

AN ANDROID APPLICATION FOR BLOOD AND ORGAN DONATION MANAGEMENT

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ABSTRACT:The application nicknamed as 'life siren' aims at bridging the coordination and communication gap between patients and donors, we know that lot of patients die without access to a proper donor, be it organ or blood. A mobile application that would bridge the gap is the need of the hour, life siren is no different and it is a bit different from the existing system, our application makes use of a mobile app at both the ends, anyone can register and turn out to be a user, the hospital when in need raises a request for blood/organ of a specific type with all the details, and this request will notify all the users and the nearest medical bank centres of it, the request will have an authorized e-signature of the handling doctor with their contact details, and the application will let the recipient choose the most feasible and nearby donor for help. The app is set to start out on Android and will make use of an SQLite database at the application's end.

KEYWORDS:

ANDROID, CLOUD SQL, SQLITE, BLOOD DONATION, ORGAN DONATION, HEALTH CARE.

I.INTRODUCTION:

It is said that on an average day, more than 10 people are in deficit of a proper organ donor, and that closely about 121,000 for an year await a donor in the US, in India the statistics are even worse as more than 8000 people suffer every year without the proper acquisition of a donor, why do these fallacies occur? , these mistakes occur as a lack of proper connection between a willing donor and a needful patient, however this also hasn't stopped the illegal processes of organ transplants , where certain organizations kidnap people and perform organ trafficking, there has always been a need to put a check of control on all these issues, The Transplantation of human organ act (THO) was passed in India in 1994 to monitor and coordinate organ donation and transplantation activities, there are certain higher authority bodies that were commissioned under it, Appropriate Authority (AA): inspects and grants registration to hospitals for transplantation, Advisory Committee (AC) : consisting of experts in the domain who shall advise the

appropriate authority , Medical board (Brain Death Committee): Panel of doctors responsible for brain death certification. The main idea of this proposition is to have a mobile application that gives people the choice to be a donor when a hospital near them is in need of blood or an organ, the application named as 'life siren' will be able to fetch the authorizations from the above mentioned bodies, and connect the donors with the most needful patient of the hour, it can connect them with any nearby blood bank too on request. The application is set out to start as an Android based one , but eventually aimed at reaching out to devices of all kinds, the application allows any normal civilian user to register, but only the authorized admin from the other end can validate the credentials and user information before they can tend to the need of a patient, in case of a blood donation , the hospital sends request for the particular blood type and waits for a potential donor to respond. The application will be developed on the Android studio SDK and will use an SQLite database at the installer's end, SQLite will serve as a better option for the database purpose as the application needs to be installed at the user's end and that the database application doesn't need any separate installation.

II.LITERATURE SURVEY

Promoting and assisting eye donation using mobile applications - Among a huge crowd of blind people, several people suffer from corneal blindness. Corneal donations are done in a large scale nowadays in order to restore the vision of the blind people. A survey has been taken among a group of participants in order to determine the awareness about the corneal donation, the factors which prevent the eye donations and the possible solutions for creating an awareness among the people. The study highlights various social beliefs, myths and illiteracy which are the major causes inhibiting the eye donations in both rural and urban areas. The analysis of the survey suggests a mobile application as a resolution for this cause. A test was done in order to check the efficiency of the method. It brought an overwhelming change of about 73.41% in their marks.

Prototype development for an android-based medical record system

- Nowadays, the healthcare system and medical industry can be greatly improved with the application of emerging trends in the information technology. A conventional method for maintaining records and other operational activities in the hospitals is the paper based medical record. It has some drawbacks. Developing a mobile device application for maintaining all the medical records provide various advantages like unlimited space and time. It can also improve the capabilities of the system drastically in an unimaginable manner. A research has been conducted to check the feasibility of using mobile applications for maintaining medical records by using a MySQL database at the backend. It brought an improvement of 74.17% in their marks.

Architecture for centralizing healthcare services

- Despite the advancements in technology, health care systems are still facing lots of struggles and issues. One of the most critical problems is the entire lack of communication between the systems or the slower communication speed among them. If the required medical information is not shared between the systems, then it may imperil the relationships among them and their reputations. In a worse- case scenario, it can also take down the healthcare system into a completely useless state. A general solution of Representational State Transfer (REST) architecture and Health Level-7 (HL7) standards has been proposed in order to enhance the communication among the medical systems.

Blood bank information system - In emergency situations, the availability of blood compatible with our blood group is highly critical for every human being. A huge number of blood banks are available nowadays. And also, there are a number of electronic blood donation centres which are formed for establishing a communication between the available donors and medical facilities, and the beneficiary. But none of them offers the immediate contact. It is the major downside of the real framework. And also, they are more tedious and expensive. All these drawbacks can be overcome by the use of an android application. This framework can enhance the blood bank information system and we can also keep track of various records including the active donors, kind of blood groups being donated and received by the individuals.

Blood donation using android application

- Major advances can be brought with the application of mobile devices and communication technologies in the field of healthcare. In healthcare services, blood donation is a complex process which involves finding a donor whose blood group is compatible with the blood group of the patient. Establishing a communication between the donor and the requestor is an even complex task. With the overwhelming number of mobile users, it is possible to establish such a connection very easily. The requestor can broadcast the

required blood details and the donors can respond to them. This approach will make a stepping stone for reducing this vast global space into a smaller local one.

III.EXISTING SYSTEM

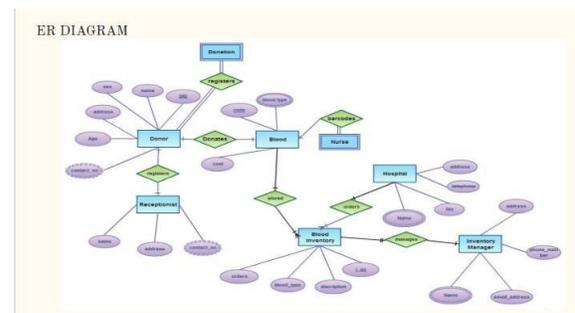
The blood bank system applications that are currently in existence require the user's involvement in most of the processes, A person needs to be connected to the web to if he wishes to know about the donor, the data about these people is provided by themselves from the other end , and access to information about their medical history is more than an add-on or a feature, access to proper information is not adequate and available in most scenarios.

IV.PROPOSED SYSTEM

The proposed system is a mobile application that is set to be initially developed on an Android centric environment using Android studio SDK and the database is to be developed using SQLite. The system's functionality would mainly include the following actors.

1. Hospital
2. Normal users
3. Donors
4. Blood banks and organ bank.

Entity – Relationship diagram:

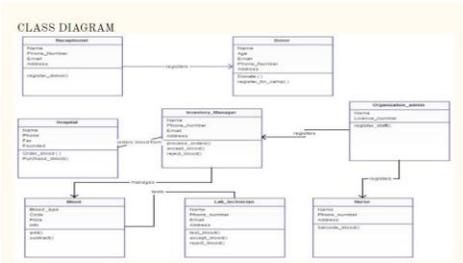


System design:

The application starts with an authentication check which is done with Firebase Authentication Mechanism. The authentication mechanism is classified into two categories, the first being the organisation authentication and the other is user authentication. On Authenticating successfully, they are allowed to access the application. The application maintains a database of all the hospitals and organ banks which are the major ones in each city ,we give a verified status to those hospitals and these hospitals can verify other small hospitals to join the service .When there is a need for any organ or blood the user can make a request through the application with a practicing doctor's Id (we collect doctors' id for authentication purpose). The request is first updated

in Cloud SQL and is broadcasted to all hospitals and organ banks who can respond to request through the Application and when more than one is ready to donate, we match the best ones. This application has a separately viewable screen where all the requests to you are specified and your response will be updated in the cloud database. We can later view the responses to our request once a response is received on the cloud database.

Class diagram:



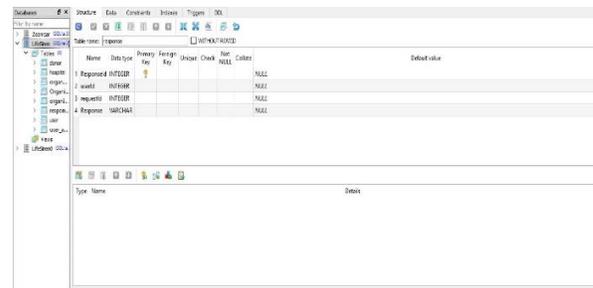
System Database:

It stores the details of Hospitals, Normal users, Donors, Blood banks and organ banks. The database is privately hosted in a cloud environment. The cloud SQL is a cloud service provided by Google Cloud Platform. It provides a highly secured channel for data exchange. The SQLite database is used to maintain a local database. The local database is made to be in sync with the cloud database. The main reason for choosing SQLite over MySQL was due to its high portability and ease of access with third party tools. It builds a layer over the basic database. We can also use wrappers to access our database. The database also stores information about - Eye Banks, Skin Banks, Organ Transplant Hospitals, Body Donation NGOs in the field of Organ Donation, Law on Transplantation.

Cloud SQL and SQLite has been chosen as the ideal database application for this app because of the following advantages. Cloud SQL is a kind of application that makes working with relational type of databases quite easy and convenient. It can be used with SQL SERVER, SQLite, MySQL and PostgreSQL as well. The performance, efficiency and security patches are all taken care of here by the Google cloud crew. We can connect to the Google cloud services with tools like Python's app engine, app script, workbench and other similar third-party apps can be integrated to it too, other than this it provides a wide range of computing services on the cloud too. Cloud SQL can also be used to manage objects in google cloud platform's console window. The user's data can never be lost, as it is frequently secured and encrypted in the Google's data centres and backup facilities. Data redundancy is preserved. It provides support to a wide range of SQL based systems. It clones the instances that try to access its services. The

services are distributed too widely. The databases can be imported and exported on request. The code-labs under google lets a developer create a new database with the cloud SQL feature that can be managed easily. It is an open sourced database. It provides quite a large storage resource with high end running memory. Even though it is a pay per use option, it isn't really expensive. Locking of data is prevented at all costs to allow the users a seamless connection to their data. Some of the restrictions it has are that it doesn't allow user defined functions, and it doesn't support SHA-2 function of MySQL. To manage the instances that the user has created, the user has to make use of the REST API which is offered by the cloud deployment team itself. The API has to be activated and authorized to before being put to use.

Structure of the Database:



The structure of the database can be viewed through the Database Studio.

Working:

A hospital uses the application to raise a request for an organ/blood donor, then the request is broadcasted in the app to all the nearby users and blood/organ bank facilities. The request also contains the details of the patient along with the location of the hospital. It also contains the authorizing signature of the doctor observing and handling the patient's case along with the contact details. The details will be revealed once the request's organ/blood details match the donor's organ or blood details. It will show the distance of the donor or the bank facility from the hospital. It will show a list of probable candidates and allow the hospital to choose from it. In case of an organ transplant the application raises and lodges a request to the appropriate authority (AA) under the THO (Transplantation of human organs act) and gets the authorization to proceed forward with the transplantation. The database developed using SQLite stores the user details who could turn out to be potential donors, details such as their medical history records, blood type, physical stats and location distances from a particular hospital upon matching, another table is entitled to store the details of hospitals.

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