University of Pittsburgh

Department of Computer Science

CS2310 Multimedia Software Engineering

Final Project Report

Patient Tracker - Android Application

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**Abstract:**

This report describes the implementation of an **android application** to assist Doctor’s for patient data management and viewing. The doctor can easily add new patient’s info as well as track the patient medical history at any given point of time all in his android mobile phone.

**Introduction:**

I have implemented an android application for patient data management and viewing. The system is aimed to help doctors to add new patient personal information and update the medical condition each time he visits. The doctor can use the application to get all the past medical history of that particular patient at any given point of time. The doctor can also check on all the patients he treated for any particular day of the calendar.

System is a standalone system that can be installed on an android phone and can be used with valid login credentials. On installation and successful login into the application, a doctor can add a new patient, his personal information, medical information and also he can insert new medical conditions into the existing patient’s medical records. The application allows doctor to insert various data fields regarding a patient including patient name, contact information, age, blood group, gender, medical condition, medication provided, date of visit which the system automatically takes in, etc. The system saves all the patient information in a database created in the android phone. The doctor may now view this data as and when needed. The application allows doctor to search patients by name which **displays all his medical conditions and the medication received in a chronological order starting from most recent visit**. The application also has feature where the doctor can pull out **all the patients he attended for any particular date**.

**Software and Tools:**

1. **Android SDK:** To create the android application.
2. **Eclipse:** Development environment.
3. **Android Phones:** HTC One, Nexus 5x, Moto G devices used to test the application.
4. **SQLite:** Database used in the android phone.

**Database Definition:**

Based on the functionalities of the **Patient Tracker** application, I have created 3 database tables:

1. **Table Doctor:** This table is created to hold the doctor login id and the password, where login is the primary key of the table.

<table>
<thead>
<tr>
<th>login</th>
<th>password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varchar</td>
<td>varchar</td>
</tr>
</tbody>
</table>
2. Table Patient: This table holds all the personal information of the patient namely,
   a. First Name
   b. Last Name
   c. Email
   d. Mobile
   e. Address
   f. Age
   g. Blood group
   h. Gender

<table>
<thead>
<tr>
<th>Fname</th>
<th>Lname</th>
<th>Email</th>
<th>Mobile</th>
<th>Address</th>
<th>Age</th>
<th>Bloodgroup</th>
<th>gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varchar</td>
<td>Varchar</td>
<td>Varchar</td>
<td>Varchar</td>
<td>Varchar</td>
<td>Number</td>
<td>Varchar</td>
<td>Varchar</td>
</tr>
</tbody>
</table>

3. Table Medical History: This table as the name suggests contains medical records of each patient. The table contains the below information:
   a. Email
   b. Date of visit
   c. Medical condition
   d. Medication
   e. Note

<table>
<thead>
<tr>
<th>Email</th>
<th>Date of visit</th>
<th>Condition</th>
<th>Medication</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>varchar</td>
<td>Date</td>
<td>Varchar</td>
<td>Varchar</td>
<td>varchar</td>
</tr>
</tbody>
</table>

Since patient can have same name I decided to go with the email as primary key for table Patient and to link each patient with their medical history I have used the combination of email and date of arrival as primary key where email is the foreign key referencing the table patient.

System Description:

The application is designed for the doctors and hence not everybody can register into the application. Hence to overcome this for any user to register they need to get a Registration code which is provided by the hospital to which the doctor works or ones the doctor has verified his credentials the app market provides the registration code.

After getting the registration code the doctor can set up his profile and login to the application. As and when he treats a patient he can key in the patient details into the application and also his condition, medication provided as well as note/suggestion to the patient.

Once the patient details are keyed into the application the doctor can use it every time the patient visits him and insert the medical condition or look into his medical history for reference and based upon that he can provide medication.

The doctor can also keep tab on the patients he treated on any particular date for his own reference.
Interface Look and Feel:

1. Login: Doctor has to login with a valid username and password, if s/he does not have a profile registered s/he has to go to the register page. Below are the screenshots of the login page, if we key in invalid username and invalid password. On successful login we can see doctor menu(Fig 7).

![Fig 1. Login Page](image1)
![Fig 2. Invalid username](image2)
![Fig 3. Invalid Password](image3)

2. Register: Doctor can only register with a valid registration code otherwise registration fails. Below are screenshots for register page, registration failure and on successful registration.

![Fig 4. Register page](image4)
![Fig 5. Wrong Registration code](image5)
![Fig 6. Successful Registration](image6)
3. **Doctor Menu:** Doctor Menu provides functions to add a new patient, search for a patient and search patients using date of visit.

![Doctor Menu](image)

**Fig 7. Doctor Menu**

4. **Add Patient:** This page gathers all the patient personal information and in the next page gathers the medical condition for that particular day.

![Add Patient Details](image)

**Fig 8. Add patient**

![Add Patient Details](image)

**Fig 9. Patient Personal info**

![Saved Patient Info](image)

**Fig10. Saved Patient Info**
5. Search by name: This page pulls out medical history of the patient using patients name and also provides an option to insert new medical entry for that particular day.
6. **Entry:** This page takes in the medical information of the patient and inserts into patients medical history.

7. **Search by date:** This function pulls out all the patients who visited the doctor for searched date and also displays the medical condition and their contact information.

![Fig 16. Medical Entry](image1)
![Fig 17. Medical input](image2)
![Fig 18. Medical Record inserted](image3)

![Fig 19. Search By Date](image4)
![Fig 20. Calendar to select from](image5)
Demo Video:

Similar to the demo presented in the classroom, a video demo has been uploaded in the YouTube, the link provide below (P.S first 15 seconds of the demo video has grey screen where I give the introduction and then the actual demo starts):

https://youtu.be/Uxt-mRgHJR0

Limitation of the Application:

1. The Doctor has to have an android mobile phone to use this application
2. The patient data is available only in this application and not populated in other applications.

Future Work:

1. On similar lines an application for patient also can be implemented where he can maintain his medical report, search for the doctors in his area and the availability of the doctor, setting up the appointment.
2. The medical records can be pushed to the hospital database.
3. Basic sensor readings can be collected from the mobile phone itself like the heart rate, and whenever there is some abnormal readings the application warns the patient and after some threshold informs the hospital.