

**A PROJECT REPORT
on
“SMART PILL-BOX”**

**Submitted to
KIIT Deemed to be University**

In Partial Fulfilment of the Requirement for the Award of

**BACHELOR’S DEGREE IN
COMPUTER ENGINEERING**

BY

Sourabh Sarkar	1515048
Srijita Gayen	1515049
Prerna Singh	1515031

**UNDER THE GUIDANCE OF
PROF. Saurabh Bilgaiyan**



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KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
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CERTIFICATE

This is certify that the project entitled

“SMART PILL-BOX“

submitted by

Sourabh Sarkar 1515048

Srijita Gayen 1515049

Prerna Singh 1515031

is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Computer Science & Engineering OR Information Technology) at KIIT Deemed to be university, Bhubaneswar. This work is done during year 2018-2019, under our guidance.

Date: 01/04/2019

(Prof. Saurabh Bilgaiyan)
Project Guide

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Sourabh Sarkar
Srijita Gayen
Prerna Singh

ABSTRACT

The best way to keep one's health issues on check is to keep an eye on the medicines and it's dosage. This is sometime very problematic for elderly or working patients to remember in keeping each and every track of their medicines. Our Smart Pill box keeps a track of the dosage and consumption. Misdosage amongst the elderly can cause serious troubles. The right medicine and the dosage has to be taken care of. Our smart pill box does exactly the same. It will always remind the patient to take the pills in correct dosage on right time.

Keywords: Android, Medicine, Pill Box, JavaScript, embedded C, IoT, Fire-base

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Chapter 1

Introduction

1.1 Purpose

This pill box encourages the client to stay healthy by reminding the patient's pill dose. Its motivation is to educate the client about: -

- Whether the patient has taken out the pill from the pill box at the correct time or not.
- Informs when the pill box gets vacant.
- Checks the blood pressure and creates a graph in the android application.
- Shows all the hospital, medical stores and blood donation centres.
- A person can set timer alerts by pre-setting.

1.2 Project Scope

This venture has a decent degree in the field of medicinal science. It can likewise be utilized by working families to deal with their ill relatives.

1.3 Definition, Acronyms and Abbreviations

- IR- Infra-Red.
- IR Sensor- A highly reliable means of detecting obstacles using reflected infrared light.
- Pulse sensor- measures the pulse and creates a graph on the android application.

1.4 Technology Used

- Android
- Internet of Things
- Firebase Database
- Firebase Cloud Messaging

Chapter 2

Overall Description

2.1 Product Perspective:

The product is supposed to be an all-rounder medicine pill box.

- Medicine Timings: It tells the patient when to take the medicine at the specific time and what medicine to take.
- No medicine alert.
- Blood pressure: Measures the blood pressure of the patient.
- Information: Provides information of hospitals, medical stores and blood donation centres.

2.2 User Class and Characteristics:

- Working class people who cannot medicate the sick people at home.
- For the patients who often forget to take pills.

2.3 Operating Environment:

- Android
- Firebase

2.4 User Documentation:

- SRS
- Project Report

2.5 Software Interfaces:

- **Client on Internet**

1. Android OS (more than API 21)
2. Smart Home Application User.

- **Database Server**

1. Firebase

- **Development End**

1. Arduino IDE
2. Java

2.6 Hardware Interface:

- **Client Side:**

1. Smart Phone with Android
2. Sensors and processor (Nodemcu, Pulse Sensors, IR Sensors)

- **Client Side:**

1. Firebase

2.7 External Forces:

2.7.1 Constraints:

- GUI is only in English.
- The app is limited to one user at a time.

2.7.2 Dependencies:

- Pulse sensor should be accurate
- IR sensor should be accurate.
- Servers should be online all the time.

Chapter 3

Software Requirements Specification

3.1 Functional Requirement

3.1.1 Pill Intake:

1. Android Application: It takes the schedule from the user and gives alert to the user about which pill is to be taken and on the user defined time and checks whether the pill is taken on time.
2. IR Sensor: It will checks the status of the pill. Checks if the pill slot is empty or not.

3.1.2 Blood pressure:

1. Android Application: Blood pressure graph is created to showcase the overall record of the patient
2. Pulse Sensor: It takes in reading and sends it to the database.
3. Pulse History in Database: It saves the pulse reading to show the rate in graph.
4. Firebase Functions: It is written in the JavaScript. When there is an abnormal reading in the database, the firebase function would create a notification and send it to our device using Firebase Messaging Service.

3.1.3 Nearby:

1. Android Application: This UI will show nearby hospitals, pharmacy and blood banks.

3.2.2 RELIABILITY Easy to use. It is reliable and cost effective. But the only weakness is slow networks.

3.2 Non-Functional Requirement

3.2.1 Usability

1. Patient condition can be monitored
2. They can be administered medication remotely.

3.2.2 Reliability

Easy to use. It is reliable and cost effective.

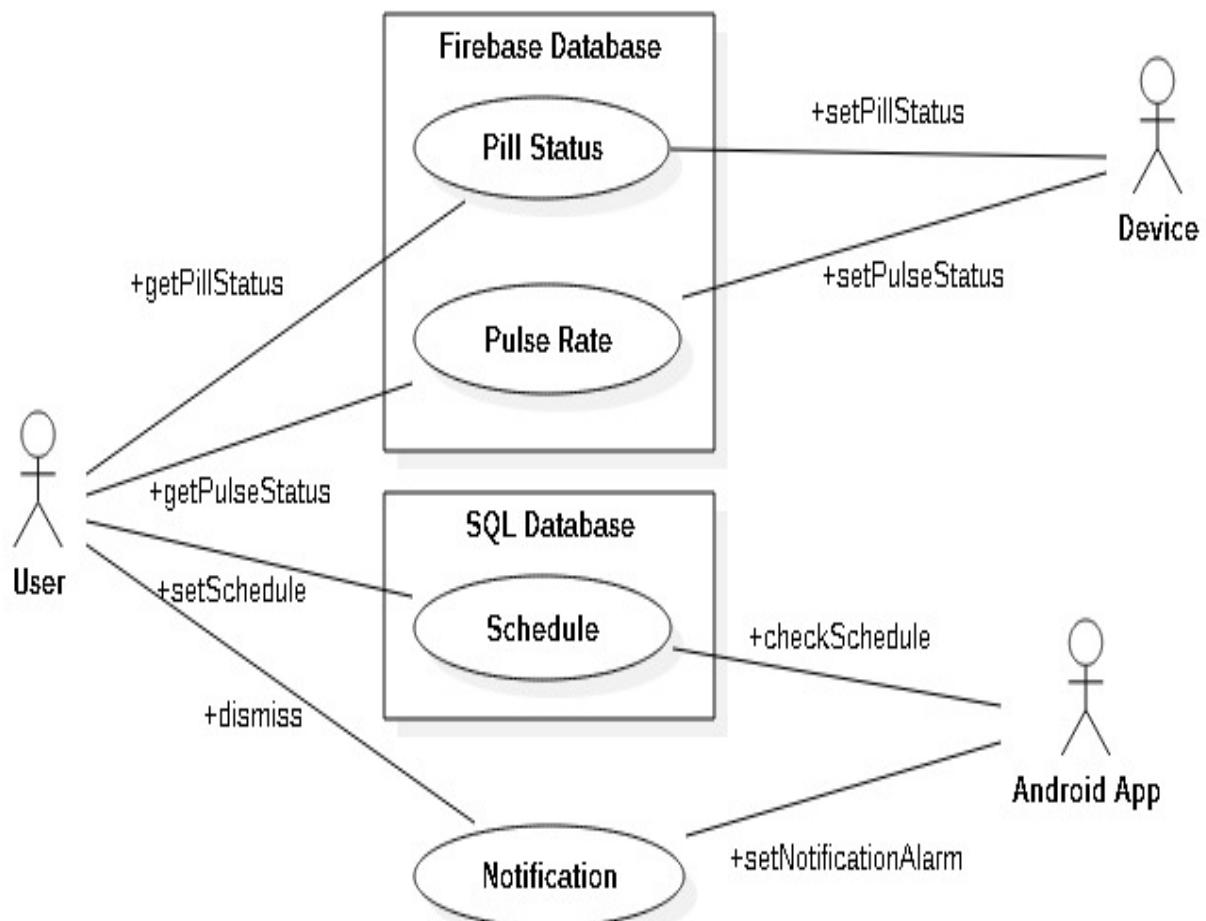
3.2.3 Performance

1. Throughput is fast and reliable.
2. May crash in case of high traffic or slow network speed.

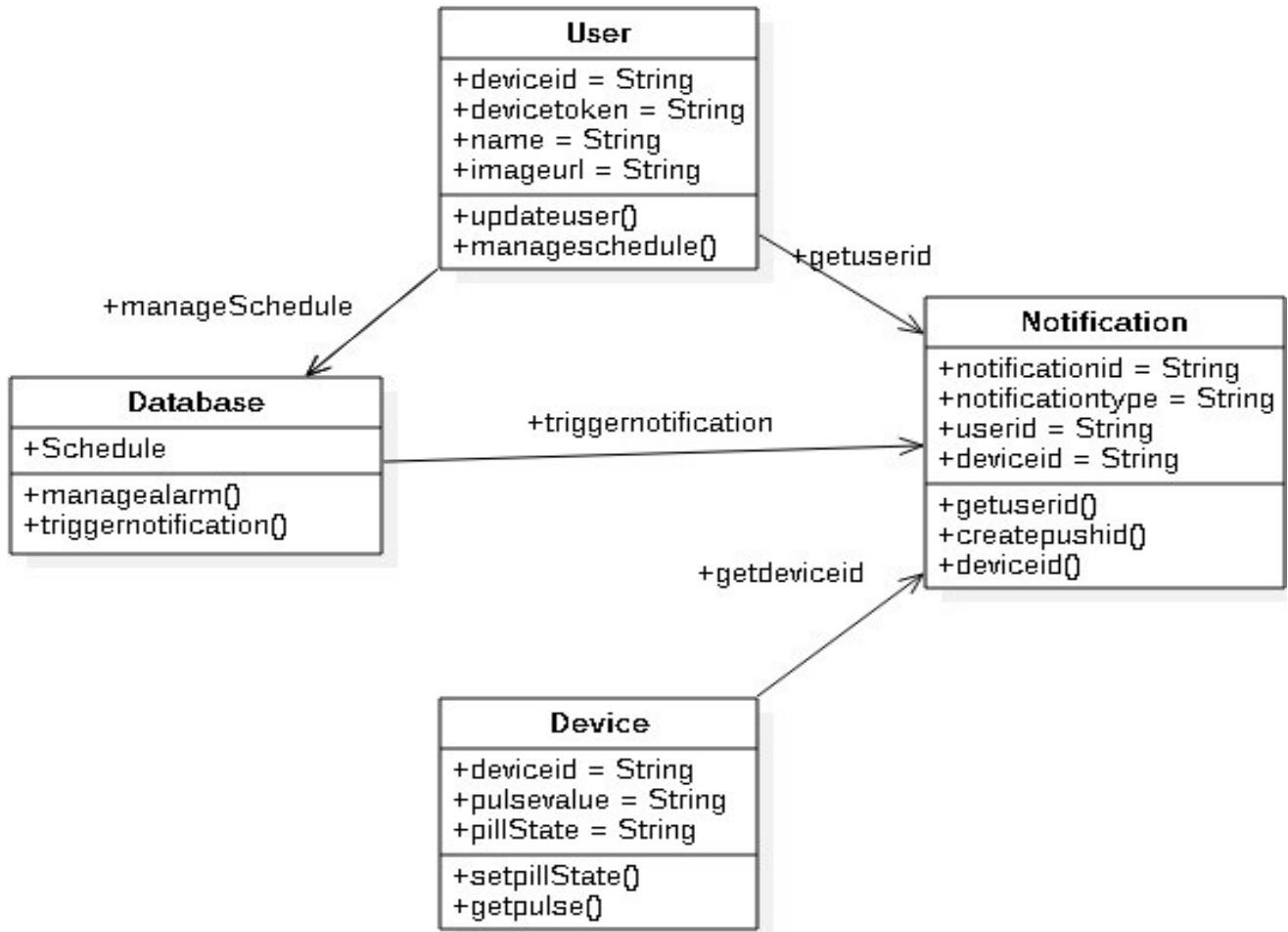
Chapter 4

System Design

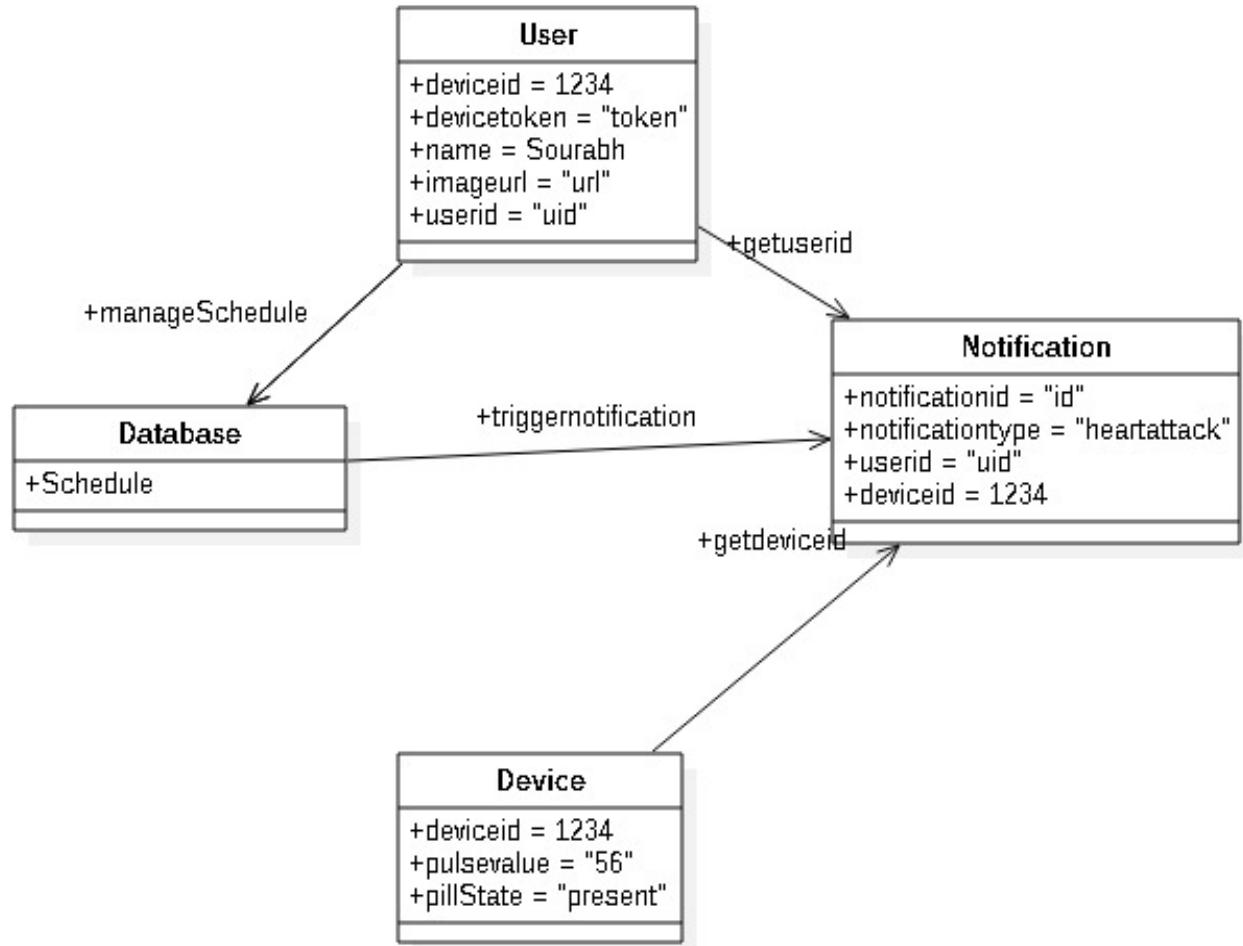
4.1 Use Case Diagram



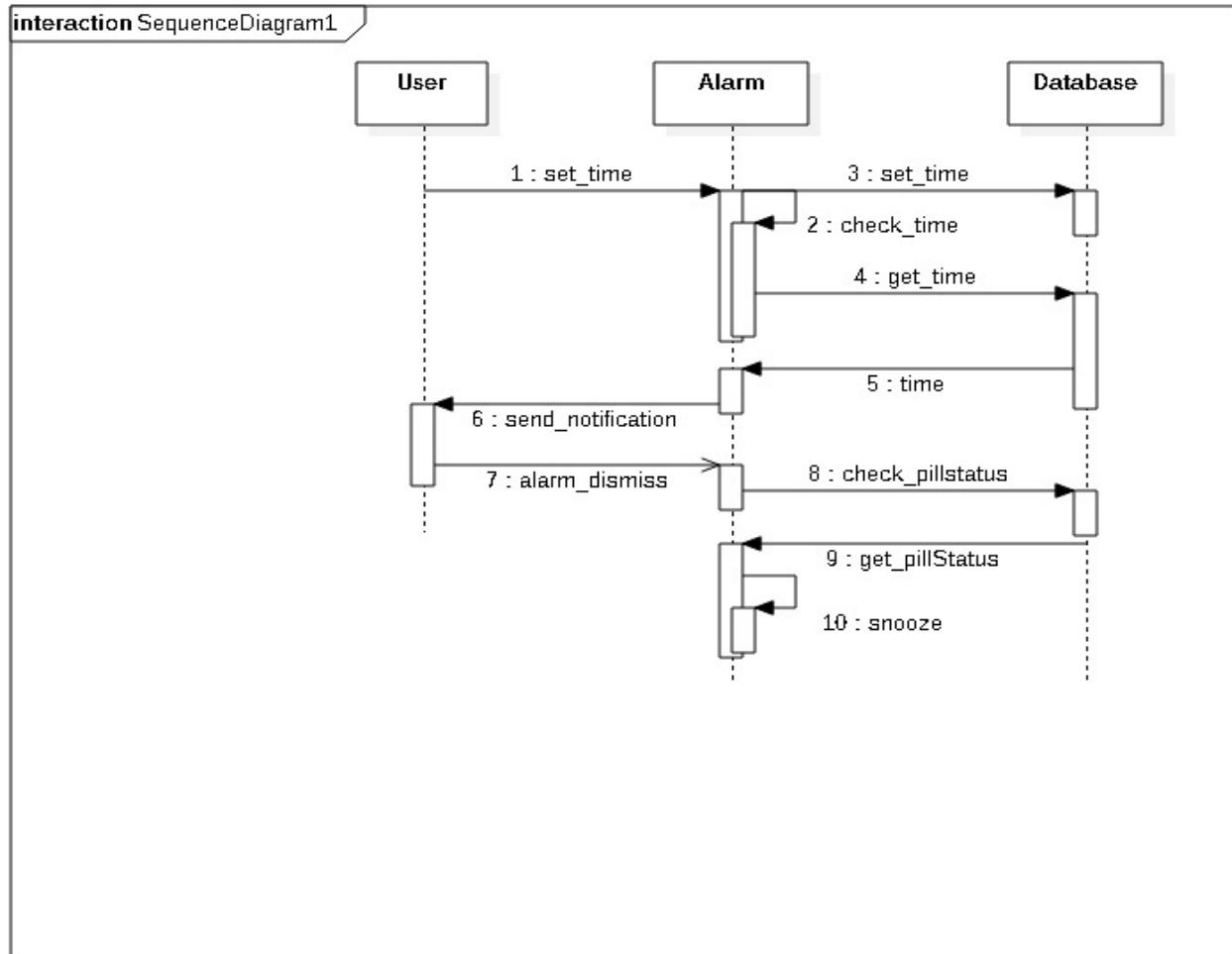
4.2 Class Diagram



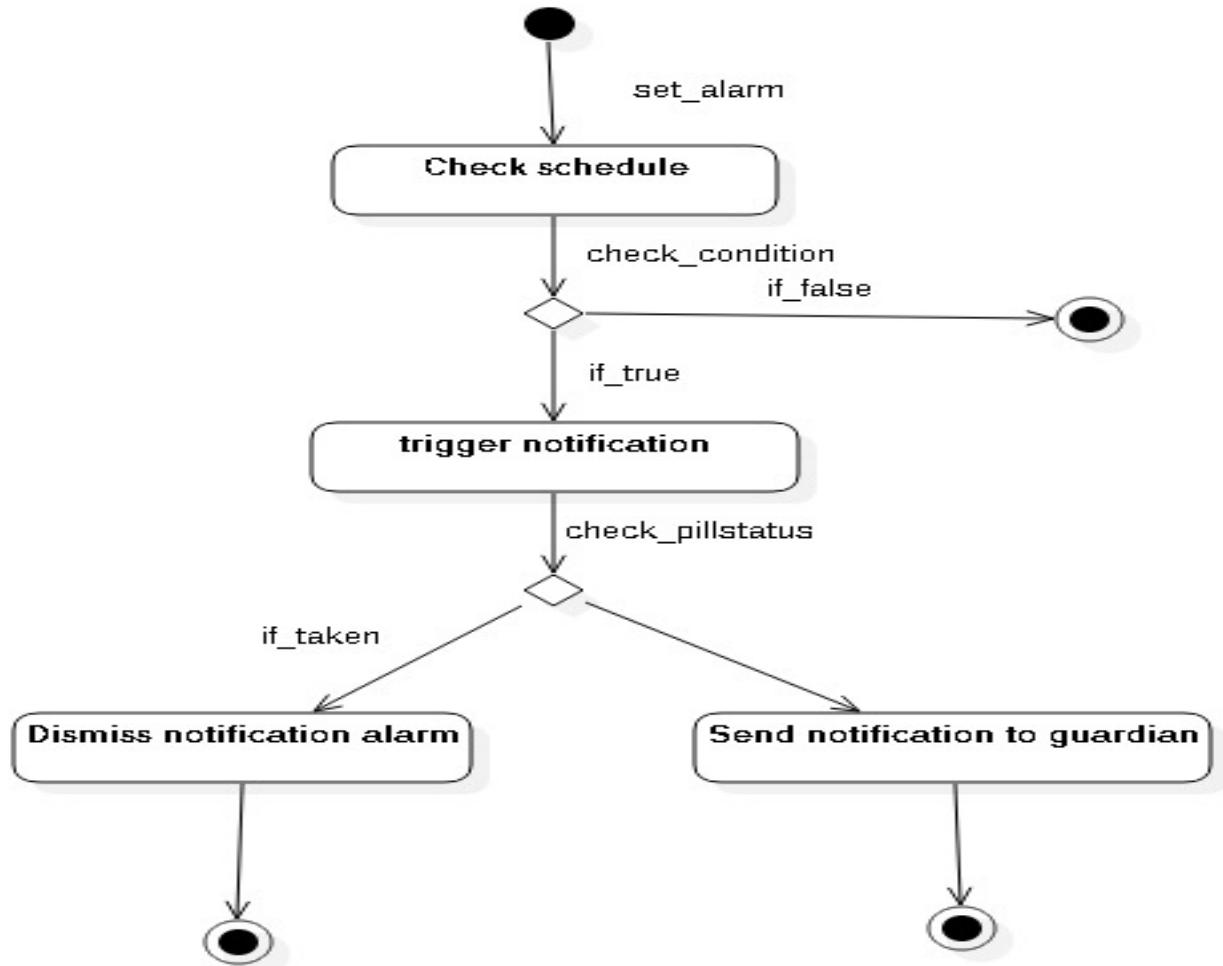
4.3 Object Diagram



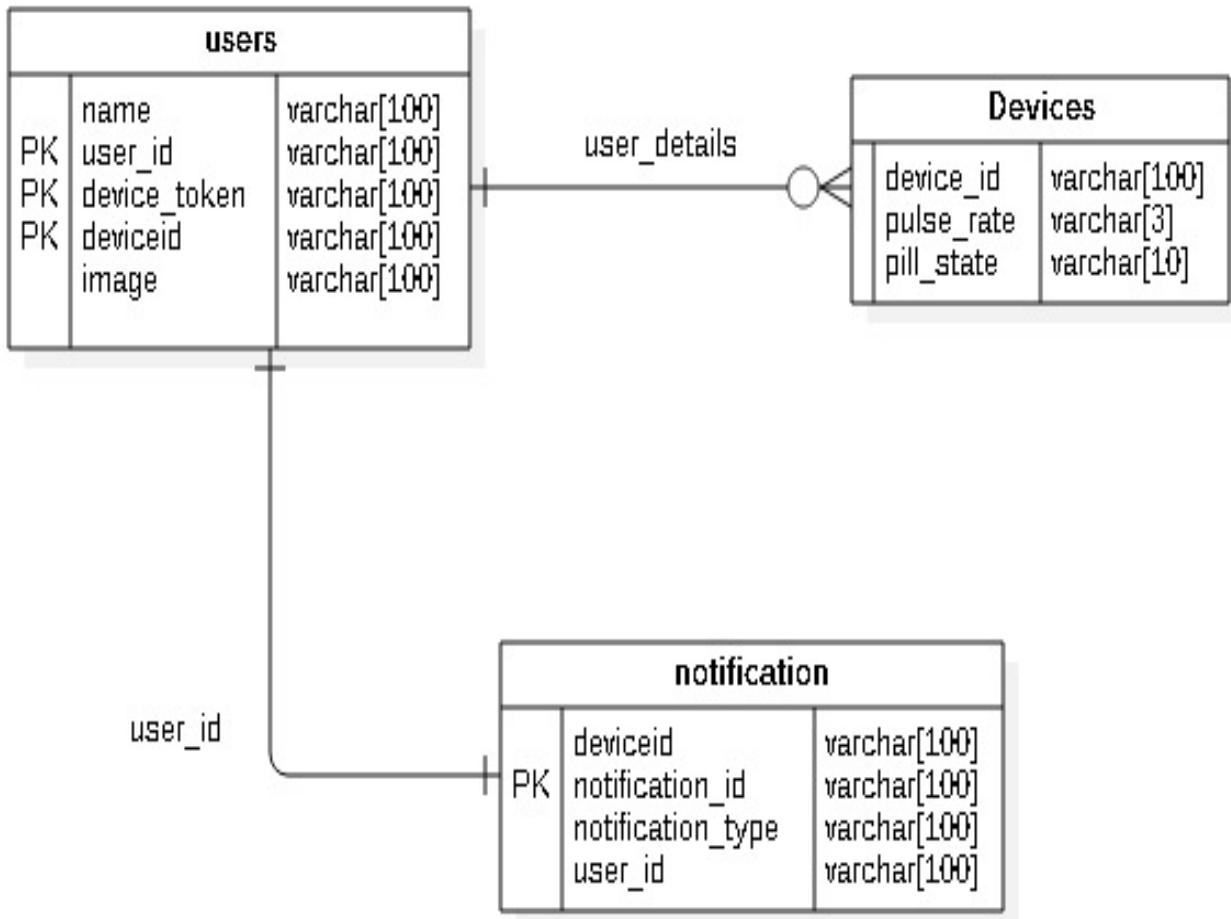
4.4 Sequence Diagram



4.5 Activity Diagram



4.6 ER Diagram



Chapter 5

System Testing

These results we have got during testing the device manually and came as we expected. The following table shows the test cases with the results.

5.1 Test Cases and Test Results

Test ID	Test Case Title	Test Condition	System Behavior	Expected Result
T01	Pill Alert	Normal	The alarm triggered	The alarm to be triggered
T02	Pulse Alert	Normal	Alert Notification Triggered	The alert notification on crossing the pre-set threshold
T03	Pulse Rate Graph	Normal	Graph Displayed	Graph to be displayed

Note: Testing should be performed manually

Chapter 6

Project Planning

We thought of a problem statement which is basically for offering data and reminder to the user.

- Medicine Timings: We gathered the requirement after analysis the problem.
- We build use case diagram according to the above requirement and analyzed.
Two actors: Registered Users and Devices
- We analyzed all the almost all possible negative aspects and dealt with them.
- We are planning to upgrade our prototype according to user feedback.

Chapter 7

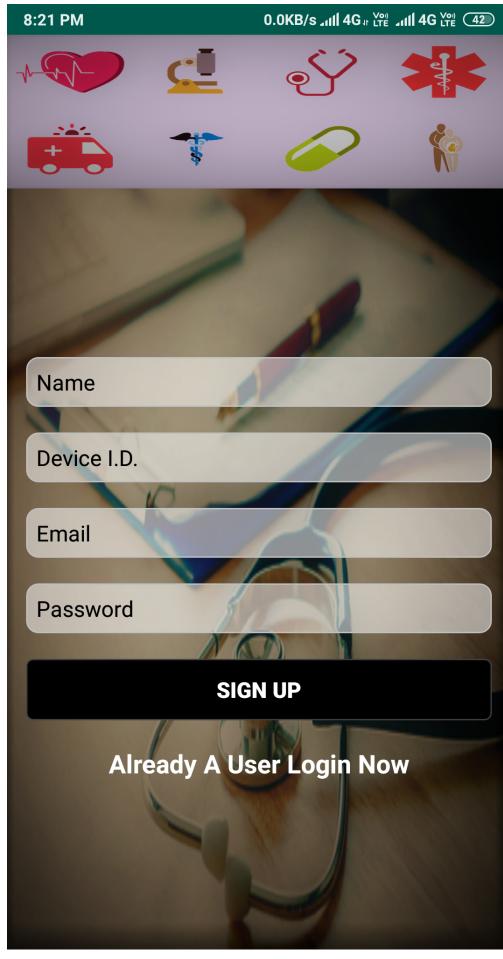
Implementation

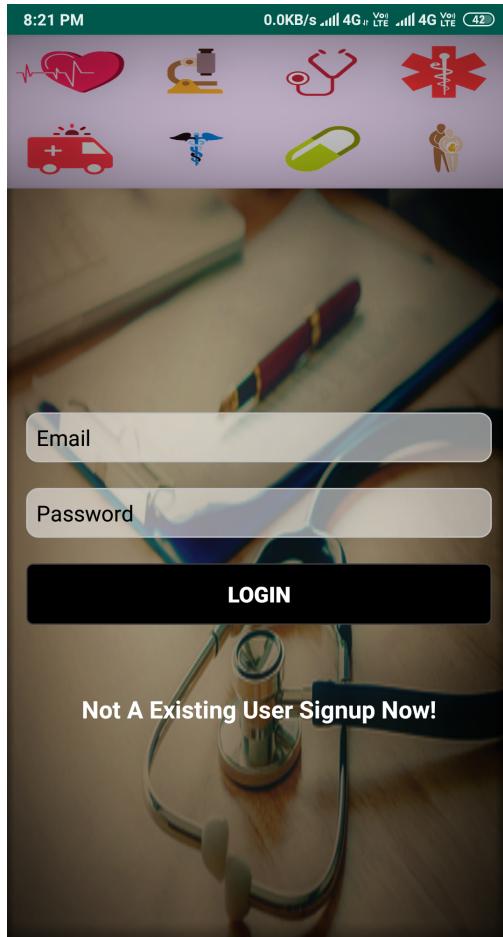
- The NodeMCU is configured to connect to the hotspot to send or receive data.
- The Android application is completed and is working as expected.
- Firebase Function is sending correct notification to our Application
- We are taking feedback about our application UI and our prototype for improvements to our service.
- The reminder alert system is working fine.

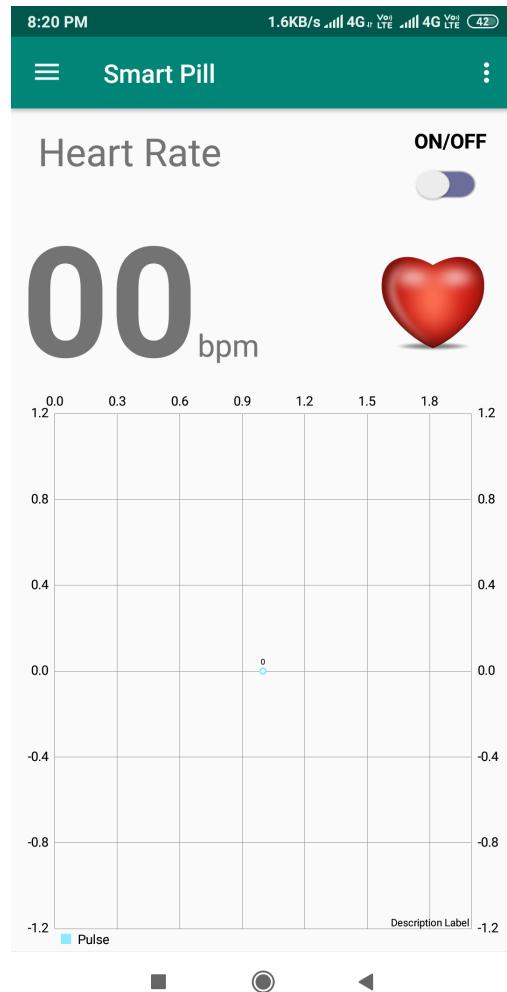
Chapter 8

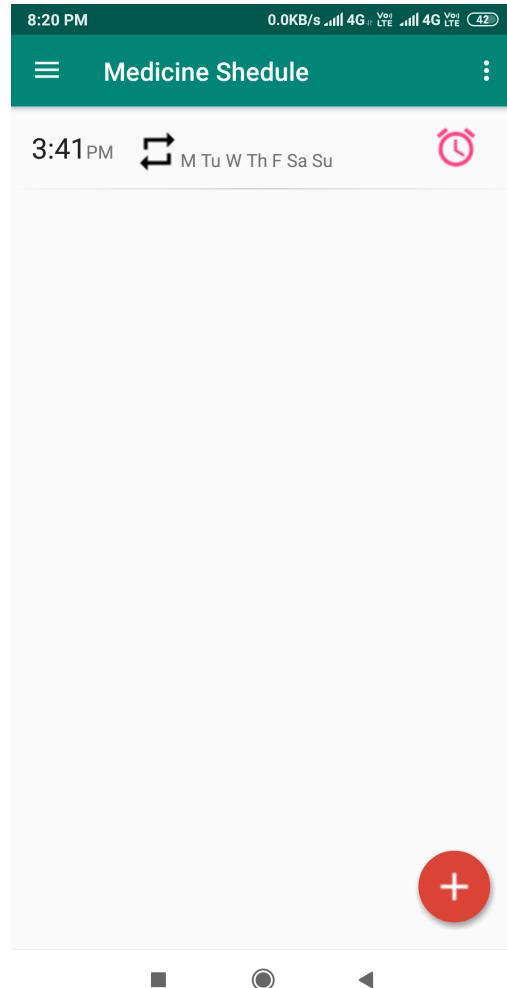
Screenshots of Project

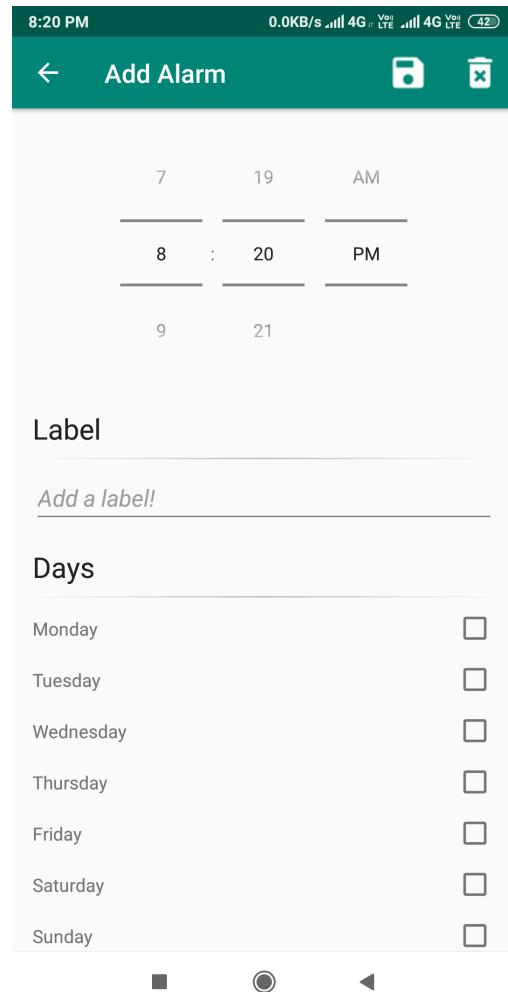


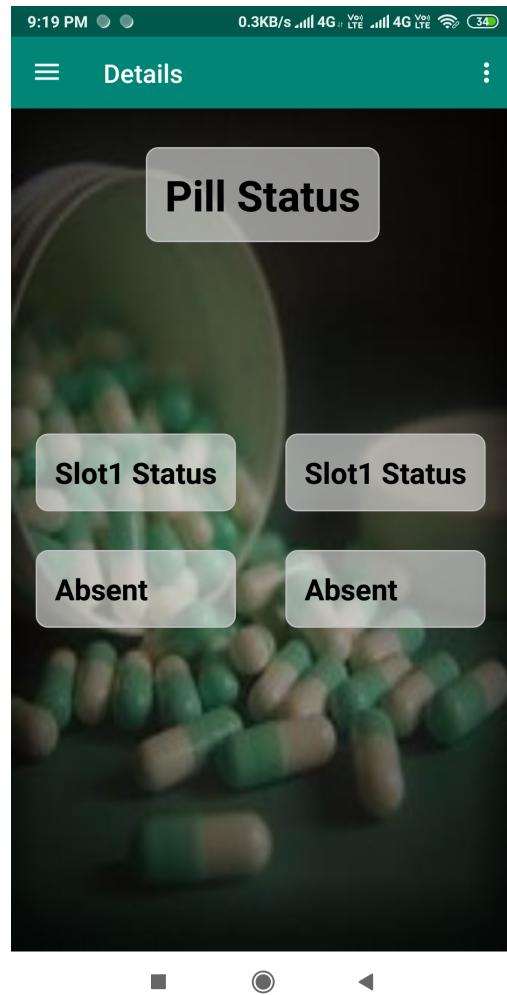


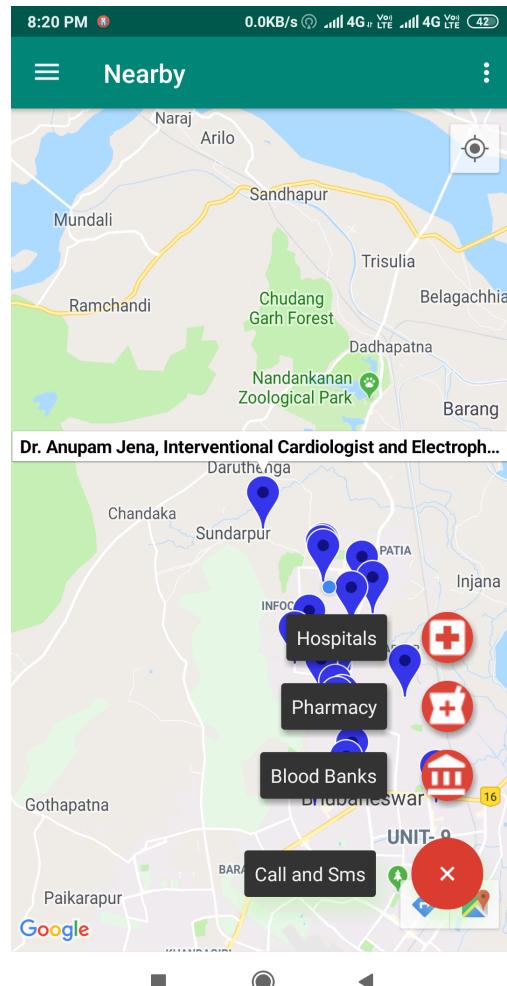


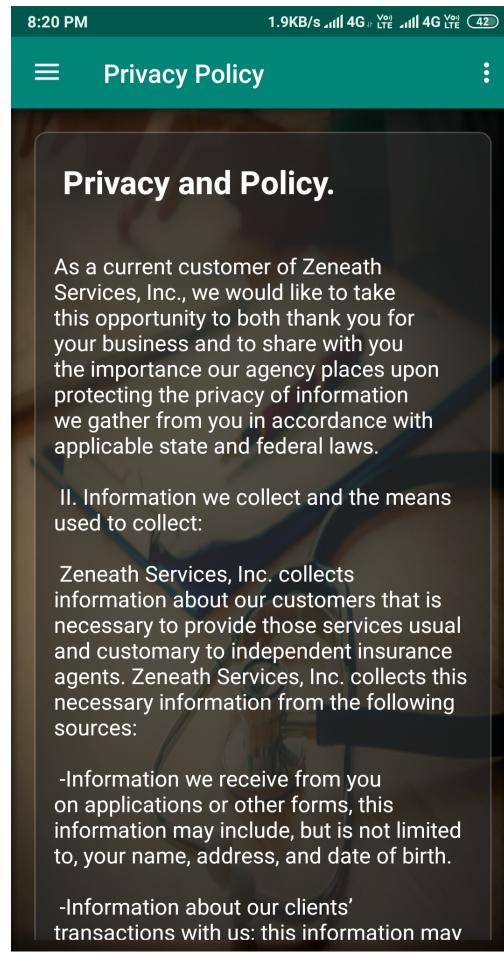


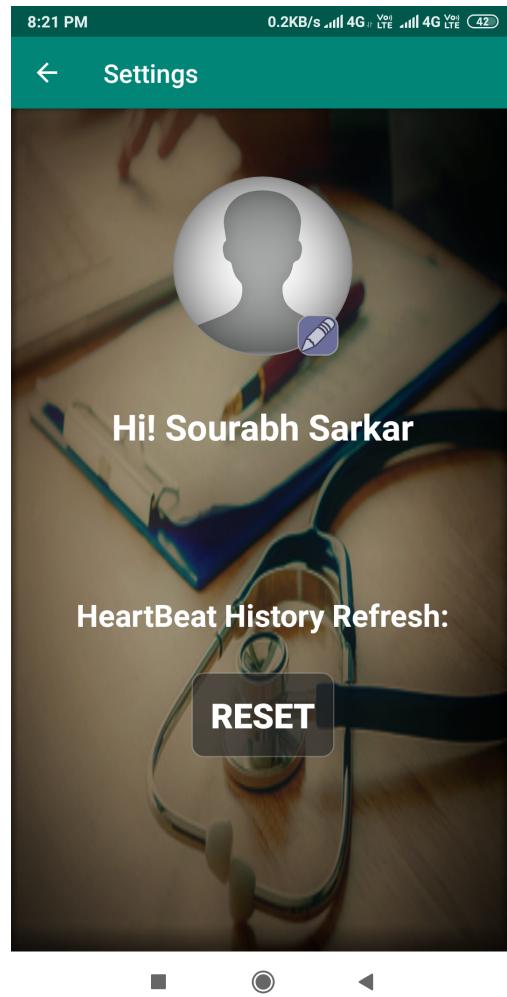












Chapter 9

Conclusion and Future Scope

9.1 Conclusion

This task has concentrated on the issues looked by senior natives concerning adherence to their recommended medicine. It helps the older who live freely as well as the guardians of the old by helping perfect add up to remember drug at the opportune time. The brilliant medication box utilizing install stage has just been tentatively demonstrated to work agreeably. This medication box alongside the android application is a kind of self-loader can demonstrate helpful and an easy to understand instrument for us all. It encourages it to be cost proficient too. The other favorable position of this crate is that it is anything but difficult to utilize and the intricacy is less. This guarantees the old patient expends the correct dose of drug at the ideal time, gave the person acknowledges this new, irregular technique for prescription. The portable application constructed additionally screens the heart beat rate and informs of any irregularity., adjacent drug store, medical clinics and Blood banks.

9.2 Future Scope

In the future, we chose to include the element of checking the quantity of pills. That will be useful for the client to get continuous prescription since it will almost certainly alert the client or patient on coming to the pre-set limit through notification.

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