

DELEGATED AUTHORIZATION FRAMEWORK FOR EHR SERVICES USING QR CODE ENCRYPTION

Submitted in partial fulfillment of the requirements for
the award of
Bachelor degree in Computer Science

By

Vasanth.A (Reg.No:38290099)

Sharath.D (Reg.No:38290081)



**DEPARTMENT OF COMPUTER SCIENCE
SCHOOL OF COMPUTING**

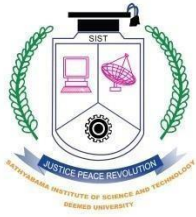
SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

**(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC**

**JEPPIAAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI - 600 119**

APRIL - 2020



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DEPARTMENT OF COMPUTER SCIENCE

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **Vasanth.A (Reg.No:38290099)** and **Sharath.D (Reg.No:38290081)** who carried out the project entitled **“DELEGATED AUTHORIZATION FRAMEWORK FOR EHR SERVICES USING QR CODE BASED ENCRYPTION** “under my supervision from November 2020 to April 2021.

Internal Guide

Dr. J.ALBERT MAYAN ,M.E,, Ph.D.

Head of the Department

Submitted for Viva-Voce Examination held on:

Internal Examiner

External Examiner

DECLARATION

We **Vasanth.A (Reg.No:38290099)** and **Sharath.D (Reg.No:38290081)** hereby declare that the Project Report entitled “ **DELEGATED AUTHORIZATION FRAMEWORK FOR EHR SERVICES USING QR CODE BASED ENCRYPTION** ” done by me under the guidance of **Dr. J. ALBERT MAYAN, M.E, Ph.D.** is submitted in partial fulfilment of the requirements for the award of Bachelor degree in Computer Science.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

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ABSTRACT

The aim of this research is to explore the motives behind the adoption or rejection of Electronic Health Records (EHR) systems in the USA by medical offices. The current health care system in the United States suffers from high expenditures and poor quality. The Patient Protection and Affordable Care Act, passed in 2010, attempts to save costs and improve quality of care by offering incentives to use Electronic Health Records systems. Part of the reform by this law is dependent on the use of technology in managing patient medical and health records. The objective is to reduce redundancy and increase quality by sharing medical information amongst different health organizations like hospitals, physician offices, laboratories and clinical institutions. The success of such reform requires the participation and collaboration of all these entities and their patients. Prior research shows that adoption of Electronic Medical Records systems by hospitals and physician offices has been evident but at a rate that is slower than in other countries. Aside from financial barriers, technical, psychological, social /legal and organizational barriers exist. In order to Understand these impact we create our project. The main goal of our project is to design a mobile application for patients through web-based application management that acquires secure access to patient records through cloud storage service. Admin can remotely store patient data to the cloud with safe and secure cloud storage through and Patient can easily access their data which are stored in cloud based on EHR Service management. Remote data integrity of health record is proposed to guarantee the integrity of the secured data stored in the cloud. In some common cloud storage systems, cloud file might contain some sensitive information. Encrypting the whole shared file can realize the sensitive information hiding, but will make this shared file unable to be used by others. In this paper we propose a remote document reference id automatically convert to the QR code then just scan user module then download the particular document integrity that realizes data sharing with sensitive information hiding. Signatures are used to verify the file in the phase of integrity health records.

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LIST OF ABBREVIATIONS

S.NO	ABBREVIATION	EXPANSION
1.	DEX	Dalvik Executable File
2.	DVM	Dalvik Virtual Machine
3.	ADT	Android Development Tool
4.	SDK	Software Development Kit
5.	APK	Application Package File
6.	JRE	Java Runtime Environment
7.	ADB	Android Debug Bridge
8.	DDMS	Dalvik Debug Monitor Service

CHAPTER 1

INTRODUCTION

1.1 OUTLINE OF THE PROJECT

The rapid advancement of Information Technology and the explosive growth of health information, the Medical Institutions create Electronic Health Record (EHR) systems. An Electronic Health Record refers to comprehensive record of an individual patient health care history in digital format. The Electronic Health Record contains all health information belonging to a patient. Electronic Health Record data is accessed (or) entered electronically by healthcare providers over the person's lifetime.

Electronic health record is used to store health information of a patient in HealthIt can be made by the Medical Reports of a patient obtained from different health measurement devices. An EHR is able to provide complete, accurate information of patient. The stored health-related information in a health smart card can be accessed by the Electronic Health Record at any time. These are usually accessed by the patient, and can also be accessed by the other specialist through World Wide Web network. EHR systems are increase the physician efficiency and reduce costs and also reduce the medical errors.

The efficiency, productivity, and quality of healthcare institutions depend very much on the information technology, which is used in the patient care process. It mentioned in some words about EHR are, "The future of Information Technology is about developing new relationships between health care practitioners and patients. Information technology programs work collaboratively with doctors to develop new ways of delivering health care that overcome the deficiencies that set in the traditional doctor patient relationship." Electronic Health Record systems improve significant change to contribute the advancement of medicine and also improve the healthcare quality and patient safety.

Information of Health Card is able to provide report and decision support of a patient at all points of care with all healthcare professionals, in such a way that the

quality of healthcare can be improved. EHR system includes the new useful information that is not available from paper-based records and it also overcomes the problems of paper-based records. EHR system also increases the efficiencies in healthcare administration and expands the research capabilities.

There are quite benefits with EHR, especially in the areas of medical error reduction, compliance, completeness of records, decision support, accurate billing, and even returns on investment. The electronic health record is a technology touted as a standard of practice for American medicine in the 21st century. This technology brings the medical records and health information from the measurement room to computer hardware and software room for patient record materials, and Internet search capabilities. The EHR system technology based infrastructure that eliminates handwritten clinical data in few years.

An smart health card of a patient's also contain information about the type of treatment that a patient has been received from a healthcare provider, such as the patient's medical history, lifestyle, prescribed medication, test results, etc. Usually the patient's healthcare provider can also access the EHR records and insurance companies, government agencies, other healthcare providers such as nurses, and the medical information bureau may also access the patient's records. Physician-patient encounter problems are also eliminated by the EHR system. Electronic health data however used to suggest sufficient treatment to the patient from different specialists/physician with the EHR. Physicians with Electronic Record speed up the treatment with the fast accessing of digital data. The health information in electronic health record will be used as right information in the right hands at the right time will support patient health care to make correct health decision.

History and Evaluation overview of EHR

With the many advances in information technology over the past few years, particularly in healthcare, a number of different forms of electronic health records (EHR) have been developed, and implemented. EHR work has been undertaken by the institutions or countries on different forms of a computerized patient healthcare information system there are many reasons to change paper record system to an

electronic system. The major step in the healthcare is expected to move from a paper to a paperless environment. There are different reasons to encouraging healthcare practitioners to an electronic system is as follows

- Improve the accuracy and quality of data recorded in a health record.
- Enhance healthcare practitioners' access to a patient's healthcare information enabling it to be shared by all, for the present and continuing care of the patient.
- Improve the quality of care as a result of having health information immediately Available at all times for patient care.
- Improve the efficiency of the health record service, Contain healthcare costs.
- A paperless environment will come with the introduction of an electronic health Record and eliminate many of the problems in maintaining paper health records.
- EHR maintains privacy and confidentiality The World Health Organization (WHO) highlighted the need for better healthcare services.

This required a change of focus in healthcare in many areas to ensure, if possible, that the implementation of an electronic health record covers healthcare delivery services across a broad spectrum of health care.

Evaluation of an Electronic Health Record over the years a number of terms have been used to describe the move from a manual or paper record to generated electronically in different forms. Some of the better-known terms are

- Automated Health Records (AHR)
- Electronic Medical Record (EMR)
- Computer-based Patient Record (CPR) and
- Electronic Health Record (EHR)

Automated Health Records (AHR)

The term Automated Health Records (AHR) has been used to describe a collection of Computer stored images of traditional health record documents. Typically, these documents are scanned into a computer and the images are stored on memory disks. Most of the focus in the early 1990's was on document scanning and storing

onto a memory disks. The addressed access, space, and control problems related to paper patient care level.

Electronic Medical Records (EMR)

The Electronic Medical Record (EMR) is same as an Automated Health Records. The EMR has been used to describe automated systems based on document imaging or systems, which have been developed within a medical practice/health centre. These have been used extensively by general practitioners in many developed countries and include patient identification details, medications and prescription generation, laboratory results and in some cases all healthcare information recorded by the doctor during each visit by the patient [8]. In some cases EMR include the electronic medical system within a hospital, which as well as the above includes clinical information entered by the healthcare professional at the point of care.

Computer-based Patient Record (CPR)

The term Computer-based Patient Record (CPR) was introduced in the 1990's in the USA. This was defined as a collection of health information for one patient linked by a patient identifier. The CPR could include as little as a single episode of care for a patient or healthcare information over an extended period of time [9]. Early CPR's focused on functions such as medical alerts, medication orders, providing integrated data on a patient's registration, admission, financial details and recording information from nurses, laboratory, radiology, and pharmacy. Although this form of a computer-based patient record was implemented in a variety of settings the focus on exchanging health information was limited to inpatient facilities.

Electronic Health Record (EHR)

The Electronic Health Record (EHR) includes all information contained in a traditional health record including a patient's health profile, behavioural and environmental information. The EHR also includes the time, which allows for the inclusion of information across multiple episodes and providers, which will ultimately evolve into a lifetime record. This type of system would require a computer program that captures data at the time and place where healthcare is provided, whether at a hospital (or) primary care level over an extended period of time. It would enable healthcare information, such as a person's allergies, recent test results or prescribing history to be

readily available at all times to assist with decisions on diagnoses, treatment and medication at all levels of healthcare. Ideally it should reflect the entire health history of an individual across his/her lifetime including data from multiple providers from a variety of healthcare settings. The proposed Electronic Health Record by the World Health Organization (WHO) will have the following parameters

- Contain all personal health information of an individual patient, from the patient's first admission or attendance at the hospital
- Be entered electronically by healthcare providers at the point of care over the patient's lifetime
- Information readily available and accessed by all healthcare providers attending to the patient.

The electronic health record decided upon the health information [12] contained in it must be organized primarily to support continuing, efficient, and quality healthcare. It must also continue to meet legal, confidentiality, and retention requirements of the patient, the attending health professional and health care institution.

EXISTING SYSTEM

EXISTING CONCEPT

The Existing concept is a proper authorization delegation mechanism to use cloud-based EHR Service management using Attribute Based Encryption (ABE) in web technologies that involves the combination of using semantic web technique with attributes based schemes

EXISTING ALGORITHM

Attribute Based Encryption (ABE).

ALGORITHM DEFINITION

Attribute-based encryption is a type of public-key encryption in which the secret key of a user and the cipher text are dependent upon attributes.

DRAWBACKS

- Developed in Web technologies.
- Network could be exploited.

PROPOSED SYSTEM

PROPOSED CONCEPT

In this Project we propose a remote document reference id automatically convert to the QR code then just scan user module then download the particular document integrity that realizes data sharing with sensitive information hiding. Signatures are used to verify the file in the phase of integrity health records.

PROPOSED ALGORITHM

QR code generate Algorithm

ALGORITHM DEFINITION

QR code proves to be too expensive for many applications as compared to other tracking and identification methods, such as the simple barcode

ADVANTAGES

- The advantage to using these tools is that you can develop the content once and then revise as necessary. Advance security using QR code.

CHAPTER 2

REQUIREMENTS ENGINEERING

GENERAL

These are the requirements for doing the project. Without using these tools and software's we can't do the project. So we have two requirements to do the project. They

1. Hardware Requirements.
2. Software Requirements.

HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system.

PROCESSOR	:	Intel Core i3.
RAM	:	4 GB DDR2 RAM
HARD DISK	:	100 GB

SOFTWARE REQUIREMENTS

The software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the team's and tracking the team's progress throughout the development activity.

Front End	:	ANDROID XML, JAVA
Back End	:	SQLITE
Operating System	:	Windows 07
IDE	:	Eclipse, Android Studio

LITERATURE SURVEY

Title : Electronic Medical Records Adoption and Use

Author: Rag hid El-Yafouri, Leslie Klieb

Year : 2014

Description:

The aim of this research is to explore the motives behind the adoption or rejection of Electronic Health Records (EHR) systems in the USA by medical offices. The current health care system in the United States suffers from high expenditures and poor quality. The Patient Protection and Affordable Care Act, passed in 2010, attempts to save costs and improve quality of care by offering incentives to use Electronic Health Records systems. Part of the reform by this law is dependent on the use of technology in managing patient medical and health records. The objective is to reduce redundancy and increase quality by sharing medical information amongst different health organizations like hospitals, physician offices, laboratories and clinical institutions. The success of such reform requires the participation and collaboration of all these entities and their patients. Prior research shows that adoption of Electronic Medical Records systems by hospitals and physician offices has been evident but at a rate that is slower than in other countries. Aside from financial barriers, technical, psychological, social/legal and organizational barriers exist. In order to understand the impact of those barriers on the adoption of Electronic Health Records management by small physician offices better, a five-level adoption model is presented to define the stages of diffusion of EHR systems. Fifteen consolidated barriers are mapped to each adoption level. This research concentrates on smaller physician offices because hospitals and larger institutions are more ready and capable of adoption, according to previous research. The Diffusion of Technology Model by Rogers, the Theory of Planned Behavior by Janzen and Fishbone, and Davis' Technology Acceptance Model are combined and extended. This model will be used to empirically measure physicians' attitudes, knowledge, social and legal influences, subjective norm and systems' ease of use and usefulness amongst other variables. These variables are applied as mediators or moderators of the intention and decision to adopt or move into subsequent levels of adoption with the goal of seeing what drives those decisions.

Title: Research of Access Control in Electronic Medical Record Based on UCON

Author: JuJianguo, Chen Weihe, Zhan Yongzhao

Year : 2011

Description:

Access control mechanisms are vital to the privacy preservation and information security in electronic medical record system. In this paper, we analyze the existing drawbacks in traditional access control models firstly and outline the characteristics of next generation access control UCON. Then we apply the idea of UCON to electronic medical record system to meet the challenge of confidentiality, privacy preservation and data integrity. Then the novel access control formalisms of electronic medical record are presented. Various applications are presented to demonstrate its effectiveness.

Title : Scalable and Secure Sharing of Personal Health Records in Cloud Computing Using Attribute-Based Encryption

Author: Ming Li, ShuchengYu,YaoZheng, KuiRenandWenjing Lou

Year: 2013

Description:

Personal health record (PHR) is an emerging patient-centric model of health information exchange, which is often outsourced to be stored at a third party, such as cloud providers. However, there have been wide privacy concerns as personal health information could be exposed to those third party servers and to unauthorized parties. To assure the patients' control over access to their own PHRs, it is a promising method to encrypt the PHRs before outsourcing. Yet, issues such as risks of privacy exposure, scalability in key management, flexible access, and efficient user revocation, have remained the most important challenges toward achieving fine-grained, cryptographically enforced data access control. In this paper, we propose a novel patient-centric framework and a suite of mechanisms for data access control to PHRs stored in semi trusted servers. To achieve fine-grained and scalable data access control for PHRs, we leverage attribute-based encryption (ABE) techniques to encrypt each patient's PHR file. Different from previous works in secure data outsourcing, we focus on the multiple data owner scenario, and divide the users in the PHR system into

multiple security domains that greatly reduces the key management complexity for owners and users. A high degree of patient privacy is guaranteed simultaneously by exploiting multiauthority ABE. Our scheme also enables dynamic modification of access policies or file attributes, supports efficient on-demand user/attribute revocation and break-glass access under emergency scenarios. Extensive analytical and experimental results are presented which show the security, scalability, and efficiency of our proposed scheme.

Title : An Efficient Cloud-based Personal Health Records System Using Attribute-Based Encryption and Anonymous Multi-Receiver Identity-Based Encryption

Author:Chang-Ji Wang, Xi-Lei Xu, Dong-Yuan Shi, Wen-Long Lin

Year: 2014

Description:

As an emerging patient-centric model of health information exchange, cloud-based personal health record (PHR) system holds great promise for empowering patients and ensuring more effective delivery of health care. In this paper, we propose a novel patient-centric cloud-based secure PHR system, which allows patients to securely store their PHR data on the semi-trusted cloud service providers, and selectively share their PHR data with a wide range of users, including health care provider like doctors and nurses, family members or friends. To reduce the key management complexity for owners and users, we divide the users in the cloud-based PHR system into two security domains named public domain and personal domain. Different from previous cloud-based PHR system, PHR owners encrypt their PHR data for the public domain using ciphertextpolicy attribute-based encryption scheme, while they encrypt their PHR data for the personal domain using anonymous multi-receiver identity-based encryption scheme. Only authorized users whose credentials satisfy the specified ciphertextpolicy or whose identities belong to dedicated identities can decrypt the encrypted PHR data, where ciphertext-policy or dedicated identities are embedded in the encrypted PHR data. Extensive analytical and experimental results are presented which show the patient-centric cloud-based secure PHR system is secure, scalable and efficient.

Title:Designing Privacy Information Protection of Electronic Medical Records

Author: Tzu-Wei Tseng ,Cheng-Yi Yang,Chien-Tsai Liu*

Year: 2016

Description:

In recent years, the interoperability, exchange, privacy, and security of electronic medical records (EMR) across healthcare institution has become an important international issue within medical informatics. Currently Taiwan's electronic medical records exchange center (EEC) system lacks a mechanism for patients to consent to releasing only portions of their EMR. This study uses the IHE BPPC profile and HL7 Confidentiality code to develop privacy policies matrices and patient privacy protection mechanism. Although adding confidentiality codes in Taiwan's electronic medical records would increase the workload for physicians and other healthcare professionals, it would also ensure greater security in the transmission of sensitive information, thereby enhancing the level of security for patients.

INFERENCE FROM LITERATURE SURVEY

- Electronic health records allows a patient's health record to move with other health care providers, specialists, hospitals and nursing homes
- Both EMR and EHR help make healthcare more efficient and less costly but to go beyond basic clinical data and focus on the total health of each patient, you need an EHR solution
- Paper records pose a number of security risks and it can be difficult to detect when they have been tampered, with electronic health records, you can maintain your patient data in secure backups, enabling your organization to quickly recover after a data disaster
- EMR is usually limited to one practice and the information doesn't travel out easily. EHR allows patient information to be shared care facilities
- EHR is a computer record that organized and controlled by doctors, a personal health record (PHR) can be generated by physicians, patients, hospitals, pharmacies, and other sources but is controlled by the patients

CHAPTER 3

PROJECT DESCRIPTION

MODULES

- Login / Registration.
- Database Creation.
- Medical Data upload
- QR Code Encrypted
- Medical data View/Remove
- Security Scanner
- Medical File Download

LOGIN & REGISTRATION

In this module we design to develop login and signup screen. Android used xml to develop classical screens in our application. The modules describe signup page contains email id or user name and password those kind of details should be stored in database. When the user to login the app it should be retrieve the data to the database and combine based on user input if its match user name and password then it will allow in the app otherwise alert and show a message to the user invalid.

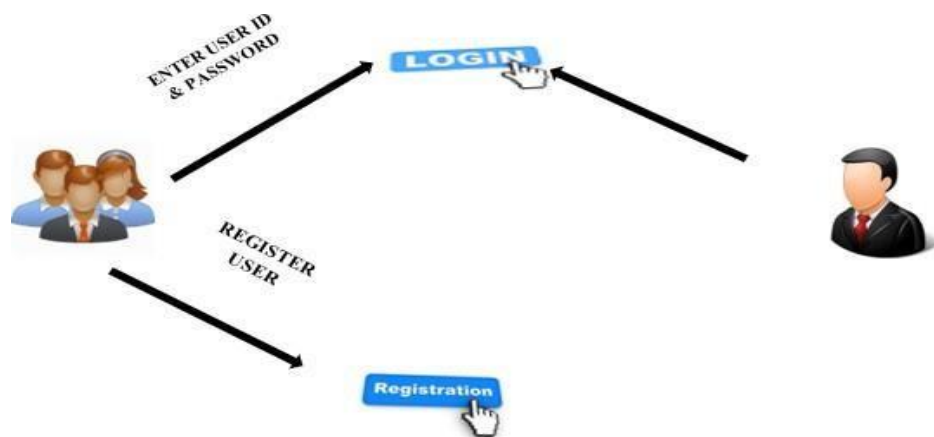


Fig 3.1 Login and Registration

DATABASE CREATION

Client email id or name and secret key are put away in these SQLite database for putting away and bringing client application structure

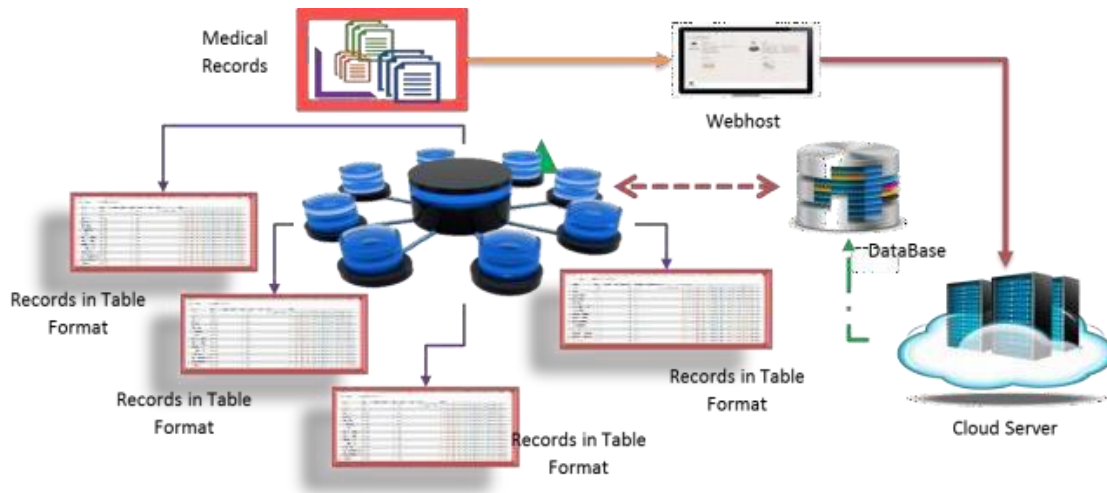


Fig 3.2 Database creation

MEDICAL DATA UPLOAD

In this module, the hospital admin is used to upload the medical reports of patients in the cloud and this information is stored securely and these records can be retrieving anywhere whenever the patient is in the hospital.

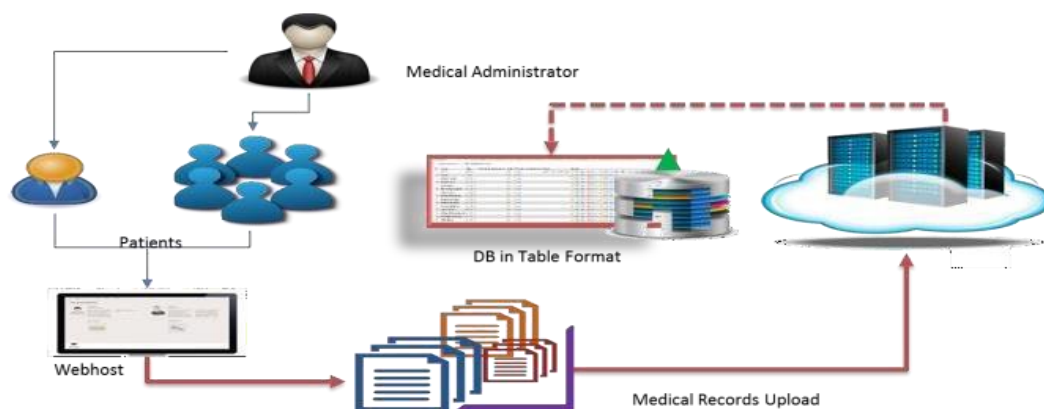


Fig 3.3 Medical data upload

QR CODE ENCRYPTOR

In this module, we have created a QR code generate it is used to Encrypt the data of the patients by scanning the QR code only the admin can access the details of the patients.

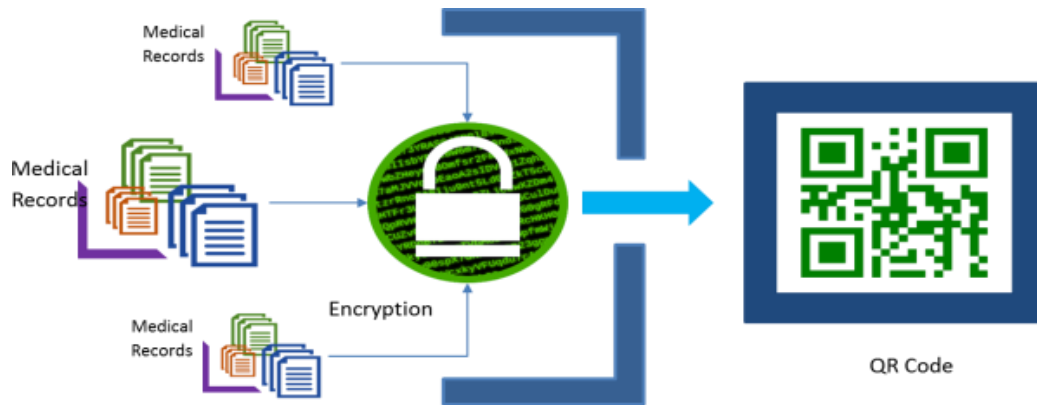


Fig 3.4 QRCode Encryptor

3.1.6 MEDICAL DATA VIEW / REMOVE

In this module, medical data view/remove that process can be used on logged user view a medical data and incase that data can remove. But original values not deleted permanently.

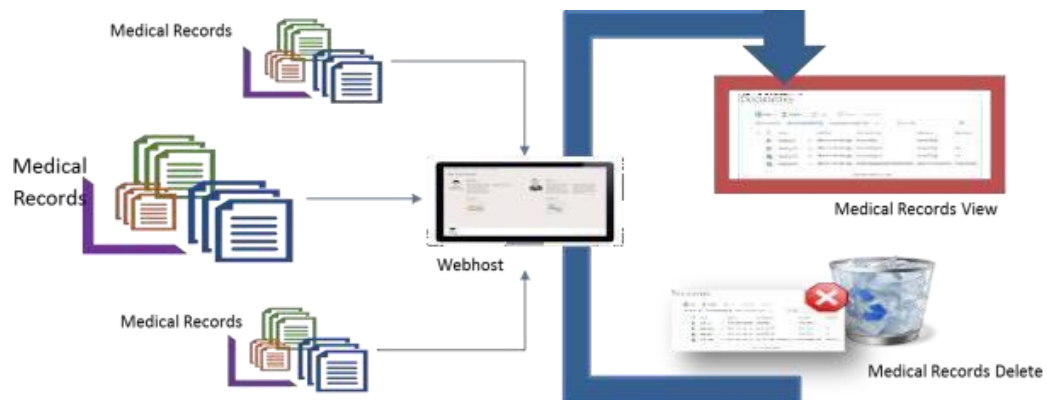


Fig 3.5 Medical data view/remove

3.1.5 SECURITY SCANNER

In this module whenever the user login and scan the qr code then it will identify the particular patient and it is used to send the otp to that particular patient phone number then only the data can be accessed.

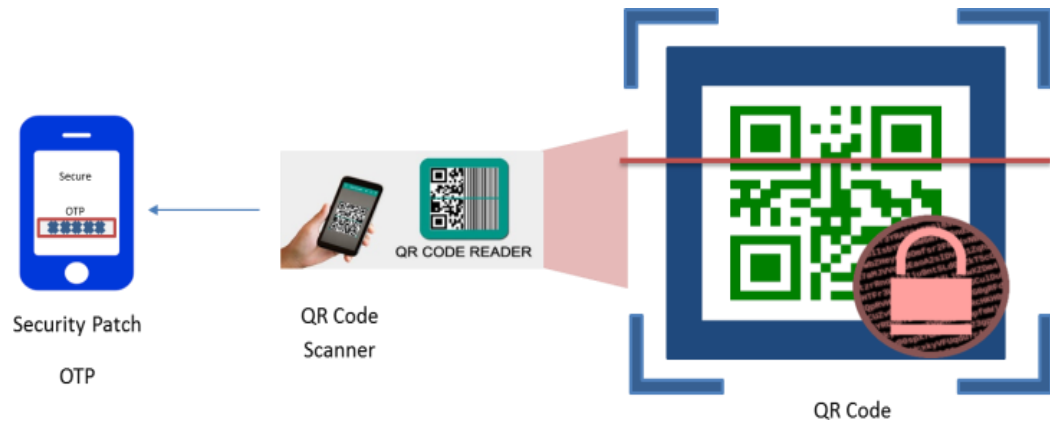


Fig 3.6 Security scanner

3.1.7 MEDICAL FILE DOWNLOAD

Whatever the data stored in the cloud about that particular patient medical file that can be downloaded from the cloud and can view the document by the admin and by seeing the past prescription he used to treat the patient in the same way or in a different way.

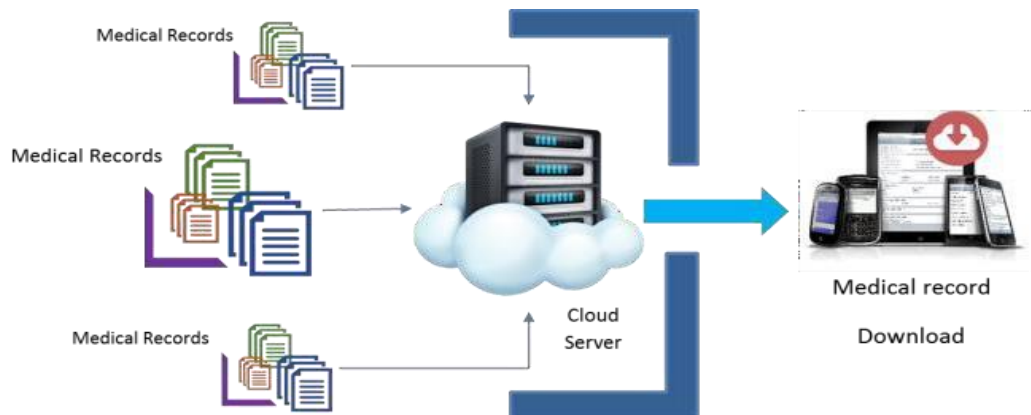


Fig 3.7 Medical file download

SYSTEM ARCHITECTURE

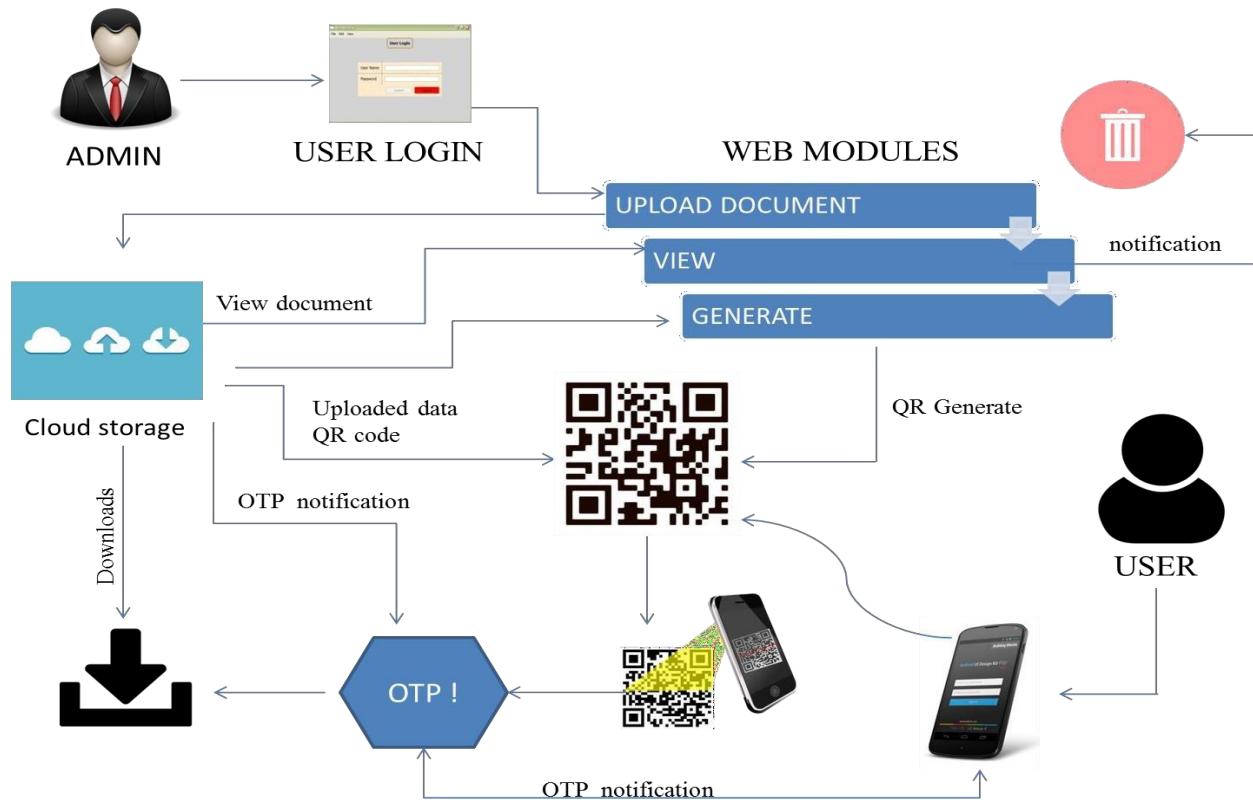


Fig 3.8 System architecture

Explanation

In these admin has to register first and then he can login with his id and password. And then he can open a patient detail web page and can enter the details of patient name,id,gender,email,phone number,doctor name and treatment then after visiting the doctor whatever the prescription written by the doctor it will be stored in a digital format and that file is uploaded in the cloud. Whenever the patient is used to login in his mobile then the user used to login in the android mobile app then he used to scan the QR code then it will send the OTP to the register phone number of patient. The patient has to enter the correct OTP then only it will allow you to access the file and then you can download and can view the file.

CHAPTER 4

DESIGN ENGINEERING

GENERAL

Design Engineering deals with the various UML [Unified Modeling language] diagrams for the implementation of project. Design is a meaningful engineering representation of a thing that is to be built. Software design is a process through which the requirements are translated into representation of the software. Design is the place where quality is rendered in software engineering. Design is the means to accurately translate customer requirements into finished product.

USE CASE DIAGRAM

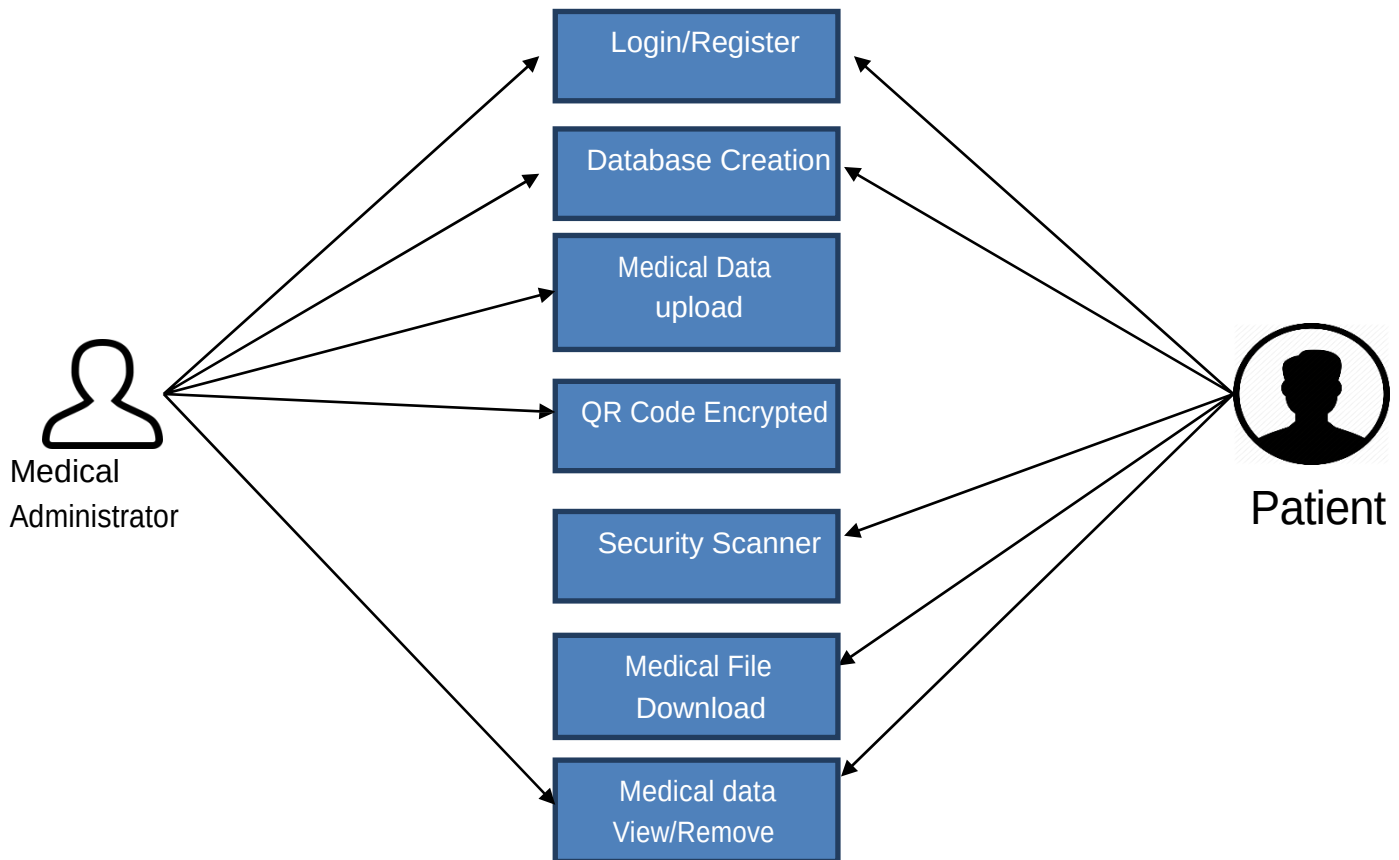


Fig 4.1 Use case Diagram

Explanation

Use case diagrams are considered for high level requirement analysis of a system. So when the requirements of a system are analyzed the functionalities are captured in use cases. So we can say that use cases are nothing but the system functionalities written in an organized manner. Now the second things which are relevant to the use cases are the actors. Actors can be defined as something that interacts with the system. The actors can be human user, some internal applications or may be some external applications.

Functionalities to be represented as a use case, Actors and Relationships among the use cases and actors. The name of a use case is very important. So the name should be chosen in such a way so that it can identify the functionalities performed. Give a suitable name for actors. Show relationships and dependencies clearly in the diagram. Do not try to include all types of relationships. Because the main purpose of the diagram is to identify requirements. Use note whenever required to clarify some important point.

CLASS DIAGRAM

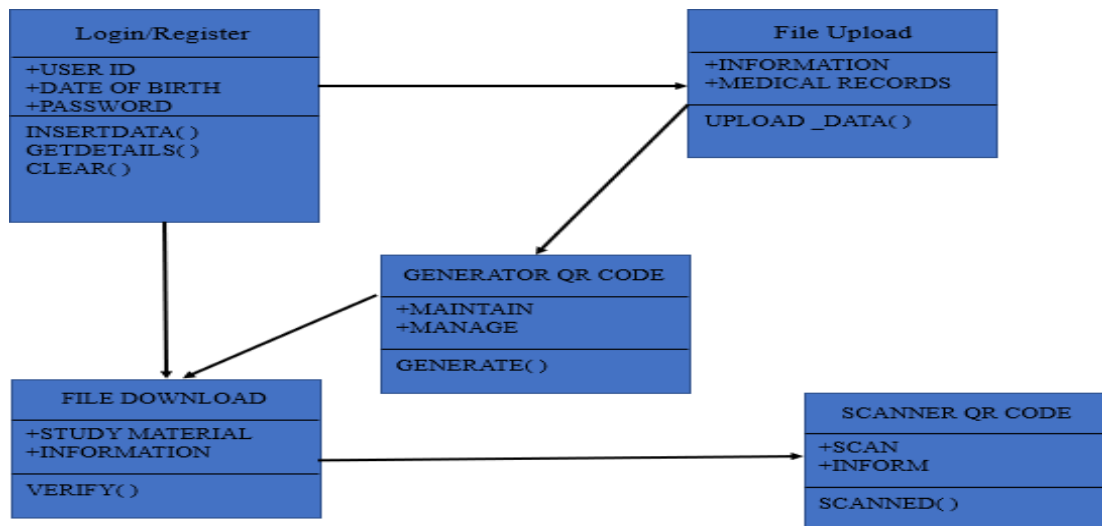


Fig 4.2 Class Diagram

Explanation

Class diagram is basically a graphical representation of the static view of the system and represents different aspects of the application. So a collection of class diagrams represent the whole system. The name of the class diagram should be meaningful to describe the aspect of the system. Each element and their relationships should be identified in advance Responsibility (attributes and methods) of each class should be clearly identified for each class minimum number of properties should be specified. Because of unnecessary properties will make the diagram complicated.

Use notes whenever required to describe some aspect of the diagram. Because, the end of the drawing it should be understandable to the developer/coder. Finally, before making the final version, the diagram should be drawn on plain paper and rework as many times as possible to make it correct.

ACTIVITY DIAGRAM

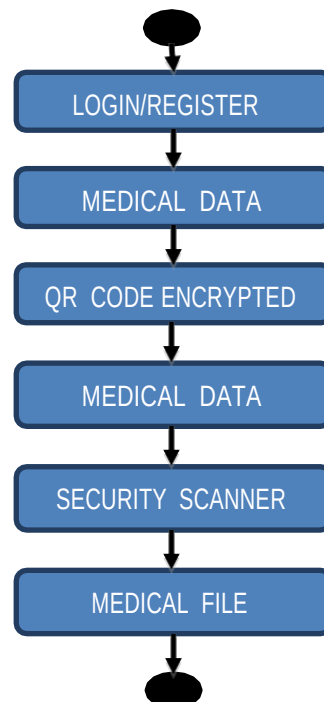


Fig 4.3 Activity Diagram

Explanation

Activity is a particular operation of the system. Activity diagrams are not only used for visualizing dynamic nature of a system but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in activity diagram is the message part.

It does not show any message flow from one activity to another. Activity diagram is some time considered as the flow chart. Although the diagrams looks like a flow chart but it is not. It shows different flow like parallel, branched, concurrent and single

SEQUENCE DIAGARAM

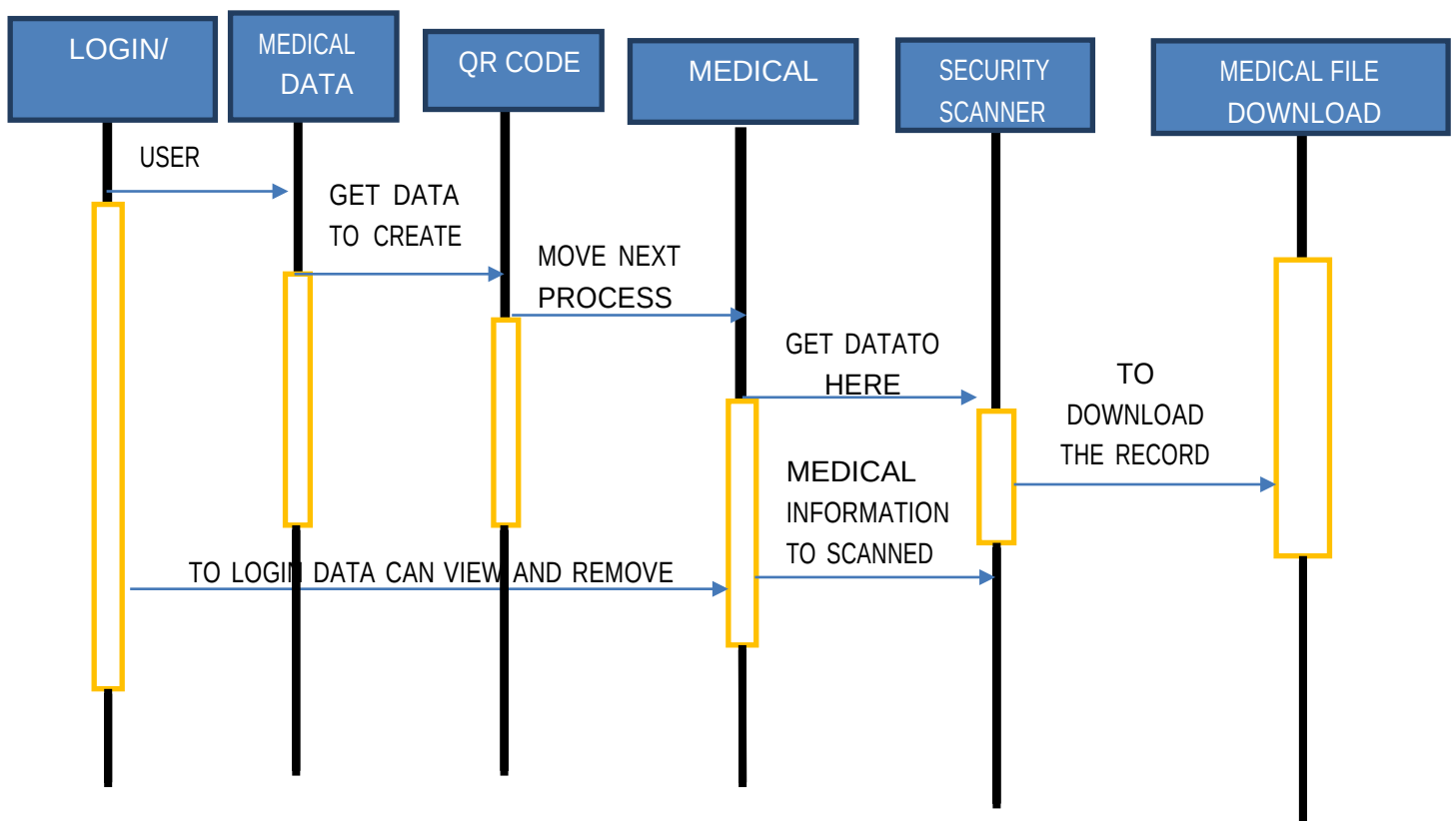


Fig 4.4Sequence Diagram

Explanation

UML sequence diagrams model the flow of logic within your system in visual manner, enabling you both to document and validate your logic, and are commonly used for both analysis and design purposes. Sequence diagrams are the most popular UML artifact for dynamic modeling, which focuses on identifying the behavior within your system. Sequence diagrams, along with class diagrams and physical data models are in my opinion the most important design-level models for modern business application development. Other dynamic modeling techniques include activity, communication diagrams interaction overview diagram

COMPONENT DIAGRAM

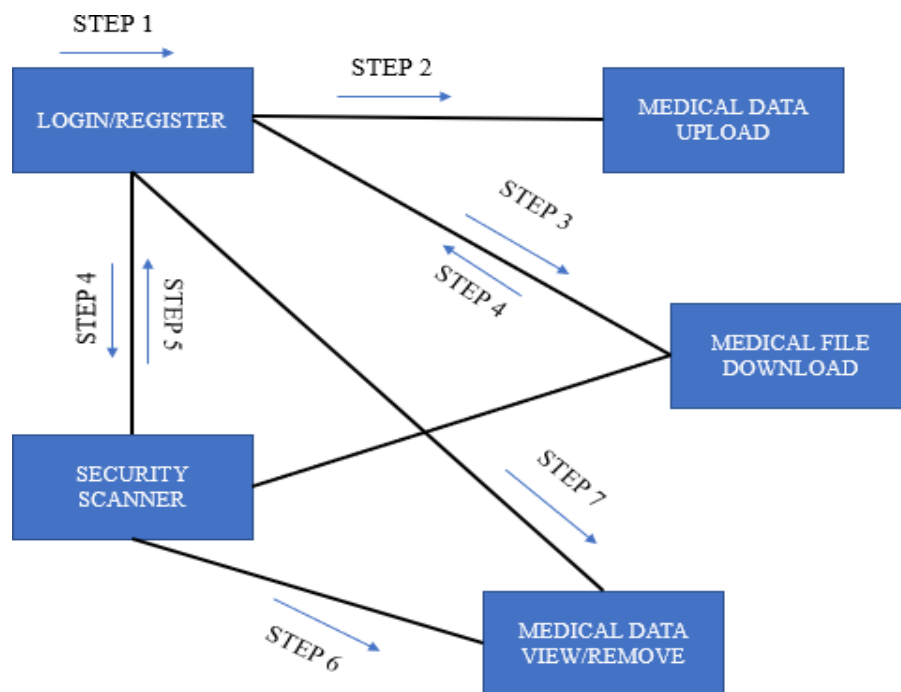


Fig 4.5 Component Diagram

Explanation

Component diagrams are used to describe the physical artifacts of a system. This artifact includes files, executable, libraries etc. So the purpose of this diagram is different, Component diagrams are used during the implementation phase of an application. But it is prepared well in advance to visualize the implementation details. Initially the system is designed using different UML diagrams and then when the artifacts are ready component diagrams are used to get an idea of the implementation. This diagram is very important because without it the application cannot be implemented efficiently. A well prepared component diagram is also important for other aspects like application performance, maintenance etc.

Organization can be further described as the location of the components in a system. These components are organized in a special way to meet the system requirements. As we have already discussed those components are libraries, files, executable etc. Now before implementing the application these components are to be organized. This component organization is also designed separately as a part of project execution.

COLLABORATION DIAGRAM

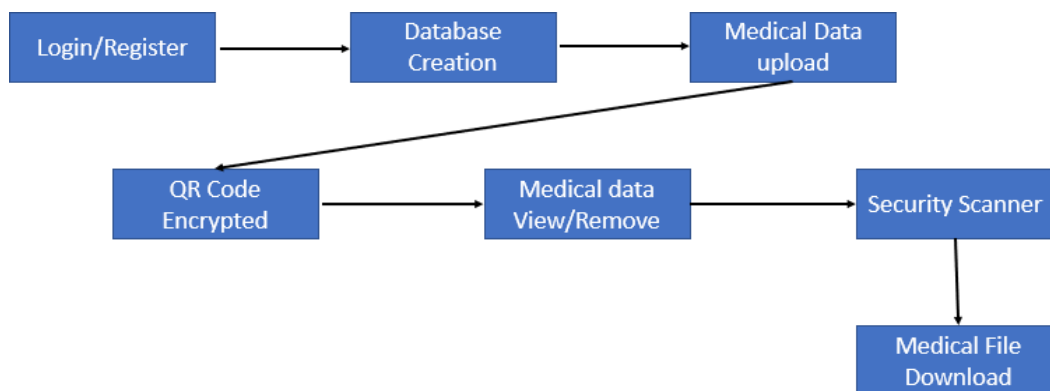


Fig 4.6 Collaboration Diagram

Explanation

The second interaction diagram is collaboration diagram. It shows the object organization as shown below. Here in collaboration diagram the method call sequence is indicated by some numbering technique as shown below. The number indicates how the methods are called one after another. We have taken the same order management system to describe the collaboration diagram. The method calls are similar to that of a sequence diagram. But the difference is that the sequence diagram does not describe the object organization whereas the collaboration diagram shows the object organization. Now to choose between these two diagrams the main emphasis is given on the type of requirement. If the time sequence is important then sequence diagram is used and if organization is required then collaboration diagram is used.

CHAPTER 5

DEVELOPMENT TOOLS

GENERAL

This chapter is about the software language and the tools used in the development of the project. The platform used here is ANDROID.

FEATURES OF ANDROID

HISTORY OF ANDROID

Android Inc. Founded in Palo Alto, California ,united states in October 2003 by Andy Rubin[co-founder of danger],rich miner[co-founder of wildfire communication Inc.],nick sears[once VP at T-Mobile], and Chris white[headed design and interface development at web TV] to develop.

WHAT IS ANDROID?

It is an open source software platform and operating system for mobile devicesBased on the Linux kernel Developed by Google and later the Open Handset Alliance (OHA) Allows writing managed code in the Java language Android has its own virtual machine i.e. DVM (Dalvik Virtual Machine), which is used for executing the android application. Google purchased the initial developer of the software, android incorporated in 2005.

OPEN HANDSET ALLIANCE

The open handset alliance (OHA) is a business alliance of firm to develop open standard for mobile devices. Devoted to advancing open standards for mobile devices Develop technologies that will significantly lower the cost of developing and distributing mobile devices and services.

OPEN HANDSET ALLIANCE (OHA) INCLUDED SEVERAL COMPANIES



ANDROID VERSION

- Android 1.0 (Angel Cake) - The first version of the open source software was released back in 2008
- Android 1.1 (Battenberg) - In Feb 2009, version 1.1
- Android 1.5 (Cupcake) - Launched in April 2009
- Android 1.6 (Donut) - released in September 2009
- Android 2.0 \ 2.1 (Éclair) - released in 26 October 2009
- Android 2.2 (Froyo) - released in the summer of 2010
- Android 2.3 (Gingerbread) - Gingerbread landed by the end of 2010
- Android 3.0 (Honeycomb) - For the first time Google released a software that was totally focused on tablets. This version, released in 2011

Android 4.0 (Ice Cream Sandwich 4.0) - released in 2012

Android 4.1 (jelly bean4.1)- released in 2013

Android 4.4 (KitKat) - released in 2014

Android 5.0 (Lollipop) - released in 2014

Android 6.0 (Marshmallow) - released in 2015

ANDROID ARCHITECTURE

The software stack is split into Four Layers:

- The application layer
- The application framework
- The libraries and runtime
- The kernel

SECURITY

Android is a multi-process system, in which each application (and parts of the system) runs in its own process. Most security between applications and the system is enforced at the process level through standard Linux facilities, such as user and group IDs that are assigned to applications.

- Android is designed having multi-layer security which provides flexibility for this platform. When attackers attempt attack on device, android platform help to reduce the portability of the attack.

There are key components of android security which are described as follows:

- Design review:-when a security model is designed then it will be reviewed by the developers so that risk level will be very less while using the model.
- Code review and penetrating testing:-the goal of this code review is that in which it will be checked that how the system will become strong?

- Open source and community review:-android uses open source technologies that have significant external review such as Linux kernel.
- Incident response:-android team enables the rapid mitigation of vulnerabilities to ensure that potential risks to all android users are minimized.

FEATURES OF ANDROID

- Background Wi-Fi location still runs even when Wi-Fi is turned off
- Developer logging and analysing enhancements
- It is optimized for mobile devices.
- It enables reuse and replacement of components.
- Java support ,media support, multi touch, video calling, multitasking ,voice based features, screencapture,camera,Bluetooth,Gps, compass and accelerometer,3G

ADVANTAGES

- The ability for anyone to customize the Google Android platform
- It gives you better notification.
- It lets you choose your hardware and It has better app market(1,80,000 application)
- A more mature platform
- With the support of many applications, the user can change the screen display.
- With Google chrome you can open many windows at once.
- Supports all Google services: Android operating system supports all of Google services ranging from Gmail to Google reader. All Google services can you have with one operating system, namely Android.

DIS-ADVANTAGES

- Android Market is less control of the manager, sometimes there are malware.
- Wasteful Batteries, This is because the OS is a lot of "process" in the background causing the battery quickly drains.
- Sometimes slow device company issued an official version of Android .
- Extremely inconsistence in design among apps.
- Very unstable and often hang or crash.

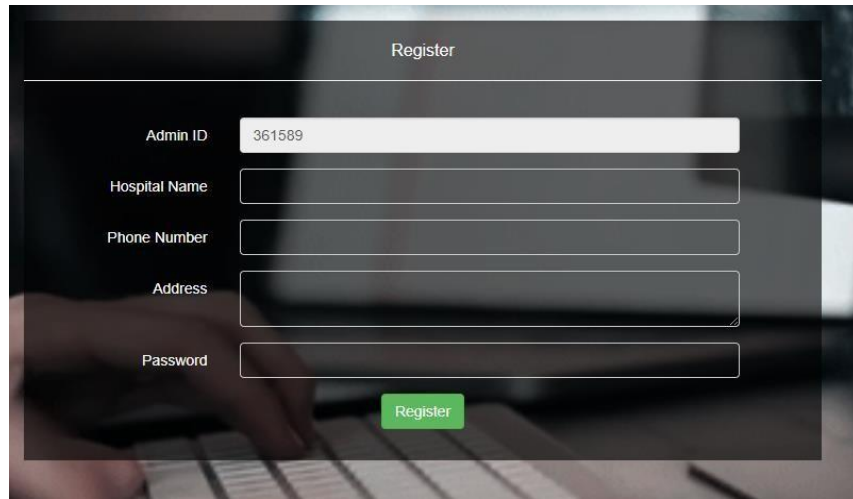
LIMITATIONS OF ANDROID

Development requirements in

- Java
- Android SDK
- Eclipse IDE (optional)
- Bluetooth limitations:-
 - Android doesn't support:
 - Bluetooth stereo
 - Contacts exchange
 - Modem pairing
 - Wireless keyboards
- Firefox mobile isn't coming to android because of android limitations
- Apps in Android Market need to be programmed with a custom form of Java
 - → Mozilla and the Fennec won't have that
- There are no split or interval times available.
- Small memory size.
- Continuous Internet connection is require

CHAPTER 6

RESULT AND DISCUSSIONS



The image shows a web form titled "Register". It contains several input fields: "Admin ID" with the value "361589", "Hospital Name", "Phone Number", "Address", and "Password". A green "Register" button is located at the bottom right of the form. The background is a blurred image of a person's hand typing on a keyboard.

Fig6.1 Registration page

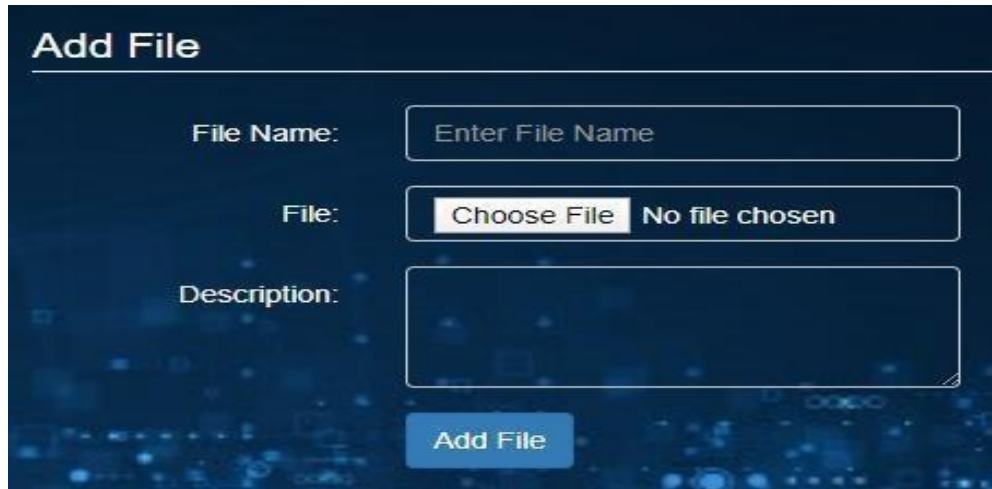
In this registration pages the hospital admin is used to enter the details of the hospital name, id, phone number, address and password of the admin and it is used to store in the database then only the admin can login with the id and password



The image shows a web form titled "Create Patient". It contains several input fields: "Patient ID", "Patient Name", "Gender" with radio buttons for "Male", "Female", and "Others", "Patient DOB" with a date format "dd-mm-yyyy", "Patient Email ID", "Patient Number", "Doctor Name", and "Treatment". A green "Add Patient" button is located at the bottom right of the form. The background is a blurred image of a medical history document.

Fig 6.2 Creating patient id

In this web page the admin is used to enter the details of the patient and the admin is used to give the different patient id to each patient and want to enter the name,gender, dob, email, number, doctor name and treatment and click on add patient then it used to store the data of the patient.

A web form titled "Add File" with a dark blue background. It contains three input fields: "File Name:" with a text box containing "Enter File Name", "File:" with a "Choose File" button and "No file chosen" text, and "Description:" with a large text area. An "Add File" button is at the bottom.

Add File

File Name:

File: No file chosen

Description:

Fig 6.3 Adding a file of a patient

In these web page the admin is used to store the file of a patient in a cloud and these file is accessed from anywhere in the presence of patient.

A card titled "Patient Details" with a blue background featuring a caduceus. It lists patient information: Patient Name (SUJEETH), Date Of Birth (1998-08-23), Email (girishnagakumar7@gmail.com), Phone (8919095298), Gender (female), Doctor Name (doctor), and Treatment (cancer). A QR code is on the right with the text "[Scan_Here]" below it.

Patient Details

Patient Name : SUJEETH
Date Of Birth : 1998-08-23
Email : girishnagakumar7@gmail.com
Phone : 8919095298
Gender : female
Doctor Name : doctor
Treatment : cancer


[Scan_Here]

Fig 6.4QRCode for Every Patient

These is used to give an all the details of the patient and the QR code for every. Whenever the patients scan the QR code it will access the data of a patient.

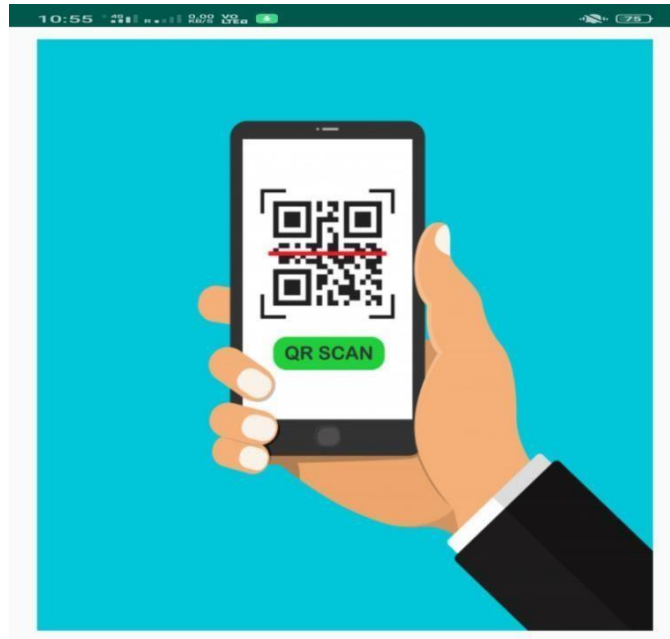


Fig 6.5 QR code scanning

In these android application the patient is used to scan the QR code then it send an OTP to that particular patient by entering it only it can access the data.

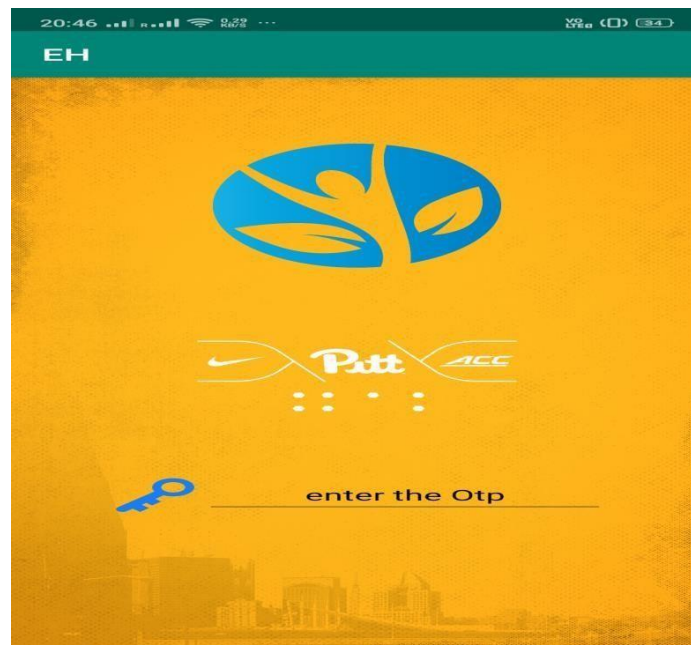


Fig 6.6 OTP verification

In these the patient is used to enter the correct OTP that which came to his mobile

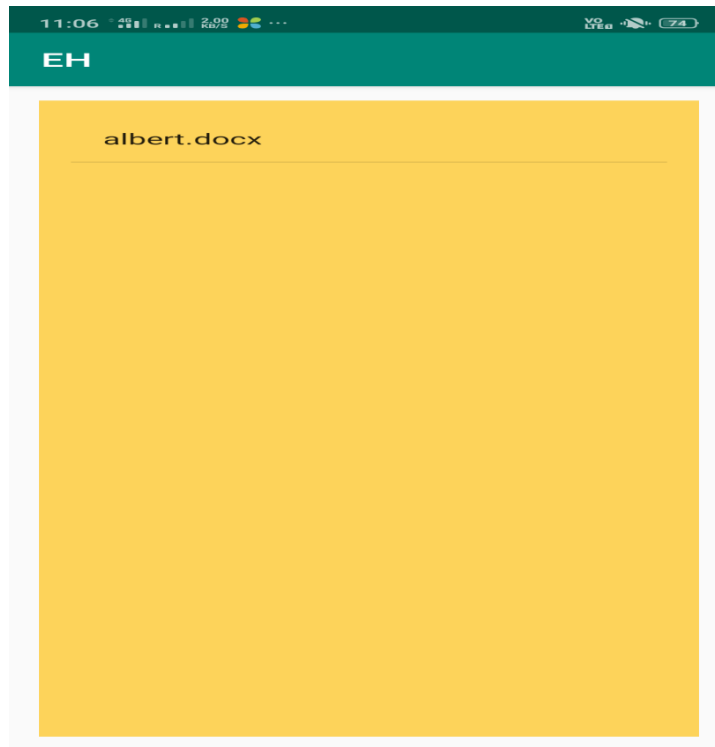


Fig 6.7 Patient Files

Whenever the patient enter the OTP then the screen appear as above then document that which can be downloaded and view by the patient.

CHAPTER 7

SOFTWARE TESTING

GENERAL

Cloud computing is a model for enabling ubiquitous, convenient, on demand network access to a shared pool of configurable computing resources. Since an Inter Cloud is a large scale distributed and interconnected computer system, interactions among its sub components (i.e. Clouds) and among stakeholders (i.e., consumers and Cloud providers) can be complex. In an Inter Cloud, computing resources owned and administered by different Cloud providers are pooled to serve multiple consumers, and applications and data are available to and shared by a broad group of cross enterprise and cross platform users. Inter Cloud resource pooling and sharing involve 1) combining resources through cooperation among Clouds, 2) mapping and scheduling shared resources through coordination, and 3) establishing contracts between Clouds and consumers, and among Clouds through negotiation.

DEVELOPING METHODOLOGIES

The test process is initiated by developing a comprehensive plan to test the general functionality and special features on a variety of platform combinations. Strict quality control procedures are used.

The process verifies that the application meets the requirements specified in the system requirements document and is bug free. The following are the considerations used to develop the framework from developing the testing methodologies.

TYPES OF TESTING

Unit Testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program input produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of

its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration.

Functional Testing

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures: interfacing systems or procedures must be invoked.

System Testing

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

Performance Testing

The Performance test ensures that the output is produced within the time limits, and the time taken by the system for compiling, giving response to the users and request being send to the system for to retrieve the results.

Integration Testing

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Acceptance testing for Data Synchronization:

- The Acknowledgements will be received by the Sender Node after the Packets are received by the Destination Node
- The Route add operation is done only when there is a Route request in need
- The Status of Nodes information is done automatically in the Cache Updation process

Build the Test plan

Any project can be divided into units that can be further performed for detailed processing. Then a testing strategy for each of this unit is carried out. Unit testing helps to identify the possible bugs in the individual component, so the component that has bugs can be identified and can be rectified from errors.

CHAPTER 8

CONCLUSION AND FUTURE ENHANCEMENT

CONCLUSION

- The medical information system is continuously evolving. One of the most important future development is likely to be the saving of medical records to electronic media, rather than the paper records currently used in most hospitals.
- In the prescription transfer system environment, the patient profile, prescription details, and examination results are saved as text and utilized during treatment.
- Besides, it constructs the more advanced EMR by entering the doctor's prescription record only into the computer.
- Identification in the EMR system, which utilizes important personal information, is the most important security factor that decides the right of access to the EMR system, and the access right of the medical personnel concerned.

FUTURE ENHANCEMENTS

- The medical information system is continuously evolving. One important future development is likely to be the saving of medical records to electronic media, rather than the paper records currently used in most hospitals.
- In the prescription transfer system environment, the patient profile, prescription details, and examination results are saved as text and utilized during treatment.
- Besides, it constructs the more advanced EMR by entering the doctor's prescription record only into the computer.
- Identification in the EMR system, which utilizes important personal information, is the most important security factor that decides the right of access to the EMR system, and the access right of the medical personnel concerned.

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APPENDICES

A. SOURCE CODE

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Hospital</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="bootstrap/css/bootstrap.min.css">
<scriptsrc="bootstrap/js/jquery.min.js"></script>
<scriptsrc="bootstrap/js/bootstrap.min.js"></script>
<link href="css/style.css" rel="stylesheet">
<style>
    /* Remove the navbar's default margin-bottom and rounded borders */
    .navbar {
margin-bottom: 0;
border-radius: 0;
    }

    /* Add a gray background color and some padding to the footer */
    footer {
background-color: #f2f2f2;
padding: 10px;
    }

    .carousel-inner img {
width: 100%; /* Set width to 100% */
margin: auto;
min-height:200px;
    }

    /* Hide the carousel text when the screen is less than 600 pixels wide */
    @media (max-width: 600px) {
        .carousel-caption {
display: none;
        }
    }

    .regg
    {
background-image: url('image/giff.gif');
```

```

background-repeat: no-repeat;
background-attachment: fixed;
background-position: center;
background-size:100% 100%;
    }
    .rj
    {
background-color:#0000009e;color:white;
    }

```

```

label{color:white;}

```

```

</style>

```

```

</head>

```

```

<body class="regg">

```

```

<nav class="navbarnavbar-inverse">

```

```

<div class="container-fluid">

```

```

<div class="navbar-header">

```

```

<button type="button" class="navbar-toggle" data-toggle="collapse" data-
target="#myNavbar">

```

```

<span class="icon-bar"></span>

```

```

<span class="icon-bar"></span>

```

```

<span class="icon-bar"></span>

```

```

</button>

```

```

<a class="navbar-brand" href="index.php">Hospital</a>

```

```

</div>

```

```

<div class="collapse navbar-collapse" id="myNavbar">

```

```

<ul class="nav navbar-nav">

```

```

<li><a href="index.php">Home</a></li>

```

```

<li><a href="#">About</a></li>

```

```

<li><a href="#">Contact</a></li>

```

```

</ul>

```

```

<ul class="nav navbar-nav navbar-right">

```

```

<li><a href="register.php"><span class="glyphicon glyphicon-log-in"></span>
Register</a></li>

```

```

    <li><a href="login.php"><span class="glyphicon glyphicon-log-
in"></span> Login</a></li>

```

```

</ul>

```

```

</div>

```

```

</div>

```

```

</nav>
<br />
<?php
    require('config.php');
    function get_rand_id($length)
    {
        $str_result = '0123456789';
        $rand_id = substr(str_shuffle($str_result),0, $length);
return $rand_id;
    }
    $rand = get_rand_id(6);
    if(isset($_POST['register'])){
        $hosid = $_POST['hosid'];
        $hosname = $_POST['hosname'];
        $phone = $_POST['phone'];
        $address = $_POST['address'];
        $pass = $_POST['pass'];

        $query = "INSERT INTO `register` (`hosid`, `hosname`, `address`,
`phone`, `password`)VALUES ($hosid,'$hosname','$address',$phone,'$pass')";
        $sql = mysqli_query($con, $query);
        if($sql){
            echo "<script>alert('Register Successfully');</script>";
        }else{
            echo "<script>alert('Data has not Register');</script>";
        }
    }
?>
<div class="container">
<div class="row">
<div class="col-md-2"></div>
<div class="col-md-8 text-center">
<div class="rj panel-default">
<div class="clearfix" style="background-color:transprant;color:white;">
<i class="icon-calendar"></i><br>
<h3 class="panel-title">Register</h3><hr>
</div>

<div class="panel-body ggii">
<form class="form-horizontal row-border" method="post">

```

```

<div class="form-group">
<label class="col-md-3 control-label">Admin ID</label>
<div class="col-md-8">
<input type="text" value="<?php echo $rand;?>" class="form-control" disabled>
<input type="hidden" name="hosid" value="<?php
echo $rand;?>" class="form-control ffrmm">
</div>
</div>
<div class="form-group">
<label class="col-md-3 control-label">Hospital Name</label>
<div class="col-md-8">
<input class="form-control ffrmm" type="text" name="hosname">
</div>
</div>

<div class="form-group">
<label class="col-md-3 control-label">Phone Number</label>
<div class="col-md-8">
<input class="form-control ffrmm" type="tel" pattern="\d{10}$" name="phone">
</div>
</div>

<div class="form-group">
<label class="col-md-3 control-label">Address</label>
<div class="col-md-8">
<textarea class="form-control ffrmm"
name="address"></textarea>
</div>
</div>

<div class="form-group">
<label class="col-md-3 control-label">Password</label>
<div class="col-md-8">
<input class="form-control ffrmm" type="password" name="pass">
</div>
</div>

<div class="form-group">
<input type="submit" name="register" class="btn btn-
success" value="Register">
</div>
</form>

```

```

</div>
</div>
</div>
</div>
<div class="col-md-2"></div>

</div>

</body>
</html>

<?php
$con=mysqli_connect('localhost','root','','ehr');
// $con = mysqli_connect('localhost','root','','hospital');
?>

```

```
package com.example.eh;
```

```

import android.app.Activity;
import android.app.AlertDialog;
import android.content.Context;
import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.text.Editable;
import android.text.TextWatcher;
import android.util.Log;
import android.widget.EditText;
import android.widget.Toast;

```

```

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

```

```

public class otp extends Activity {
    String pass,userId,mobno;
    EditText password;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login);
    }
}

```

```

        password=(EditText)findViewById(R.id.editText1);
        password.setHint("enter the otp");
        Intent i=getIntent();
        userid=i.getStringExtra("userid");

        new loginquery(otp.this).execute();

        password.addTextChangedListener(new TextWatcher() {

            @Override
            public void onTextChanged(CharSequence s, intstart, intbefore, intcount)
            {
                // TODO Auto-generated method stub
                if(pass.length()==password.getText().toString().length())
                {
                    if(password.getText().toString().matches(pass))
                    {
                        Intent i=new Intent(otp.this,Download.class);
                        i.putExtra("userid", userid);
                        i.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TASK);
                        i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK);
                        i.addFlags(Intent.FLAG_ACTIVITY_NO_ANIMATION);
                        startActivity(i);
                        overridePendingTransition(R.anim.anim_slide_in_left,
                        R.anim.anim_slide_out_left);

                    }
                }
            }

            else
            {
                password.setError("INVALID OTP");
                Toast.makeText(getApplicationContext(), "INVALID PASSWORD", 3000).show();
            }
        }

    }

    @Override
    public void beforeTextChanged(CharSequence s, intstart, intcount,
    intafter) {
        // TODO Auto-generated method stub

    }

    @Override
    public void afterTextChanged(Editable s) {

```

```

// TODO Auto-generated method stub

}

});
}
class loginqueryextends AsyncTask<String, String, String>

{
    String id ;
    String filetype;
    String fulename;
    String spinn;

    int wchecker=0;
    ProgressDialog pd ;
    private Context _context;
    private JSONArray examdetails;
    public loginquery(Context context) {
        _context = context;
    }
    @Override
    protected
        void onPreExecute(){
            // create dialog here
            pd = new ProgressDialog(_context);
            pd.setTitle("Data Processing");
            pd.setMessage("Please wait...");
            pd.setCancelable(false);
            pd.setIndeterminate(true);
            pd.show();

        }
        @Override
        protected String doInBackground(String... params)
        {
            // TODO Auto-generated method stub

            // _____web request_____
            ServiceHandler sh = new ServiceHandler();//calling service handler method

            String url="http://www.androidtestprojectss.xyz/IEEEPROJECTS2018-2019/Auditing/otpgenerate.php?id="+userid;
            Log.i("Response: ", url);

            String jsonStr = sh.makeServiceCall(url, ServiceHandler.GET);

```

```

Log.i("Response jsonstr: ", jsonStr);

//_____WEB RESPONCE VALIDATION_____
JSONObject json_data;

try
{
    //_____Iniatializingjson object_____
    json_data = new JSONObject(jsonStr);
    //_____Iniatializingjson array_____
    String Success=json_data.getString("success");
    if(Success.matches("1"))
    {
        wchecker=1;
        pass=json_data.getString("otp");
        mobno=json_data.getString("mobno");
    }
    else
        wchecker=0;

    } catch (JSONException e) {
    // TODO Auto-generated catch block
    e.printStackTrace();

    }

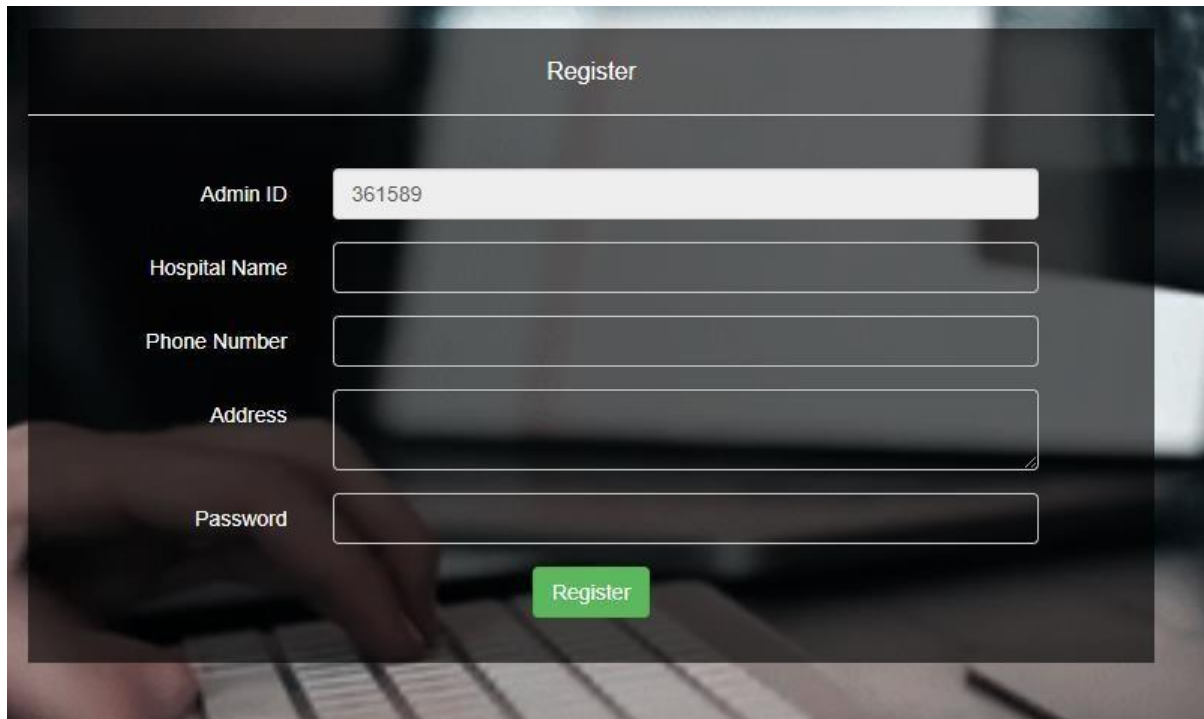
return null;
}

@Override
protected void onPostExecute(String result) {
    pd.dismiss();
    SmsManagersmsManager = SmsManager.getDefault();
    smsManager.sendMessage(mobno, null, "YourOneTimePassword(OTP) for e-
    medical is"+pass, null, null);

    }
}

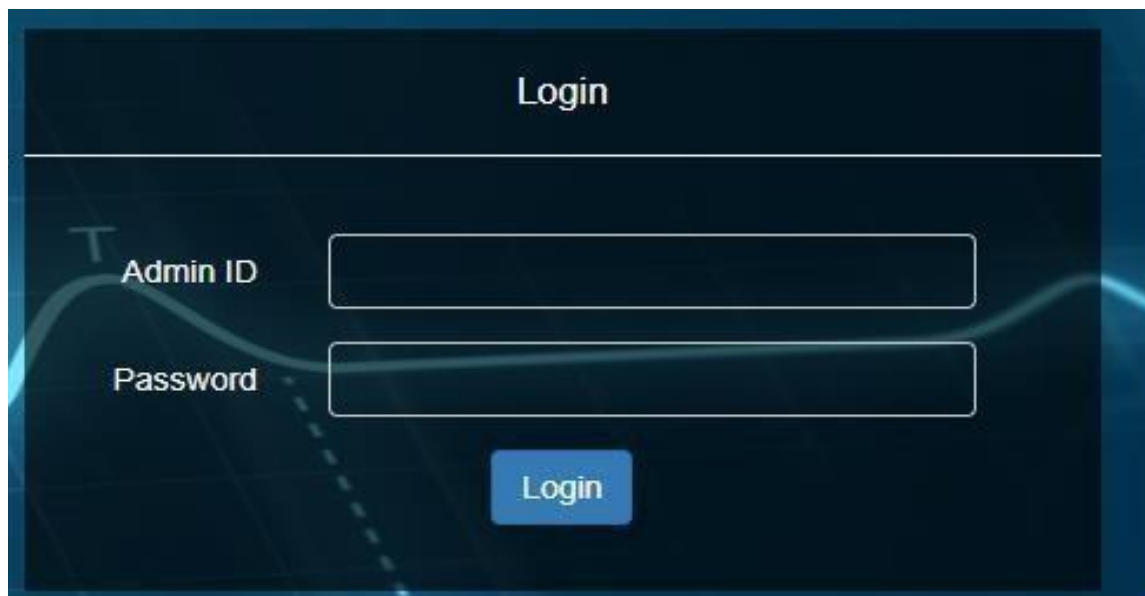
```

B.SCREENSHOTS



A screenshot of a web application's registration page. The page has a dark background with a blurred image of a person's hand typing on a keyboard. At the top, the word "Register" is centered in a white font. Below it, there are five input fields arranged vertically, each with a label to its left: "Admin ID" (containing the text "361589"), "Hospital Name", "Phone Number", "Address", and "Password". At the bottom center, there is a green rectangular button with the word "Register" in white text.

Register page



A screenshot of a web application's login page. The page has a dark blue background with abstract light blue and white wavy lines. At the top, the word "Login" is centered in a white font. Below it, there are two input fields arranged vertically, each with a label to its left: "Admin ID" and "Password". At the bottom center, there is a blue rectangular button with the word "Login" in white text.

Login page

Create Patient

Patient ID

Patient Name

Gender ☐ Male ☐ Female ☐ Others

Patient DOB

Patient Email ID

Patient Number

Doctor Name

Treatment

Creating patient

Add File

File Name:

File: No file chosen

Description:

Uploading a file

Search Submit											
No	Name	Genter	DOB	Email	Phone	Doctor Name	Treatment	Update	File Upload	Delete	QrCode
36110389	sujeeth	female	1998-08-23	nataliya.herus@gmail.com	9874563210	doctor	cancer		File Upload		

View patient

Patient Details

Patient Name : SUJEETH

Date Of Birth : 1998-08-23

Email : girishnagakumar7@gmail.com

Phone : 8919095298

Genter : female

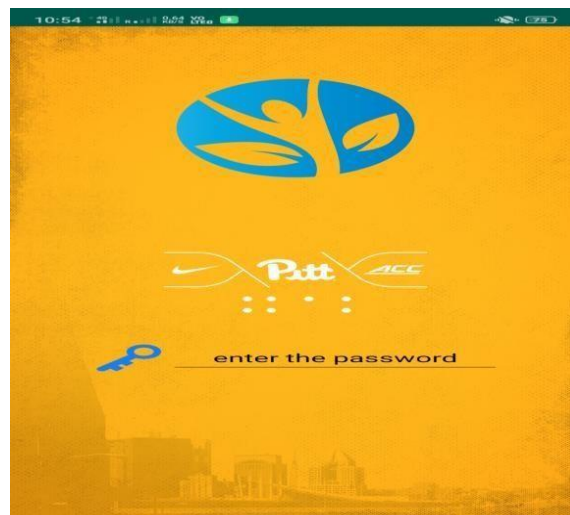
Doctor Name : doctor

Treatment : cancer

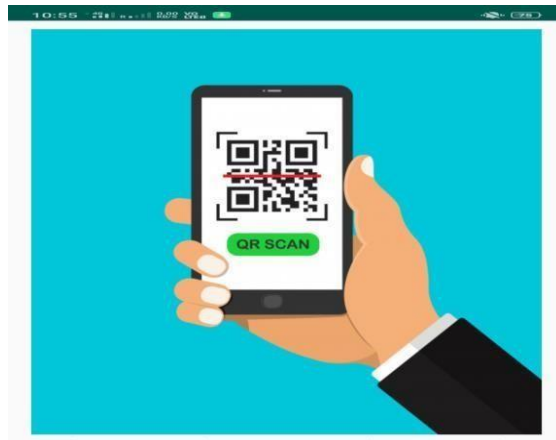


[Scan_Here]

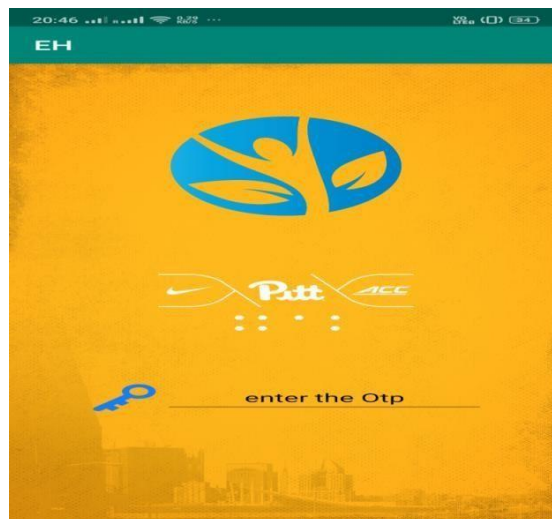
QR code of a patient



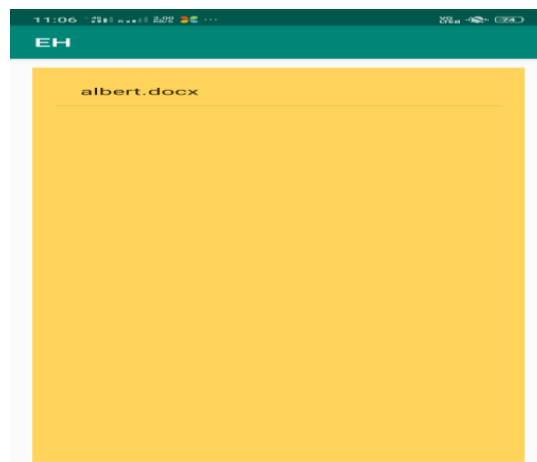
Enter the password



Scan QR code



OTP verification



Downloading file

DELEGATED AUTHORIZATION FRAMEWORK FOR EHR SERVICES USING QR CODE BASED ENCRYPTION

¹G. Narendra, ²G. Sujeeth, ³Dr.J.Albert Mayan

¹gonanarendraredy94@gmail.com, ²sujeethreddy30@gmail.com, ³ albertmayan@gmail.com

^{1,2}Student, ³Professor,

Department of Computer Science and Engineering, Satyabhama Institute of Science and Technology,
Chennai-600119

ABSTRACT: *The point of this examination is to investigate the intentions belated the appropriation or dismissal of Electronic Health Records (EHR) frameworks in the USA by narcotic workplaces. The goal is to lessen excess and increment quality by sharing medical data among various wellbeing associations like emergency clinics, doctor workplaces, labs and medical organizations. The achievement of such change requires the cooperation and coordinated effort of every one of these substances and their resigned. Earlier testing conveys that selection of Electronic Medical Records frameworks by clinics and doctor workplaces has been clear however at a degree that is slower than in different nations. Beside money related hindrances, specialized, mental, social/legitimate and hierarchical boundaries exist. So as to Understand these effect we make our task. The primary objective of our undertaking is to plan a versatile application for patients through online application the board that gains secure access to understanding records through distributed storage administration. Administrator can remotely store persistent data in to the cloud with sheltered and make sure about distributed storage through a Patient can without much of a stretch access their information which are put away in cloud dependent on EHR Service the board. Remote information respectability of wellbeing record is proposed to ensure the uprightness of the made sure about information put away in the cloud. In some regular distributed storage frameworks, cloud document may contain some delicate data. Encoding the entire shared record can understand the sensitive data concealing, however will make this mutual record unfit to be used by others. Right now, propose a remote report reference id consequently convert to the QR code then simply filter client module at that point download the specific record respectability that acknowledges information offering to delicate data covering up. Marks are utilized to check the document in the period of honesty wellbeing records.*

I INTRODUCTION

In the current scenario health information technology performs in various methods and specifications. So, this paper talks about various obstacles for implementation of electronic record system in doctor practices. The meaning of electronic frame work differs from one specification to other supported quite work and desire from the framework. So, the

definition and usage of the framework varies from one applicant merchant to other. Electronic Medical Records (EMR) and Electronic Health Records are most essential frameworks for storing patient's information. The EHR is about quality, safety, and efficiency. It is great tool for physicians, but cannot ensure these virtues in isolation. Achieving the true benefits of EHR systems requires the transformation of practices, based on quality improvement methodologies,

system and team-based care, and evidence-based medicine. The details include meanings of the voltaic frameworks vary starting with one foundation then onto the next dependent on every one's kind of effort include desires from the framework. The determinations and settling likewise vary starting with one application merchant then onto the next. The orders of these frameworks are discretionary as yet. The most well-known names to human services records the executives' frameworks are Electronic Medical Records (EMR) and Electronic Health Records (EHR). Despite the fact that the pair are regularly utilized conversely, there live a separation in the middle of duo. Comment on [1] has recognized more than decade distinctive advanced wellbeing and preventive put down the executives frameworks that own exists the issue of scholarly investigations considering dyad decagon. Electronic Patient Record (EPR) framework and Computerized Patient Record (CPR) framework allude to a computerized or advanced log about a solitary victim mid sole specific emergency clinic either more disinfectant establishment [1]. likewise has a particular spotlight on the sort of medical information they stock. The US administration alludes to the thermionic plea for overseeing and following wellbeing and medicinal list as Electronic Health Record (EHR) framework. The administration's desire for an EHR is to bring down the expense of preventive consumption. EHR perhaps bring down consumption in the event that it makes giving and handling medical consideration increasingly effective by disposing of superfluous doctor visits, enabling specialists to analyze a patient remotely, overseeing medicines and medication satisfaction quickly, distinguishing early indications of sicknesses, and giving consideration conveyance associations a complete account about some sufferer to have the option to settle on blow disinfectant choices in the absence of delivering redundant medical

methods and managerial capacities. That kind of wellbeing data innovation requires the participation and coordinated effort of fully CDOs from the general population along with personal segments.

Dissimilar to EHR, an EMR is a complete mechanized tonic information archive framework possessed by alone [2]. For dealing with their EMR, a CDO will rely upon a medical information store gave by a solitary association. in the time an EMR be allowed get a natural spotlight on cathartic consideration, it imparts significant normal fact and order to EPR. For improvement and combination plan, the title EMR while utilized right now allude into some modernized forbearing tonic witness the executive's framework that is occupy, refreshed, altered, followed, and oversaw at a solitary for that association's inward cause. EMR is an entreaty domain made out of the medical information archive, medical choice help, controlled medical jargon, request passage, modernized supplier request section, drug store, and medical proof request [2]. An EHR is an extensive mechanized evidence considering single valetudinarian and permits tolerant info and surge [2]. Interest is made out of numerous alleviating jacket. An EHR's prosperity is firmly subject to information trade between EMR adopters that is continuous and finish. As opposed to the vends comprehension of EMR and EHR framework, differentiation midway the banal is obligatory for appropriate comprehension of the degrees of reception, execution and dispersion of every, which has its effect on assessing an exact advancement of the social insurance change arrangement

A cloud alludes to a domain that is intended with the end goal of remotely provisioning versatile and estimated IT assets. Where the system giving remote access to a lot of decentralized IT assets. The thought behind the venture is to plan a versatile application for

Data Sharing through circulated capacity administration customer can remotely store there data to the cloud and comprehend the data offering to different elements which additionally contains some touchy information. The delicate data ought to guarantee it is recovered by the validated client when the cloud record is shared. Right now, sanitizer is utilized to disinfect the data comparing to record and changes these data's stamps in authentic ones for the disinfected document. These marks are used to check the integrity of the cleaned data in the time of uprightness surveying.

In information sharing between two substances in cloud one section medical clinic the board to treat as the administrator part and afterward patient to treated as the client part. Administrator to transfer the medical record in our cloud (Data and patient ID) at that point search the specific patient id and medical archive reference id naturally convert to the QR code then simply filter client module at that point download the specific report. The principle advantage is to have more made sure about change between different sides, increasingly adaptable, simple access; at long last we can download the record as a free report. In existing framework, they have utilized RFID innovation which isn't reasonable for progressively reasonable information putting away and not minimized for all divisions. There are numerous associations and people who may get a kick out of the chance to store their information in the cloud. Nonetheless, the information put away in the cloud may be debased or lost because of the unavoidable programming bugs, equipment flaws and human blunders in the cloud Providing Security for the medical archive utilizing QR code base Android application. Where User can store their reports in cloud Which will be changed over into QR code which can be downloaded by the specific individual who have picked up the entrance to the archive

and they can impart it to the relating substances. This brings the trust commendable among the clients to transfer their index in cloud where administrator transfers the archive along the reference id which at that point consequently creates the QR code.

II RELATED WORK

[5]. This can be credited to the flexibility, significant level of accessibility, and diminished expense of cloud administrations. Right now, there are various cloud-based EHR administrations, together with CureMD 4, operation heating 5 and unhealthy 6. Associations like GE preventive medicine 7 and History energy Solutions 8 are additionally putting resources into cloud-based EHR administrations. Different testing endeavors have been recommended with significant spotlight on safe, cloud-based EHR frameworks. Different specialists have additionally proposed confided in registering utilizing SGX processors for Cloud security [9], [10]. In any case, most of the bid address are insufficient in ensuring a complete out flow charge and inscribe component. Alongside this, most accessible appeal is authorized and therefore costly to receive. Right now, open-source, minimal effort EHR overseeing application should be built up that can ensure refined levels of information security and assurance. Through the EHR Manager approach, this exploration exertion attempts to fabricate such an answer by utilizing all open code improvement apparatuses separated from the outsider cloud administrations.

The EHR chief is an open-source device which gives a simple attachment to medical hands just as patients to see and additionally alter the EHR. Inherit, this appeal ensures solid gale domination and information insurance system. The Health Insurance transportability and reporting Act of 1996 gives information protection, reliability and shielding represents

ensuring electronic medical data of people [5], [6]. HIPAA gives rules to electronic medical record the board for offsetting singular security as for medical records alongside the need to ensure strength of the majority. The Health data innovation for monetary and clinical health act towards keeping up electronic clinical records by ensuring quality, wellbeing, productivity, protection and security [4].

Conforming to the permissible of overseeing medical proceedings and simultaneously building up a simple to-utilize electronic wellbeing record framework turns into a significant innovative work challenge. There exist numerous EHR the board instruments like GE Healthcare, Epic, CureMD and so on which offer HER types of assistance utilizing distributed computing. Already, we built up linguistics rich ingress manage model dependent on Attribute Based Access Control (ABAC) [16]. This model assessed an entrance choice dependent on the qualities of the client mentioning an archive and those of the mentioned report. We planned and executed a philosophy to exhibit the utilization of ABAC in an authoritative setting. Access control choices were assessed against a hierarchical classification strategy.

This work showed the utilization of arrangement based, semantic web approach of actualizing ABAC at a report quantity. The framework has been boost to assess an entrance choice on the fields of an archive instead of the whole record. The refine framework would now be able to classify the allowed access rather than only a twofold choice. Aside from this, the recently evolved framework showed the idea of perimeter registering [17] where the authoritative limit was viewed as the edge of the framework. The cloud specialist organization was examined as an doubting substance and in this way lied underneath the hierarchical edge. All data exchanges in the middle of the

hierarchical limit and the cloud were encoded utilizing an unaware Storage and the unaffected RAM [18], [19]], darkening the entrance designs between the association and the cloud specialist organization.

Different entry charge copy have been suggest, including essential gain leadership, Role Based flood rule [20], and numerous others. Jin et. al. characterized the Attribute Based Access Control (ABAC) model, which supports highlights of the prior access control models [21]. The EHR Manager utilizes the CPABE toolbox to model the examination exertion. ABE has been one of picked advancements for electronic wellbeing record the executives frameworks too Akinyele et. al [20] have introduced a structure and execution of Electronic Medical Records (EMRs) utilizing property-based hide on cell phones. In their framework, they give disconnected help to refreshing the medical records with help for inevitable consistency. In any case, their model doesn't bolster a field-level conceal of the EHR. Analysts at Microsoft built up a patient controlled electronic medical record framework with trait-based cipher. As the name recommends, this framework put all the entrance power lies in patients hands. The command and dispersion of key sequence was the patients obligation. Be that as it may, this methodology requires an elevated level of authority adopt on the patients end. The EHR Manager be that as it may, doesn't force any overhead on the patient. The focal framework handles all the secure sequence and circulation of the EHR.

III EXISTING SYSTEM

The Existing idea is an appropriate approval assignment system to utilize cloud-based EHR Service the executives utilizing Attribute Based Encryption (ABE) in web advancements that includes the mix of utilizing

semantic web method with properties based plans. Quality Based Encryption (QBE) utilized in existing framework. Standard build conceal is a style of open key cipher where the puzzle key of a market and the particular fulfilled are reliant upon characteristics. Address where the EHR information approval must be affirmed by the patient. This isn't pragmatic in each situation and additionally the patient may not be in a state to give this approval when need. Subsequently there is a demand to build up an approval appointment system where by the patient approves the supplier entry to his/her EHR and the supplier thus assigns this approval to suitable representatives or associates to get to the information. Customary job based access models won't fill in as the cloud based EHR frameworks can be gotten to from any area and from any gadget. So notwithstanding the guardian's jobs, their different qualities, similar to area, time, obligation period, and so on., can likewise impact the appointed approval. We have built up a novel, brought together, quality based approval component for EHR offices that utilizations Attribute Based Code and takes into consideration assigned solid path of serene records. This system moves the administration the board insurance from the tranquil to the healing association and permits simple assignment of cloud established EHRs get to power to sedative suppliers..

IV PROPOSED SYSTEM

Right now propose a remote archive reference id naturally convert to the QR code then simply examine client module at that point download the specific record uprightness that acknowledges information imparting to touchy data stowing away. Marks are utilized to confirm the document in the period of trustworthiness wellbeing records. In information sharing between two substances in

cloud one section medical clinic the executives to treat as the administrator part and afterward patient to treated as the client part. Administrator to transfer the medical record in cloud (Data and patient ID) at that point search the specific patient id and medical archive reference id consequently convert to the QR code then simply examine client module at that point download the specific report. The principle advantage is to have more made sure about progress between different sides, increasingly adaptable, simple access; at long last we can download the Document as a free report. A sanitizer is utilized to clean the information squares containing any touchy data of the record and changes these information squares' marks into acceptable ones for the sterilized document. These marks are exploit to check the respectability of the strain record in the phase of uprightness of QR code create Algorithm. QR code ends up being unreasonably costly for some applications when contrasted with other following and recognizable proof techniques, for example, the basic standardized tag.

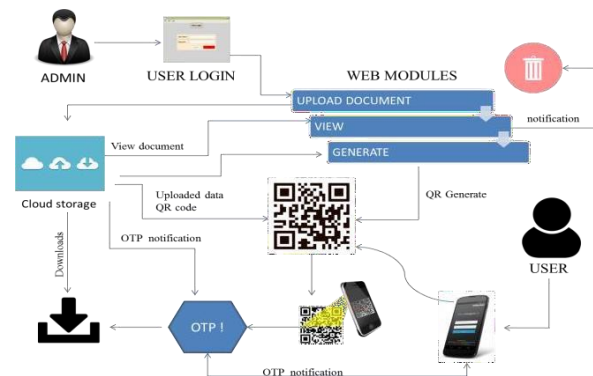


FIG 1 OVERVIEW OF THE PROPOSED SYSTEM

MODULES DESCRIPTION

LOGIN AND REGISTRATION

In these module there is a login and enrollment structure. In these enrollment structure we need to enlist by utilizing username or email id. Furthermore, we need to login with the equivalent username or email id then just it will login else it won't.

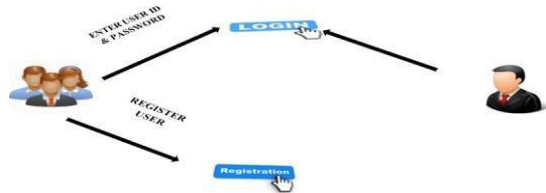


FIG 2 LOGIN AND REGISTRATION

DATABASE CREATION

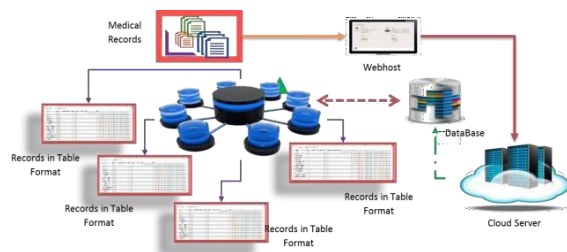


FIG 3 DATABASE CREATION

Client email id or name and secret key are put away in these SQLite database for putting away and bringing client application structure

MEDICAL INFORMATION TRANSFER

Right now, transfer the client data away cloud in secure information are client data, Medical record data and patients subtleties and so on....

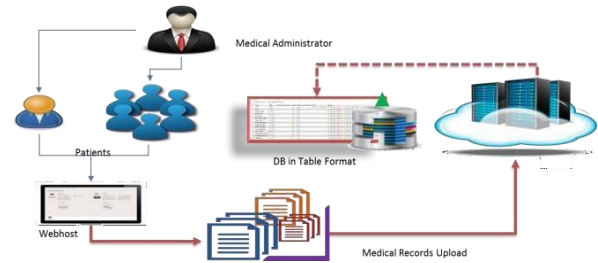


FIG 4 MEDICAL INFORMATION TRANSFER

QR CODE ENCRYPTION

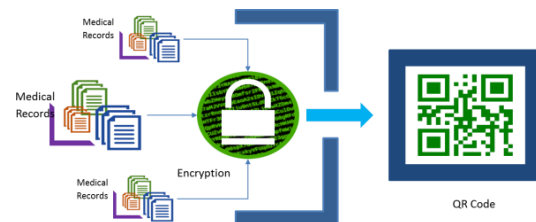


FIG 5 QR CODE ENCRYPTION

Right now, have made a QR code produce an utilizing Encrypt the worth like medical records information and patients subtleties that can be make are login clients.

MEDICAL DATA SEE/REMOVE

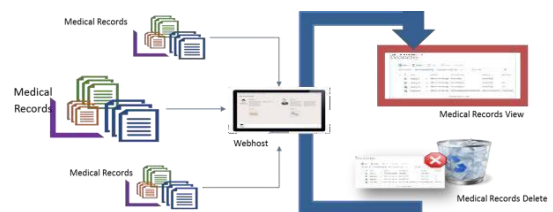


FIG 6 MEDICAL DATA SEE/REMOVE

Right now, information see/expel that procedure can be utilized on logged client see a medical information and incase that information can evacuate. Be that as it may, unique qualities not erase in perpetual.

SECURITY SCANNER

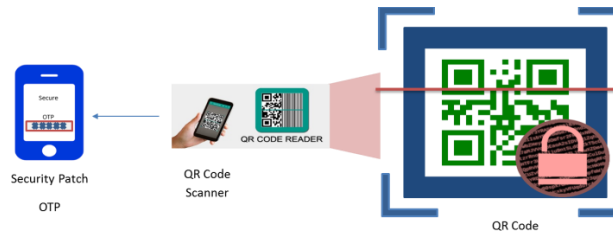


FIG 7 SECURITY SCANNER

Right now security scanner like the three security can be utilizing the tasks are security fix, one of a kind QR code Reader and Make QR code that specific individual can be utilized in application.

MEDICAL FILE DOWNLOAD

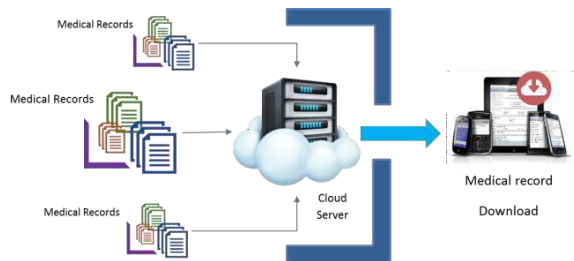


FIG 8 MEDICAL FILE DOWNLOADS

We need to make a medical document download are in general information put away in cloud the particular client medical record finds to see and download the specific client records.

VI RESULT AND DISCUSSION

REGISTRATION PAGE

FIG 9 REGISTRATION PAGE

In these registration page the hospital admin is used to enter the details of the hospital name, id, phone number, address and password of the admin and it is used to store in the database then only the admin can login with the id and password.

CREATING PATIENT ID

FIG 10 CREATING PATIENT ID

ADDING A FILE OF A PATIENT

In these web page the admin is used to store the file of a patient in a cloud and these file is accessed from anywhere in the presence of patient.

FIG 11 ADDING A FILE OF A PATIENT

QR CODE FOR EVERY PATIENT

These is used to give a all the details of the patient and the qr code for every. Whenever

the patient scan the qr code it will access the data of a patient.



FIG 12 QR CODE FOR EVERY PATIENT

QR CODE SCANNING

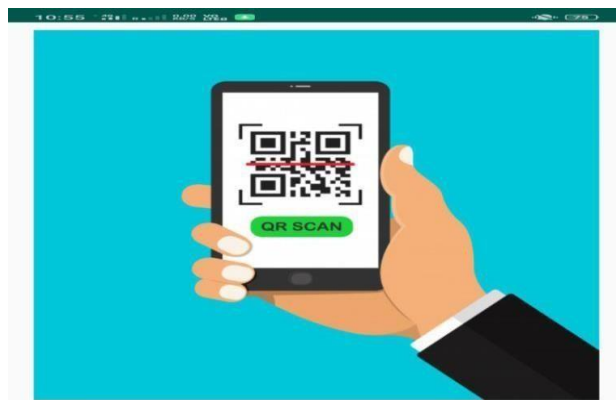


FIG 13 QR CODE SCANNING

In these android application the patient is used to scan the qr code then it send an otp to that particular patient by entering it only it can access the data.

OTP VERIFICATION

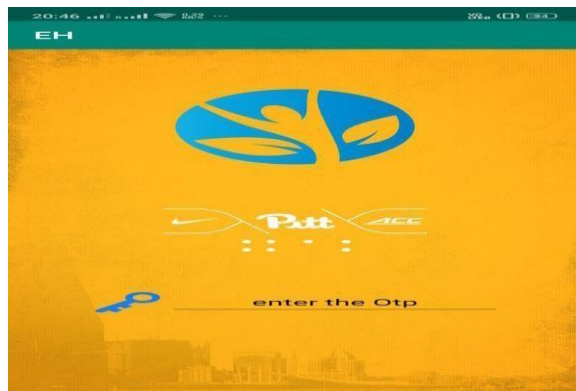


FIG 14 OTP VERIFICATION

In these the patient is used to enter the correct otp that which came to his mobile.

PATIENT FILES

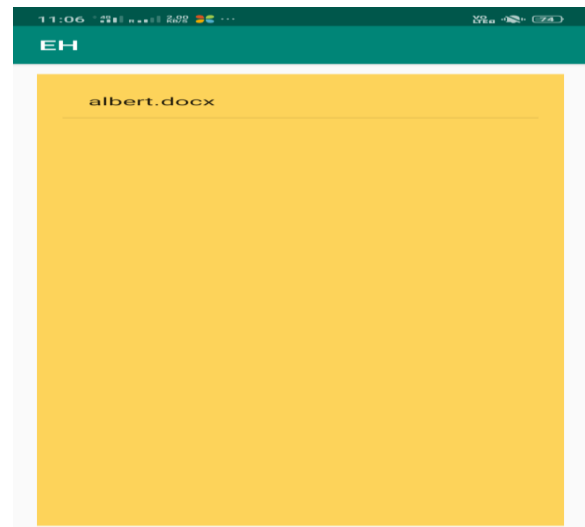


FIG 15 PATIENT FILES

VI CONCLUSION

The medical data framework is ceaselessly developing. One significant future advancement is probably going to be the sparing of medical records to electronic media, as opposed to the paper records presently utilized in many medical clinics. In the remedy move framework condition, the patient profile, solution subtleties, and assessment results are spared as content and used during treatment. Plus, it develops the further developed EMR by entering the specialist's solution record just into the PC. Distinguishing proof in the EMR framework, which uses significant individual data, is the most significant security factor that chooses the privilege of access to the EMR framework, and the entrance right of the medical faculty concerned. The open level QR code can be perused by any QR code understanding application. In any case, the private level QR code needs a particular application with explicit info data. Also, this private level QR code is made by supplanting dark modules alongside

some particular finished examples. Any standard QR code peruser consider the finished example as a dark modules in this manner the private level is imperceptible to standard QR code perusers and this private level QR code doesn't influence any of the open levels.

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