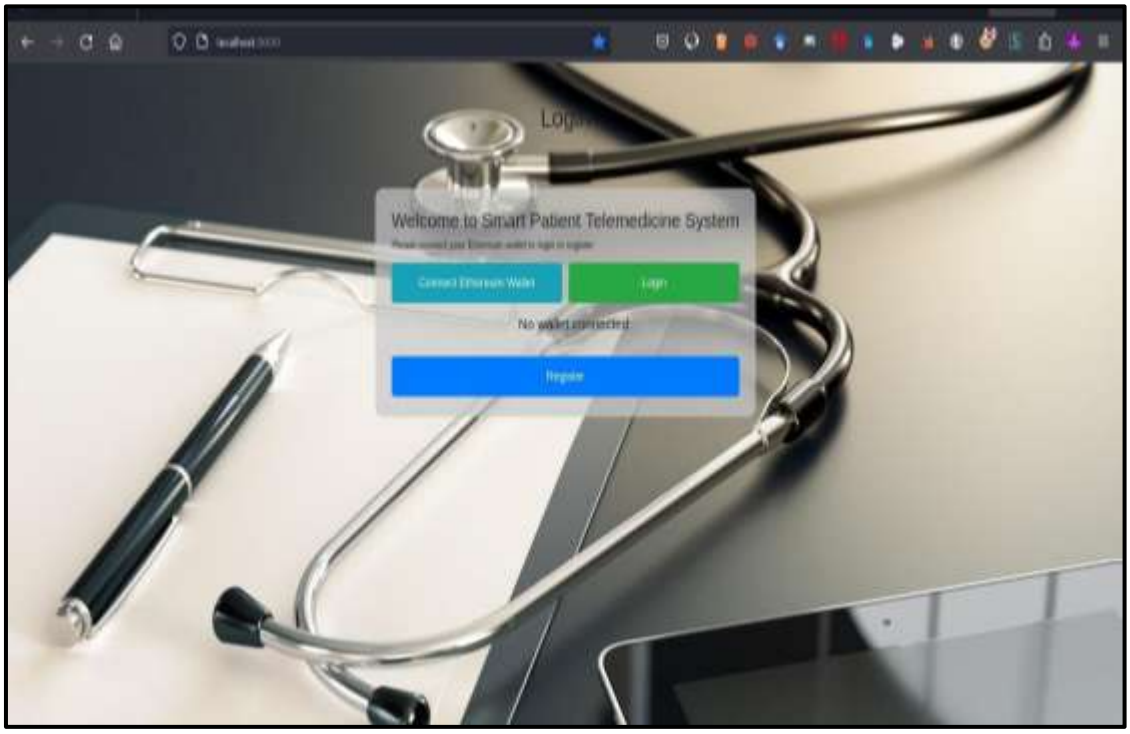

Figure 4: Home page showing no wallet connection

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

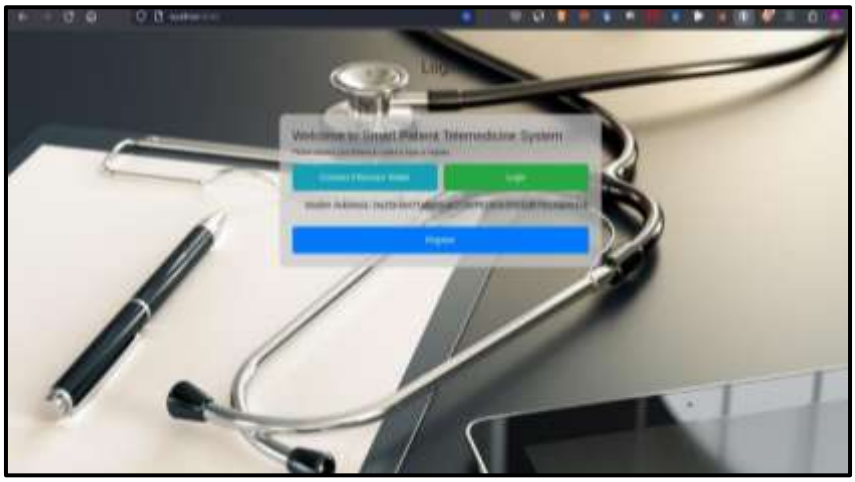

Figure 5: Home Page showing connection and wallet address

4.2. Storage Module

The second module is the secured blockchain database management modelstorage layer, which serves as the foundational element of the system. This module stores data within the blockchain managed by hospitals, with databases distributed across the network. In this module, the important tools used include Next.js, Ethereum, and others. APIs facilitate communication from the user management layerto the secured blockchain database management model storage layer, where incoming requests trigger the data storage processes.

Blockchain storage is predominantlyuseful for transactions that require verification and traceability, as it simplifies the procedure of validating and tracking multistep transactions. It accelerates data transfer, ensures secure transactions, and helps reduce compliance-related costs. MetaMask, is used to interact with the Ethereum blockchain. Ethereumwallets are accessed by users via a mobile app or browser extension, enabling engagement withina non-centralized applications. It demonstrates how Ganacheis used to simulate the behavior of the Ethereum network locally, allowing for the testing of smooth contracts and their interactions before deployment to the main Ethereum network. Ganache also provides a platform for monitoring contract creation and function calls. Figures 6 and 7 depict the local host connection through MetaMask and the route of data transfer/transaction via Ganache.

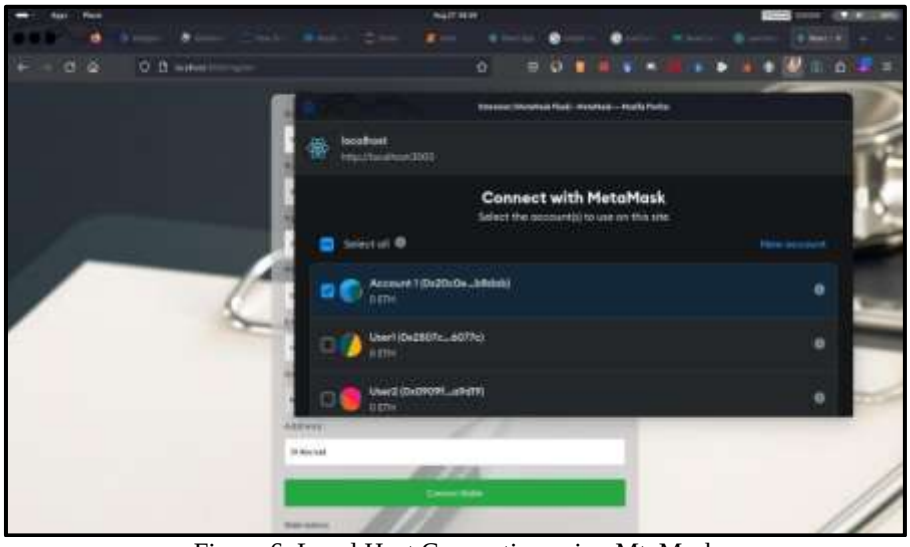

Figure 6: Local Host Connection using MtaMask

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

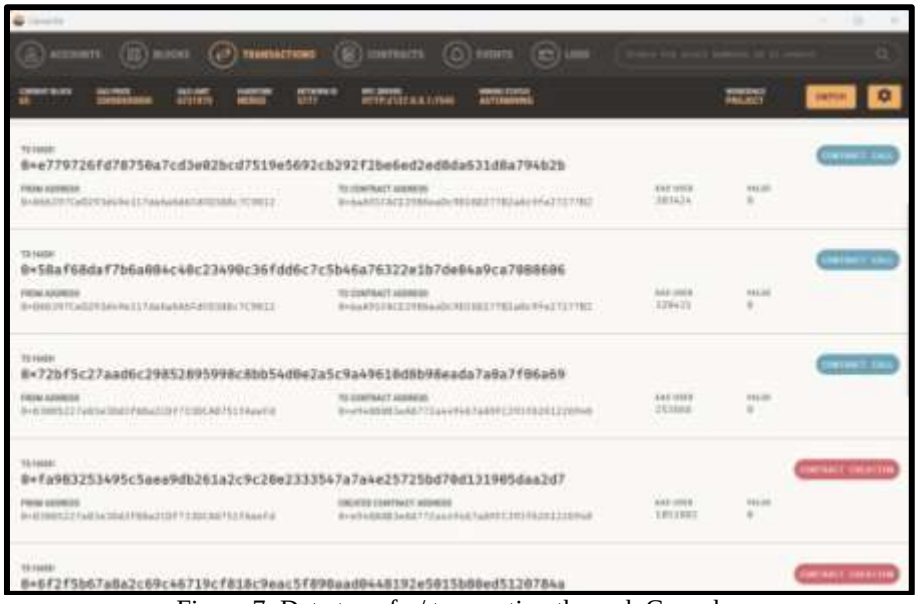

Figure 7: Data transfer/ transaction through Ganache

4.3. EHR Generation and View Layer

The third module is the electronic health record generation and view layer, which offers a detailed and streamlined method for managing electronic health information of the patients. This module gives those that in the clinic and others that needs patient's information to access when needed and offers tools for searching, filtering, and visualizing trends and patterns in the data. With patient consent, physicians can easily control and manage records remotely, allowing them to view and update patient information during medical visits.

Patients will have greater control over their health data, allowing them to selectively grant or deny access to different parts of their medical history. They can decide which portions of their records are shared with healthcare providers, while keeping other information private and secure. The decentralized nature of secured blockchain database management model for medical based organizationpromotes interoperability across healthcare organizations, making it possible to implement unified and standardized patient information storage mechanism. Figure 8 shows the Patient List Page, which displays the interface for managing and accessing patient data.

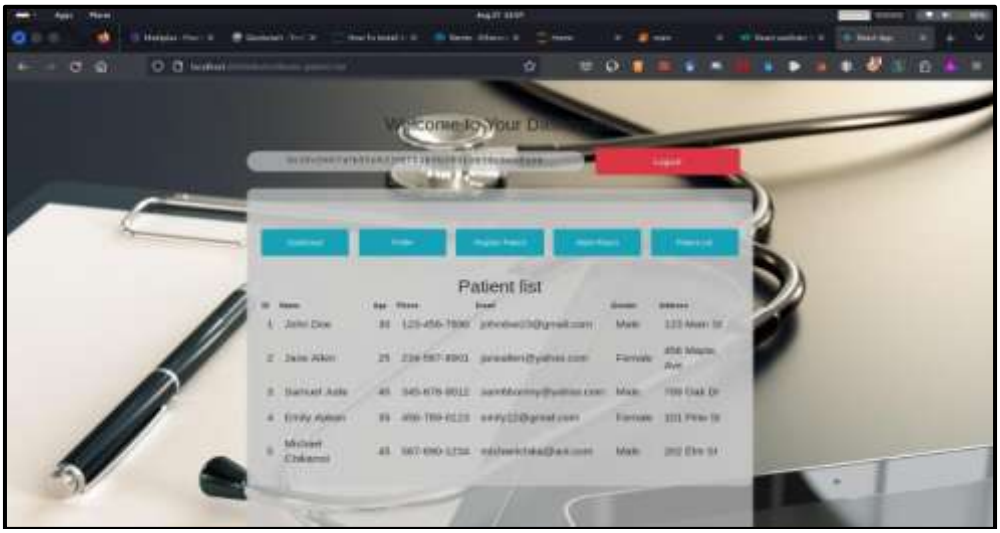

Figure 8: Patients List Page

International Journal of Advances in Engineering and Management (IJAEM)
Volume 7, Issue 05 May 2025, pp: 312-323 www.ijaem.net ISSN: 2395-5252

V. SUMMARY AND CONCLUSION

The medical sector plays an indispensable part in the growth of the economy, as it is responsible for the monitoring, treatment and management of the health and well-being of individuals and communities. A thriving healthcare system is essential for the national and socioeconomic development of a country, which is why the world health organization emphasizes that adequate budget allocation to this sector. Also addressing the healthcare requirement for the teeming population, this sector is also responsible for storing, retaining and exchanging huge chunk of information for high-quality care. However, these functions come with challenges like improving the technical support mechanisms and robust security measures.

With the deployment of the secured blockchain-based secure database management model in healthcare organizations marks a major advancement in the medical and healthcare sector. By utilizing blockchain technology, this system has revolutionizes data/informationsafekeeping and ensures patient privacy, preventing unauthorized access. It facilitates an easy way of sharing of electronic health records across healthcare institutions, improving overall coordination. Furthermore, the use of these intelligent contracts streamlines patient consent management and regulatory compliance, significantly reducing administrative tasks. This system demonstrates the transformative prospective of blockchain in the medical and healthcare systems, optimizing the distribution of secured, patient-centered services while enhancing the integrity of data and protection.

REFERENCE

[1]. Abdulai, A. F & Adam, F. (2020). Health providers' readiness for electronic health records adoption: A cross-sectional study of two hospitals in northern Ghana. PloS one, 15(6), 118.

[2]. Adeleke, I.T., Erinle, S.A., Ndana, A.M., Anamah, T.C., Ogundele, O.A &Aliyu, D. (2015). Health Information Technology in Nigeria: Stakeholders' perspectives of nationwide implementations and meaningful use of the emerging technology in the most populous black nation. American journal of health research, 3(1), 17-24

[3]. Agarwal, M., Adhil, M &Talukder, A. K. (2015). Multi-omics multi-scale big data analytics for cancer genomics. International conference on big data analytics (pp. 228-243). Springer international publishing.

[4]. Kruse, CS &Beane, A. (2018). Health information technology continues to show positive effect on medical outcomes: systematic review. Journal of medical internet research, 20(2), 41-50.

[5]. Rezaeibagha, F., Win, KT &Susilo, W. (2015). A systematic literature review on security and privacy of electronic health record systems: technical perspectives. Journal of Health Information Management, 44(3), 23-38.

[6]. Dash, S., Shakyawar, S.K., Sharma, M &Kaushik, S. (2019). Big data in healthcare: management, analysis and future prospects. Journal of big data, 54(6), 1-25.

[7]. Alobo, I.G., Soyannwo. T., Ukponwan, G., Akogu, S., Akpa, AM &Ayankola,. K. (2020). Implementing electronic health system in Nigeria: perspective assessment in a specialist hospital. African health sciences, 20(2), 948-954.

[8]. Detmer, D. (2014). Recent US Experience with Health ICT. In M. W. Rosenmöller, Managing eHealth (pp. 202–214). Palgrave Macmillan.

[9]. Torre-Diaz, I., García-Zapirain, B &López-Coronado, M. (2017). Analysis of security in big data related to healthcare. Journal of digital forensics, security and law, 12(3), 39-46.

[10]. Rai, B.K &Srivastava, A.K. (2014). Security and privacy issues in healthcare information system. International journal of emerging trends & technology in computer, 3(6), 248252.

[11]. Demirdogen, G., Işık, Z &Arayici, Y. (2023). BIM-based big data analytic system for healthcare facility management. Journal of building engineering, 64(2), 45-56.

[12]. Belmonte, E.M., Tortosa, S.O., Ortega, L & Gutiérrez-Martínez, J. (2023). Healthcare information technology: A systematic mapping study. Healthcare information research, 29(1), 4-15.

[13]. Anazia, K. E. Ojei, E. OEti, E. F. &Idama, R. O. (2024). Healthy dietary habits: persuasive technology model for dietary management, International journal of science and research archive, 2024,

13(02), 3455-3466. CROSS Ref DOI:10.30574/ijsra, https://:ijsra.net

[14]. Benjelloun, F &Lahcen, A.A. (2015). Big data security: challenges, recommendations and solutions. In k. m.-m. munir, Handbook of research on security considerations in cloud computing (pp. 301-313). IGI GlobalEditors.

[15]. Anazia, E. K, Adigwe, W. &Ifeose, J. A (2024). Novel web based waste control and management platform, International journal of advances in engineering and management (IJAEM)Volume 6, Issue 03 Mar. 2024, pp: 170-179 www.ijaem.net ISSN: 2395-5252.

[16]. Adigwe W. Anazia E. K.&Madubuezi, C. O. (2022). Blockchain technology: an improved agro-food (poultry) ontology tracking origin, International journal of research publication and reviews, vol 3, no 6, pp 1457-1465, www.ijrpr.com ISSN 2582-7421.

[17]. Zaied, A.N.H., Elmogy, M &Abd Elkader, S. (2015). Electronic health records: Applications, techniques and challenges. International journal of computer applications, 119(14), 38-49.

[18]. Sikder, M. K. A., Chy, A. N &Seddiqui, M. H. (2018). Electronic health record system for human diseaseprediction and healthcare improvement in Bangladesh. Informatics, Electronics & Vision (ICIEV), 2018 International Conference (pp. 1-5). CIEV.

[19]. Anazia, E. K. &Ashie J. A. (2022). Patient e-health system for emergency management International journal for research trends and innovation (www.ijrti.org), 2022 IJRTI Volume 7, Issue 6 | ISSN: 2456-3315 IJRTI2206024 126

[20]. Okpor,M.D,Anazia E. K., and Ukpnusiowho D. (2024). A novel hybrid database security management technique, international journal of science and research archive, international, peer reviewed, open access journal, No. 2582-8185,

[21]. Sankaranarayanan, S &Udayasuriyan, V. (2020). Biometric secured electronic health record. in i. r. Association, virtual and mobile healthcare: breakthroughs in research and practice (vol. 2, pp. 221-248). igi publishers.

[22]. Rahman, M. (2018). Using RFID technology for managing patient medical file. American journal of computer science and information technology, 6(4), 1-4.

[23]. Anazia E. K, Ojei, E. and Okpor, M.D. (2024). A fuzzy logic-based automobile fault detection system using mamdani algorithm, international journal of scientific research and management (IJSRM), ||Volume||12||Issue||03||Pages||1081-1093||2024|| Website: https://ijsrm.net ISSN (e): 2321-3418 DOI: 10.18535/ijsrm/v12i03.ec06.

[24]. Pandey, G., Sunar, A., Yogi, J., Poudel, N &Koirala, K. R. (2023). Electronic health record management system using rfid: improving efficiency and accuracy in healthcare. Journal of information technology and digital world, 5(3), 274-290.

[25]. Feldstein, D.A., Hess, R., McGinn, T., Mishuris, G.R., McCullagh, L., Smith, P.D., Mann, D. (2017). Design and implementation of electronic health record integrated clinical prediction rules (iCPR): a randomized trial in diverse primary care settings. Implementation science, 12(37), 1-11.

[26]. Adebisi, O.A., Oladosu, D. A., Busari, O.A &Oyewola Y.V. (2015). Design and implementation of hospital management system. International journal of engineering and innovative technology (IJEIT), 5(1), 31-34.

[27]. Chukwudi J. Chukwuluba, Omede Gracious Chukwunweike., Abel Edje3, Anazia E. Kizito (2024), Database security system using dynamic time-warping voice recognition authentication, International journal of scientific research and engineering development-– Volume 7 Issue 2, Mar-Apr 2024, Available at www.ijsred.com

[28]. Saimanoj, K., Poojitha, G., Dixit, K.D &Jayannavar, L. (2020). Hospital management system using web technology. Journal of test, engineering and management, 83(1), 44934496.

[29]. Okofu, S. Anazia, E. K. Akazue, M. Ogeh, C. Ajenaghughrure, I.B. (2023). The interplay between trust in human-like technologies and integral emotions: google assistant, KZYJC journal

publications, ISSN: 1001-0920 Volume 38, Issue 01,

[30]. Yavad, G., Lad, P., Pandey, P &Kolla, T. (2016). Advanced hospital database management system. International journal of advanced research in computer and communication engineering, 5(4), 221-223.

[31]. Anazia E. K. &Adigwe W. (2022). IoT enabled smart house system using wi-fi technology, International journal of innovative science and research technology, Volume 7, Issue 8, August – 2022 ISSN No:-2456-2165, IJISRT22AUG370 www.ijisrt.com 590

[32]. Lubrano, F., Stirano, F., Varavallo, G., Bertone, F &Terzo, O. (2021). HAMS: An integrated hospital management system to improve information exchange. in f. s. lubrano, complex, intelligent and software intensive systems (pp. 334-343). Elsevier.

[33]. Garg, S., Goel, T & Dung, S. (2022). STS Hospital management system. International research journal of modernization in engineering technology and science, 4(6), 1399-1404.

[34]. Shinde, S.M., Awatade, S.R., Bhosale, P.G., Deshmane, S.V &Todkari, A.D. (2022). Hospital Management System Using PHP with MySQL. International journal of advanced research in science, communication and technology(IJARSCT), 2(8), 12-15.

[35]. Inyiama, H.C and Anazia E. K. (2020). Enhanced big data veracity classification using neutrosophic logic and neural network, International journal of scientific & engineering research volume 11, Issue 2, February-2020 100 ISSN 2229-5518 http://www.ijser.org.

[36]. Pune, M., Gawade, R., Chavan, P., Shitole, A &Jogdand, S. (2019). Hospital management system. International journal of innovative research in technology, 5(9), 33-34.

[37]. Anpan, P., Udasi, R., Jagtap, S., Thakre, S &Kamble, C. (2020). Hospital management system. International research journal of engineering & technology, 4(7), 56-67.

[38]. Shah, Y., Shaikh, A &Naik, N. (2022). Hospital management system. International journal of creative research thoughts, 10(1), 1-2.

[39]. Gorule, V.V., Gaikwad, S.S., Chougule, Y.S., Ekande, H & Mali, V. (2023). The hospital management system. International research journal of modernization in engineering technology and science, 5(12).

[40]. Shi, J. (2019). The application of blockchain-as-a-service (baas) and its providers in china. Fourth international conference on economic and business management (FEBM 2019) (pp. 127-130). Atlantis Press.

[41]. Ulusoy, H., Colombo, P., Ferrari, E., Kantarcioglu, M., Pattuk, E & Guard, M.R. (2015). Finegrained security policy enforcement for mapreduce systems. 10th ACM symposium on information, computer and communications security(pp. 285-296). Elsevier.

[42]. Al-Dulaimi, HBA & Ku-Mahamud, K.R. (2020). Big data: definition, characteristics, life cycle, applications, and challenges. The 6th international conference on software engineering &computer systems(pp. 234-249). IOP conference series: Materials science and engineering.