



Cloud based accessibility of Electronic Health Record from android application

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ABSTRACT

The disabled persons need help from others for maintaining their medical details. To decrease their dependency, all health care centres use a common database for storing and sharing the patient medical details among them. So, patients can access the details of medical history like past surgeries, medications, allergies, laboratory test etc., in the database from anywhere and anytime with user's comfortable. In the proposed system, the user (both physician and patient) can be able to view access and update the details by using the android application through their mobile phone in a secured way. Firebase storage provides file uploads and downloads for firebase apps, regardless of network quality. The developer can use it to store images, audio, video, or other user-generated content. Firebase storage is backed up by google cloud storage. The DES algorithm is used to protect the patient medical information by encrypting the data. This enables only authorized persons to access the details, which prevents hacking of patient private health details. In addition, we have also included a feature which will reveal the live location of disabled persons in case of emergency, even if you don't know your location or can't speak. This agenda discusses the importance of secured storage and retrieval of the patient health record information from the firebase storage via an android application.

Keywords: EHR (Electronic Health Record), PHR (Patient Health Record), Mobile application, DES (Data Encryption Standard).

Introduction

The proposed project is an electronic health record application which will store the patient's past medical details. This is a web based android application by which patients can be able to access and view their details by using the android application through their mobile phone in a secured way from anywhere. In the past, the people used manual methods and papers to store the patient's record in any healthcare centre such as a hospital, clinic, dispensary or any other healthcare unit. The health care providers or physicians were also not allowed to access and keep patient medical record history which could be used in the future and would be helpful for the patient's treatment in the future. To overcome these challenges, we have developed a web-based EHR system that can be used by physician or hospital to collect a patient's health information (e.g., past surgeries, medications, allergies, laboratory test, physician's information etc.). This information could be available anywhere to hospital and could be used by the patient's physicians for patient treatment. Once the physician adds the patient's medical information, a unique code will be generated automatically and also the code will be sent to that particular patient's mobile number. Using this code, the patient can view their own health record. To prevent hacking of medical details and to provide security, we have used DES encryption. So, all the patients' medical details that are entered by doctors are stored in the firebase in an encrypted format. When doctor or patient need to access the medical information, then the details will be decrypted automatically and will be displayed to the users.

Moreover, to help for the handicap or disabled people in the case of emergency, clicking on a button will automatically reveal the user's current location as a message to the intended recipient (may be ambulance and some person). This may rescue a person's life.

Learning Model

The healthcare units around the world are encouraged to develop a new computerized system to keep the patient medical record history, which could be used in the future and could be accessed from hospital across the country. The system which was developed is called Electronic Health Record Systems. But from time to time, the demands and requirements of people or medical providers become changes and they tried to introduce a new version of this EHR system in which the patient's records could be accessed remotely. They called it web-based EHR system.

Android provides freely its software development kit (SDK) to the developer community which minimizes the development and licensing costs which is very difficult and expensive by using the traditional technologies. The API Level expressed by an application will be compared to the API Level of a given Android system, which may vary among different Android devices. Despite its name, this element is used to specify the API Level, *not* the version number of the SDK or Android platform. Android Studio is the official Integrated Development Environment (IDE) for Android app development,

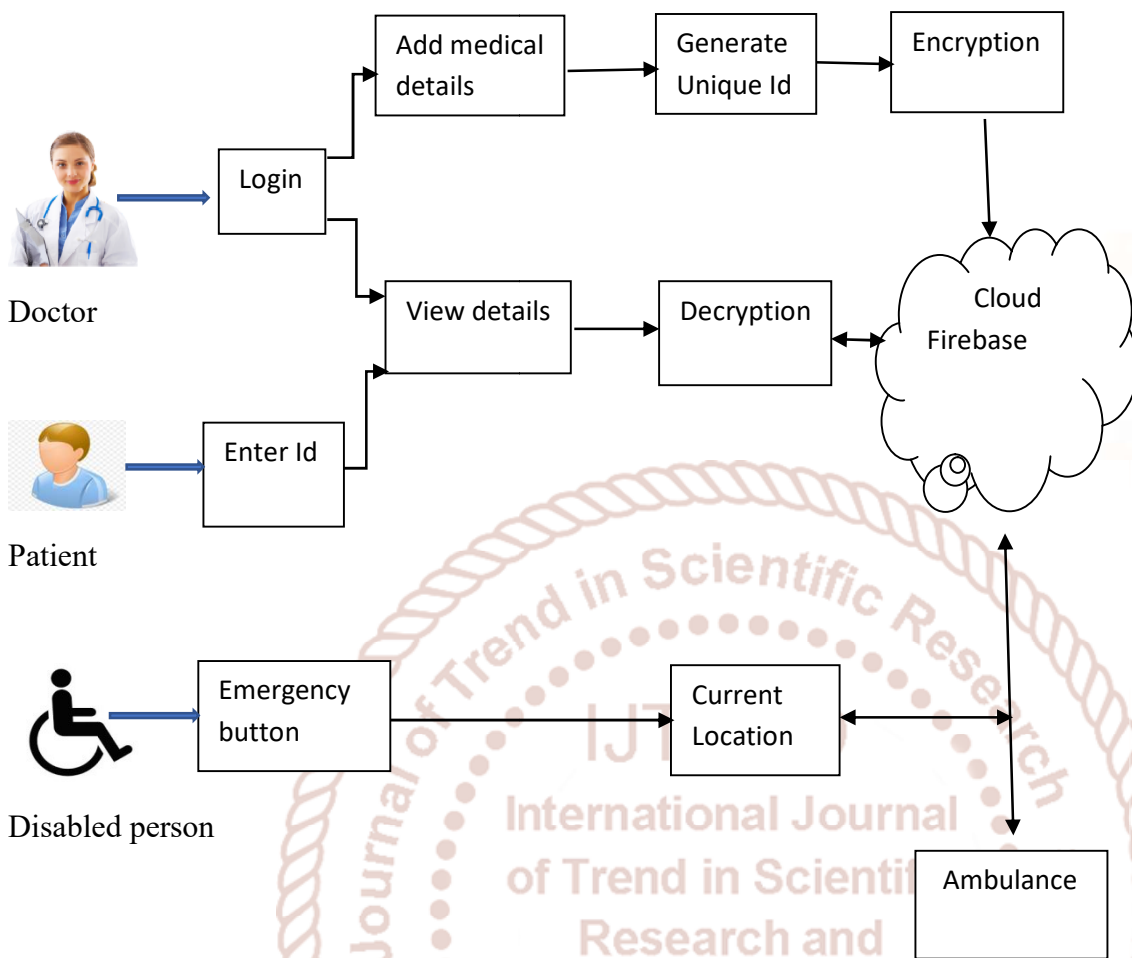
based on IntelliJ IDEA . On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps.

Firebase is a Backend-as-a-Service—BaaS—that started as a YC11 startup and grew up into a next-generation app-development platform on Google Cloud Platform. Firebase frees developers to focus crafting fantastic user experiences. We don't need to manage servers and don't need to write APIs. Firebase Storage provides a simple way to save binary files—most often images, but it could be anything—to Google Cloud Storage directly from the client!!! Firebase Storage has its own system of security rules to protect your GCloud bucket from the masses, while granting detailed write privileges to your authenticated clients.

Proposed System

An Electronic Health Record (EHR) is a digital version of a patient's paper chart. EHR are real-time, patient-centred records that make information available instantly and securely to authorized users. It is designed for any hospital to replace the existing manual paper-based patient's medication and health details adherence. Having an app is becoming increasingly important for any business in today's mobile age. In today's world most of the people are carrying their mobile phones wherever they go.

Architecture



Our proposed system is to build an android application which can be accessed through smart phones as 77% of the world's populations are online and using smart phones and tablets. It is mainly focused for users to view patient's medical history at anywhere and anytime. To prevent hacking of medical details and to provide security, we have used DES encryption. The additional option can be used for disabled person, because they need help from others. In case of any emergency they can press the alarm and it will send message to the mobile numbers that are updated in their application.

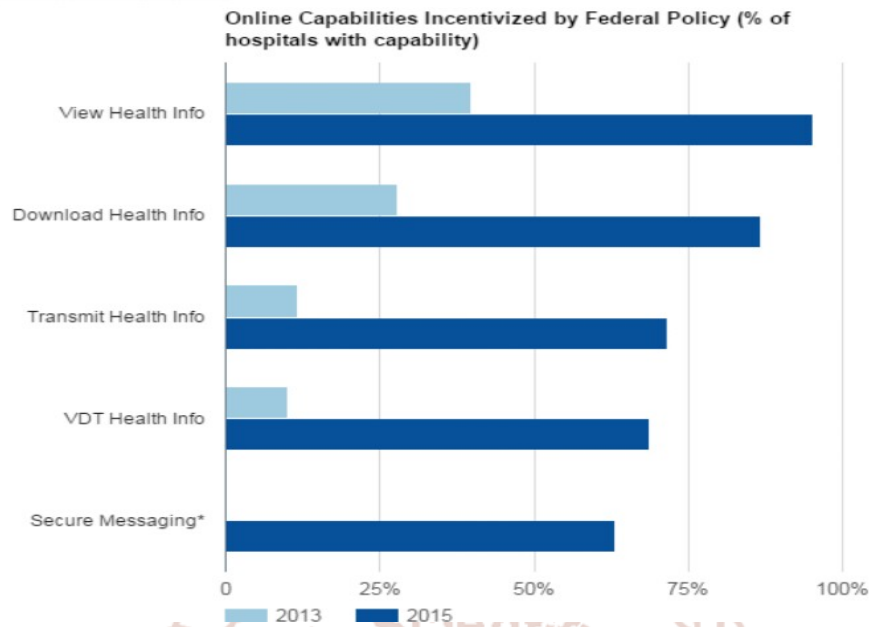
Objectives of EHR:

Online accessing of Patient Health Record save money and time. Because there is no need for patients to go to hospital for collecting their health reports.

Instead they can view their report through mobile application at anywhere and at any time using internet connection. Here, Firebase stores the uploaded medical details.

Influence of android EHR application:

Nowadays mobile phone is very frequently used by all people and almost uneducated people also using smart phones. Still we don't have any application particularly for the disabled people. So, this electronic health record application will be very useful for people as it saves the travelling time, cost and also useful for disabled person. This project is helpful to all people and for the disabled person in case of emergency. We hope our project will reach to most of the people as the user level is increased suddenly by 20-40% in 2015-2016.



CONCLUSIONS

This paper emphasizes the security for patient's EHR by encrypting the data as it avoids hacking of PHR details. The user can view the patient medical history through their mobile phone from anywhere and at any time. Our smart phone will send a message to the ambulance or the contact number that is entered to help them in emergency situation.

REFERENCES

1. Y. Kwak, "International standards for building electronic health record (ehr)," in Proc. Enterprise Netw. Comput. Healthcare Ind., pp. 18–23, Jun. 2005.
2. M. Eichelberg, T. Aden, J. Riesmeier, A. Dogac, and Laleci, "A survey and analysis of electronic healthcare record standards," ACM Comput. Surv., vol. 37, no. 4, pp. 277–315, 2005.
3. T. Benson, Principles of Health Interoperability HL7 and SNOMED. New York, NY, USA: Springer, 2009.
4. J. Lehtinen, J. Leppänen, and H. Kaijanranta, "Interoperability of personal health records," in Proc. IEEE 31st Annu. Int. Conf. Eng. Med. Biol. Soc., pp. 1726–1729, 2009.
5. R. H. Dolin, L. Alschuler, C. Beebe, P. V. Biron, S. L. Boyer, D. Essin, E. Kimber, T. Lincoln, and J. E. Mattison, "The HL7 Clinical Document Architecture," J. Am. Med. Inform. Assoc., vol. 8, pp. 552–569, 2001.
6. R. H. Dolin, L. Alschuler, S. Boyer, C. Beebe, F. M. Behlen, P. V. Biron, and A. Shabo, "The HL7 Clinical Document Architecture," J. Am. Med. Inform. Assoc., vol. 13, no. 1, pp. 30–39, 2006.
7. M. L. Müller, F. Ückert, and T. Bürkle, "Cross-institutional data exchange using the clinical document architecture (CDA)," Int. J. Med. Inform., vol. 74, pp. 245–256, 2005.