

Unique Approach to Manage Patient Medical Records using Firebase

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Abstract—The world is in need for a system where every individual's medical records ought to be handy or accessible. Although our generation is at the forefront of technological advancements more than ever, we still rely on paper based documents for accessing our medical records. While this is time-consuming, it is also an inefficient way of saving our records for use in the near future where we rely more and more on data stored electronically, helping us access it from any part of the world. Our aim is to build an application system which stores all details like allergies, medical history, surgery history, prescription drugs. We basically, keep a track of the person's profile concerning his/her body's biological trend. The app will be able to authenticate the user by using biometric sensors (if available on the phone) along with the national id number (Aadhar card number). Consider a scenario where a patient is admitted to a nearby hospital, with the help of proposed system all his/her records could be seen without requiring them to speak for themselves. This could be of great help in case of blood transfusions or any other protocols followed in an emergency.

Keywords—app, sdk

I. INTRODUCTION

Even in the 21st century, we still rely on paper based documents and loads of files for accessing our medical records. While this is time-consuming, it is also an inefficient way of saving our records for use in the near future where we rely more and more on data stored electronically, helping us access it from any part of the world. The role our system plays to mitigate this problem is to create a system where a person's medical records would be available via the cloud. Our aim is to build an application system which stores all details like allergies, medical history, surgery history, prescription drugs. The app will be able to authenticate the user by using the national id number (Aadhar card number, in our case). Such details will be used to verify that the intended person is using the app instead of a person with malicious desires. The user could show his/her profile while paying a visit to a doctor. The doctor could fetch the patient's records and take a quick glance at the profile without asking the patient to get loads of files along. The user could also upload scanned copies of various medical reports onto the app. Also, a list of prescription drugs taken by the patient is maintained so that the doctor can avoid drug reactions beforehand i.e. before prescribing new drugs. The possibilities are endless. When a patient is admitted

to a nearby hospital, all his/her records could be seen without requiring them to speak for themselves.

The main goal of our project is to store patient medical records on a cloud server which has a database for storing all of user's data. The goal is to make it accessible at any place, at any given time. The standard commonplace protocol of carrying paper based documents these days which keep a track of our medical history is out dated and needs to be revamped immediately. In an era where google is developing robotic arms to aid disabled people, we still fail to make a good use of technology in the right place. By applying data analytics to the healthcare information, providers can leverage the content collected from across multiple facilities, patients and physicians, to derive actionable clinical intelligence. Within this information cloud is the potential for the development of clinical best practices, like better understanding clinical decisions for a particular population or identifying health trends in the early stages. With the right applications, providers are better able to manage chronic diseases like diabetes, cancer and heart disease. They lower the cost of healthcare for all and improve the quality of life for many. Thus, by implementing the system we will design, medical records could be arranged in a more organized manner.

II. ANALYSIS

The healthcare industry has traditionally underutilized technology as a means of improving the delivery of patient care. Even today, organizations still rely on paper medical records and handwritten notes to inform and make decisions. Digital information is stuck between departments and applications, making access to a patient's longitudinal record difficult, if not impossible. This lack of access costs the healthcare industry millions of dollars each year in duplication and waste. Patients today are better advocates for their own healthcare; they are more educated about their diseases and increasingly demand access to the latest technologies. As a result, demands for access to personal patient records are increasing and organizations need to keep up. When citizens can access bank accounts from anywhere in the world, withdraw money, get balances and make payments, it is hard for them to understand why they cannot have universal access to their secure health.

III. PROPOSED SYSTEM

The existing system is static and cannot reach out to the masses. Although now there are few applications out there which are dynamic in nature, none of them can reach a level where it can be stable and useful. Our software application makes it really easy and intuitive for the user/patient to log onto the system and access his/her data. The overall interface of the application is totally intuitive and does not need any explanation. The application will be available for download on the Google Play Store. The application will be an effective tool to document your medical history chronologically if needed. The data will be authenticated by the doctor and the patient's registration id.

IV. METHODOLOGY

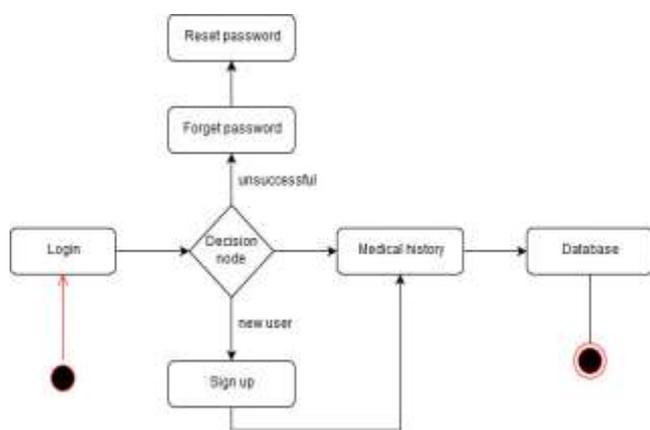


Figure 1. Activity Diagram

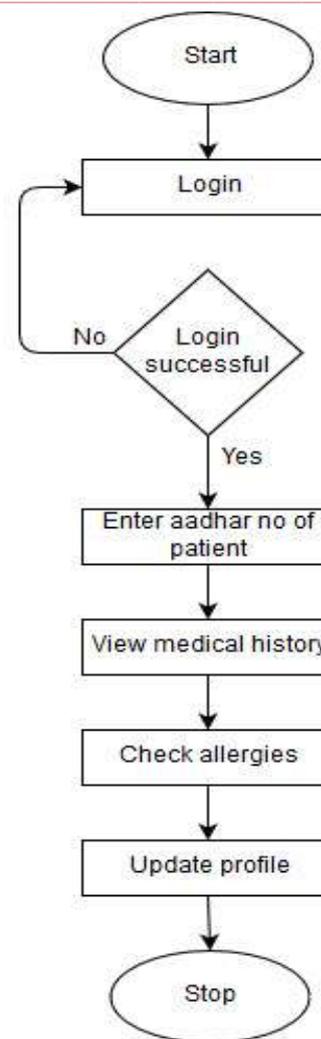


Figure 2. Flow chart

Phase 1 includes coding the two applications required for the project. The Customer/Patient application has functionalities which include updating profiles/records, uploading prescriptions, reports. Setting reminders for taking medicines. The Doctor's application functionalities include requesting access to the particular customer's medical history via his/her national id. Writing notes on uploaded reports or adding information to the accessed account.

Phase 2 includes connecting both the applications to firebase real time database. Both the applications are connected to the same database.

Connecting the applications to firebase is simple. Firebase has different dependencies for different features. The features include real time database, file storage, analytics, cloud messaging, authentication etc. These dependencies can be included in gradle file for that particular application. Once the dependencies are added sync the project in android studio.

Firestore account can be accessed with gmail account. Once logged in firebase provides a console to interact and enable or disable the features provided.

This console can be used to set database rules, send cloud messages, keep track on number of users, control on authentication methods, view analytics etc.

Phase 3 involves deploying the application on google play store for users to download and use the application.

V. TEST RESULTS

We performed validation checks on both the applications. The user was prompted to enter valid entries in all the fields. Once registered the app then sent a verification email to the registered email address. This eliminated the fake users from populating the database. The app is compatible with lower android versions with minimum Sdk version 19. Right permissions were set as to who can update the data in database for a particular account. Doctor's application successfully retrieved the patient's medical history after entering the national id of that particular patient.

CONCLUSION

Firestore provides access to applications that were previously unattainable by providing a backend service for mobile/web apps. For example, the implementation of digital pathology, managed through firestore database, has a huge clinical impact on an organization. The organization can roll out a service that would have cost millions just for the storage alone, but now can pay for it as they use it. These same experts can access patient data remotely and on demand through the Internet via a variety of connected devices. Physicians can review the latest diagnostic results from home.

By applying data analytics to the healthcare information, providers can leverage the content collected from across multiple facilities, patients and physicians, to derive actionable clinical intelligence.

Within this information cloud is the potential for the development of clinical best practices, like better understanding clinical decisions for a particular population or identifying health trends in the early stages.

With the right applications, providers are better able to manage chronic diseases like diabetes, cancer and heart disease.

Thus, they lower the cost of healthcare for all and improve the quality of life for many.

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