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System for Medical Record Department (MRD) using Blockchain

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Abstract: *This paper is developed by overcome the upcoming troubling situation for implementa project here we briefly describe a design ofproject and how it construction done. The system is fundamentally made for govt dental hospitals to store their patients data with security ,backup and user-friendly interface. Initially the system for medical record using blockchain is take some information from user which is medical employee for authentication and take access to store and handle patient data which have some essential details about patient includingcategory and according to their category bifurgate a patients to pay a medical service fees. For eg. senior citizen, prisoner's BPL holders no medical fees for them. While thinking about security we have to put a concept of cryptography in blockchain according to that the data is encrypted and decrypted with generating a secrete common key because of secrete key the conversation between two sites is private and it also retrieving a data is possible.*

Keywords: Economy, Government, lives , Intervention, pharmaceutical

I. INTRODUCTION

The govt dental hospitals are conventionally established to provide a care of maximum patients while concluding this purpose the data is extended day by day in considerable amount to resolve this situation the application system for medical record using blockchain is implemented which control ,store patient data digitally which is speciallymade as security and save data as long as point of view.

Here we design a certain web base application which consists of three modules which is OPD receptionist module, cashier module and admin module respectively.Essentially first two module that is OPD receptionist and cashier fullfill some information for security to proof a indentity like username, password which is display on screen to take a access of next process.

Both modules are put some require details about patients like, uid, name, phone no,gender, category to secure this crucial information about patients we use a encryption and decryption algorithm which is concept of cryptography belong to blockchain in which the user simple text information is converted into cipher text in between to convert simple text to cipher text their is common public key is generated which is reliable to security and decrypt a data that is inverted to encryption It also generate common secrete public key thefees charge the medical department charge from patients to medical service is automatically fullfill on the basis offundament of patient category and accordingto that the fees charge as per putting patientdetails according average of total number ofpatient fees and number of patient is displayon screen at the end the all over data is gofor data verification for third module adminwhich is higher authority of hospital, it also retrieving the patient's data when it required. Application system for medical record using blockchain do not tolerate the arithmetic, typing mispelled and calculation errors. The concept of blockchain is specially focuses ondecentralised system in which the data isencoded at one point to another. The algorithm applied to demonstrate a application is asymentric cryptographic.

The client i,e(modules) transmit a publickey to the server and solicited for data and server encrypt the data with the help of public key along with the encrypted data is transmitted and the client get this data and decrypt.

An important step towards improving the effectiveness and security of patient data management is the adoption of a blockchain- based medical record system in government dental hospitals. The hospital may make sure that patient information is readily available, tamper-proof, and retrievable in real-time by digitizing patient data and putting it on a secure blockchain network.

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There are three modules in the web-basedprogram made for this purpose: OPD receptionist, cashier, and admin. Patients' vital information, including their individual ID, name, phone number, gender, and category, is collected by the OPD receptionist module. To keep patient data secure and private, this information is encrypted using cryptography methods. According to their categorization and the average rate charged to other customers, the cashier module takes care of collecting fees from patients. To avoid mistakes and provide transparency in the fee collection process, this is done automatically. Patient data can be retrieved by the admin module, which has higher authority in the hospital, as needed, offering a more efficient method of data administration.

Blockchain technology offers further advantages in addition to boosting patient data security and streamlining data administration. For instance, it can make it possible to track a patient's progress in real- time, which enables clinicians to act fast and with knowledge. By granting access tocomplete and accurate patient records, it can also aid in reducing errors and enhancing theaccuracy of diagnoses.

II. LITERATURE SURVEY

In this paper ,as the technology is improved day by day as it makes easier for users to used and to keep up with the medical global e-commerce, smart access to need-based clinical information in health systems is abetter option so that they can be accessed from any location. Communication between server and clients is main aim for network security purpose and it is main perspective .

Implementation of such system are necessary as some providers have certaindepartment with am informative systems butthe reporting capabilities are not sufficient tomeet the needs of the business and the accreditation requirements and thus report are manually created for this clinical and adminstrative healthcare informatics problems providers gives priority to make such online system .

In this article, the authors primarily concentrate on developing a hospital website. A government dental and medical hospital's website is also being created here. First we are segmenting the patient data to meet the needs of the hospital and then we are creating a mechanism to protect the data from being tampered with or stolen. Theyput up the concept of using an algorithm at the server end to encrypt the patient data into a cypher text before the transfer and ensure security of the patient data information in order to prevent data theft. The patient's personal information will be encrypted in this section.

In order to protect data from theft, such aslogin information, we use various concept ofcryptography techniques throughout our entire framework. In this paper ,in order to enhance security measures used to medical data ,this study combines 3DES and LSB resulting in dependable and safe storagesharing ,and management. Data breaches are most frequently caused by criminal assault. In this techniques using symmetric key to used for message encryption in alsoencrypted, that is responsible for bettermentof security.

Based on the patient's categorization and the typical fee charged to other patients, the cashier module handles the collection of patient fees. To avoid mistakes and provide transparency in the fee collection process, this is done automatically. The higher authority in the hospital, the admin module, has the ability to retrieve patient data when needed, offering a more efficient method of data administration.

Blockchain technology offers further advantages in addition to boosting patient data security and streamlining data administration. For instance, it might make itpossible to track a patient's progress in real- time, giving clinicians the information they need to act promptly. By granting access to complete and accurate patient records, it can also aid in reducing errors and enhancing the accuracy of diagnoses.Based on the patient's categorization and the typical fee charged to other patients, the cashier module handles the collection of patient fees. To avoid mistakes and provide transparency in the fee collection process, this is done automatically.Patient data can be retrieved by the admin module, which has higher authority in thehospital, as needed, offering a more efficient method of data administration.

Blockchain technology has advantages beyond improving patient data security and optimising data administration. For instance, it might make it possible to track a patient's progress in real-time, giving clinicians theinformation they need to act promptly. By granting access to complete and accurate patient records, it can also aid in reducing errors and enhancing the accuracy of diagnoses. In conclusion, employing cryptography techniques is crucial formaintaining the security and privacy ofsensitive patient data. The mix of methods employed in this study guarantees that the data is secure, encrypted, and restricted to authorised personnel. To satisfy the demandsof the healthcare sector and improve

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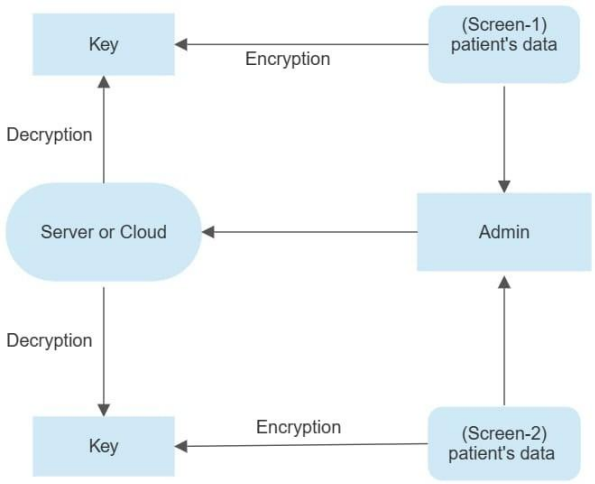
patient care, such systems must be implemented. Itis anticipated that more healthcare providers will implement these systems as technology advances in order to improve data management and patient care.

III. PROPOSED METHODOLOGY

Proposed system concern with map out design and assured security which is notably focuses on bifurgate the patient's data on the basis their category such as BPL holder , prisoner's, senior citizens, sc and so on. While building the application, we divided the models according to the use it is as follows receptionist, cashier, admin receptionistmodule Receptionist module is a module thatwill be display on first screen of project to gain the access of these module user must enter the appropriate secrete information. In this the user has put some required dataabout patients like name, uid, phone number, gender etc and according to it economic category is collect. the filled patient data are encrypted encoded with generating public key and the data is decoded in another end. and all the total bifurgated data average are directly store in the end of screen which the patient's information put.

Cashier module it is second module in application which is inspired by first module the data of patient is same as first receptionist module but the bit change is it put the particular disease of the patient along with his fee the fees are mentioned automatically by fullfilled the potential corruption eventually about data average is converge at the last of screen and literally it pass on third module which is admin.



The algorithm used to encrypt the query pass in system ssl (secure socket link), base 64,sha256,len-40, crc32 .the ssl(security socket layer) The sha1 is the initial algorithm used in application for make data secure which stand for secure hash algorithm based on cryptography to encrypt a data with cryptographic hash function.it take data asinput and convert it 160bit (20 bytes) digest compressed form data. Security socket layer are technique used to established a link between client and server in this case the client is browser all the Algorithm areclearly transmitted data end to end without facing a middle man attack

The suggested solution puts an emphasis on the design of the application in addition to using methods for encryption and security. The user interface is organised into three modules: admin, cashier, and receptionist. Each module performs a different set of tasks.

The patient's economic category, which isused to divide the patient's data, can be entered into the receptionist module by the user. A public key is then used to encrypt thedata, which is then decoded at the other end. The cashier module, on the other hand, is in charge of documenting the patient's specific ailment and the associated cost. The costs are produced automatically based on the disease,removing any chance of corruption. The admin module, which is also in chargeof system management and data storage security, completes the process. The encryption and security methods employedinclude base 64, SHA256, len-40, CRC32, and SSL (Secure Socket Layer).

The secure connection between the client and server, in this case the browser, is created using SSL. The data is encrypted using the SHA256 technique employing acryptographic hash function, which compresses the data into a 160-bit digest. Data encryption and security are also achieved using the len-40 and CRC32 methods.

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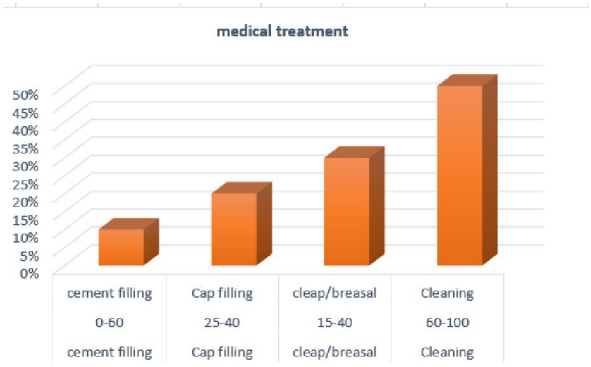
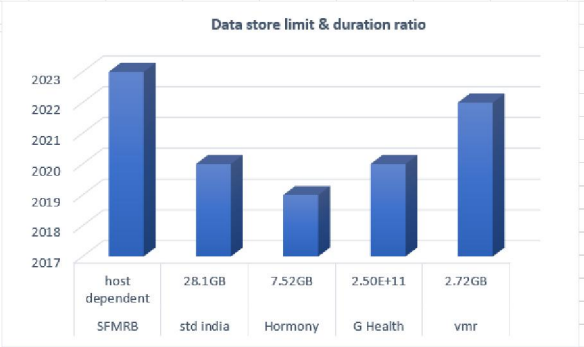
Overall, the proposed system ensures that patient information is safeguarded from unauthorised access or loss and takes intoaccount security issues about medical data. Additionally, it offers an intuitive user interface for the admin, cashier, andreceptionist modules to ensure effective handling of patient data. There are some graph which shows the rate of factor used in these system as compared toother some reference projects.



This graph's methodical presentation focuseson the study of the data showing how many patients and at what stage they areexperiencing dental pain. Based on theanalysis of the data, we are able to forecast that 10% of the patients at dental clinicalhospitals have a big problem with expensive cement fillings. The second stage is cap filling, where 30 percent of patients at dental hospitals often have this procedure, whichcosts just one penny to complete and is silver-coated. Since it is less expensive than cement fillings or cap fillings, 20 percent of patients have their teeth cleaned or have their breathalysers fitted.

The final parameter that we will determine inthis block graph is the cleaning of the teeth, which is used by about 40% of all patients when they have dental related issues is also the least expensive of all. The majority of people wanted this to fixed as the first step. An overview of this representation is made by comparing the patient data.



Here the pictorial representation determinethe data storage capacity and duration taking to deployed some comparision of sites which are developed a similar application just like are application which use case is similar after differentiating the system the data storage limit this system store the unlimited that depend on host which type of storing application we apply if we decidestore a data in cloud it depends on which cloud server we use and other option save a data in person server it has a limitation of maintenance.

According to the the graph presented over their it show ratio of how the system update day by day it goes enhance the data storing capacity of all system is different are system store unlimited data it use SHA256 algorithm that encrypted a data and maintain security and storage.

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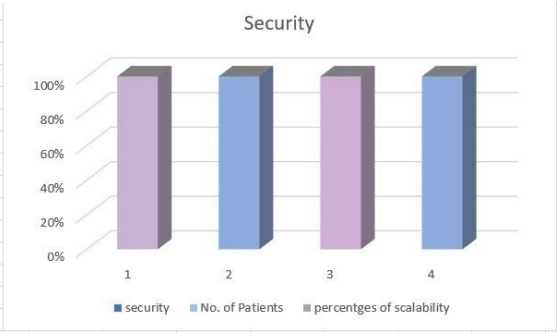

As shown in graph, we can see that the ratio of scalability, as SHA algorithm used to helpthe storage capacity so as the number of patients increase then it's will store inbackend hence the scalibility rate isincreased .

IV. FUTURE SCOPE

The future scope of the project is significant, as the use of a cryptographic system for storing patient data in the hospital can beextended to various other domains as well. One potential application is in the management of electronic medical records(EMRs) where the same cryptographic system can be employed to secure patientdata while making it accessible to authorizedhealthcare providers. Moreover, theintegration of blockchain technology can enhance the security of the data further, making it immutable and tamper-proof

Furthermore, the project's scope can be expanded to include other organizations suchas insurance providers, regulatory bodies, and research institutions that require secure access to patient data

The implementation of a unified, secure platform that facilitates the sharing of patientdata can streamline the healthcare ecosystemand enable better collaboration among stakeholders.

Overall, the future scope of the project isvast, and its potential applications in the healthcare domain are limitless. The integration of emerging technologies such as blockchain and machine learning can enhance the security and accessibility of patient data while enabling new possibilities in medical research and healthcare management.

V. RESULT

The implementation paper that focuses ondeveloping a system for medical records with cryptography is a significant contribution to the field of healthcare. The use of cryptography in medical records can provide an additional layer of security and privacy to sensitive patient information.

The paper presents a well-designed systemthat incorporates various cryptographic techniques to protect patient data. The systemutilizes symmetric and asymmetric encryptionalgorithms to secure communication between different entities involved in medical record management, such as patients, doctors, and hospitals. Additionally, the use of hashing techniques ensures the integrity of the data, and digital signatures provide authentication of the documents.

Overall, the implementation paper provides a thorough and well-explained solution for secure medical record management. The proposed system's use of cryptography can significantly enhance patient privacy and data security, and the detailed analysis and practical implementation make it a valuable contribution to the field.

VI. CONCLUSION

The system, which is specially made for the management of medical records and is currently efficiently available for the user to use this system rather than handling data breaches or manually handling records using a traditional approach, There is always a chance that data can be stolen, modified, or tampered with. But in this online system, the information is maintained in a structured manner. And if you want to search one record, it takes a lot of time to find out those records manually, so this system helps usobtain any records in a relatively short period of time.

Blockchain technology is still in its early stages, and there are many other potentialapplications for it in the healthcare industry. We will continue to see the development of this technology in the years to come. This technology incorporates advanced cryptography mechanisms to enhance data security. Furthermore, it offers unique contract management payment capabilities.

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This system also helpful sometimes when booking appointments. In this system, the admin host has authority to maintain, add,and remove information data, which has no requirements. And the system stores records efficiently so that, as is proposed in thispaper, they are easily accessible according touser need

Since healthcare practitioners can quickly access and share patient records with one another, the online system for managing medical records also enables improved coordination between them, improving patient outcomes. Additionally, it enables the integration of electronic health records (EHRs), which can improve workflows and lower mistake rates. Additionally, because patients can access their records and consult with healthcare professionals from the comfort of their homes, this system can also support remote healthcare services like telemedicine.

As a conclusion, the suggested online system for managing medical data is a safe and effective solution to manage patient records, enhance collaboration between healthcare practitioners, and support remote healthcare services. Blockchain technology integration and the usage of sophisticated cryptography techniques

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