

# CliniConnect

## Group 1

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## **Project Goal and Objectives (revised)**

**Overall goal:** This application is to improve contact between patient (in particular, low income demographic) and there clinic which they attend.

### **Objectives:**

We are planning to create a mobile application that will do the following:

- Patient can fill the form prior to clinic appointment, which in turn reduce the patient and doctor waiting time and will also improve the wait time in busy inner city clinics.
- Patient can fill the exit satisfaction form as per his comfort.
- Patient will be able to get his lab order for bloodwork etc.... electronically, which can be scanned.
- Patient will get reminder notification of his appointment.
- Patient who are required to monitor their blood pressure and blood sugar daily or weekly can keep track of their readings using this application.
- A map that will show from whatever location opened, the directions to the clinic, this would benefits patients who may require rides from friends or family members unfamiliar with the location of the clinic.
- Administrator will be able to administer the application using admin page.

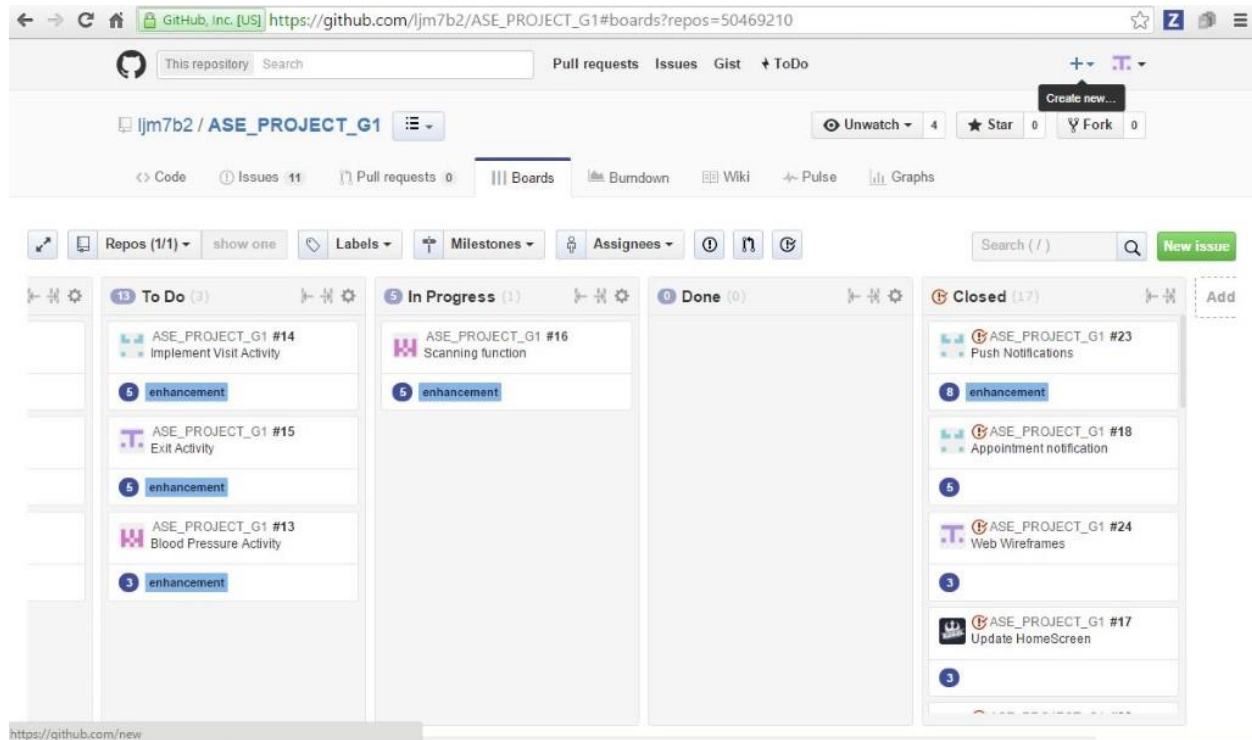
### **Features:**

- New patient can be registered in the registration page of the web application.
- Already registered patient can login to the application using the login page.
- Prior clinic visit form page with the exact replica of the actual physical form.
- Exit satisfaction form page.
- Bloodwork details page with the facility to be scanned by pathology labs.
- Reminder icon on the status bar for the upcoming appointment.
- Blood pressure page for updating and keeping track of daily or weekly blood pressure readings.
- Blood sugar page for updating and keeping track for blood sugar readings.
- A map that will show from whatever location opened, the directions to the clinic, this would benefits patients who may require rides from friends or family members unfamiliar with the location of the clinic.
- Administrator can add new patient to the system, send blood work notification to the patient.

**Significance:** While some patient-to-clinic apps exist, they are typically patient portals which can contain an overwhelmingly large amount of data and features. By streamlining a few key important services we can help increase patient health.

## Project Plan

### Zenhub screenshot



### Schedule for the four different increments.

**Stories (Issues):** The fourth increment ties up all the loose ends we had with our service. Forms were added to have the Users fill out a survey about their experience at the clinic. The Administration side can also view these surveys. The User Application's vitals log, previously called blood log utility, has been updated to take in new and more information. When the Admin registers a User, that User will get an mail to the User provided e-mail address. Additionally, both user and admin sides have undergone thorough testing and debugging, making sure that everything is running smoothly from end to end.

**Service Design:** The service design at this stage is the completion of the service as a whole. Users can fill out a brief survey about the experience they had at the clinic. Admin can view and print exit surveys to use for their internal improvement. The User receives an e-mail when the Admin registers a new patient. The User has more options to update in the new vitals log area, allowing the administration to have a better understanding of the User's conditions.

**Service Implementation:** A new version of the vitals log has been implemented in this increment. Also, exit survey forms have been added to the User application. Using MailJS, an e-mail service has been implemented in the administration side. Also, a connection to these surveys has been implemented on the administration side.

#### **Project Timelines, Members, Task Responsibility:**

The work division has been made in Zenhub please check our board for more detail.

[https://github.com/ljm7b2/ASE\\_PROJECT\\_G1/milestones#boards?repos=50469210](https://github.com/ljm7b2/ASE_PROJECT_G1/milestones#boards?repos=50469210)

**User Stories:** When the User, in addition to the existing blood log information there are new elements that the User can update and can input the information into the vitals log portion of the user app. When the User wants to leave a review of the experience that they had at the clinic they can fill out an exit survey which can be seen by the Administration page as soon as the information is submitted.

#### **Use Case**

**Service description:** CliniConnect is an service that helps patients handle their paperwork in an organized and timely fashion. The application is intended for those who either do not have the time to come early to an appointment to fill out paperwork, have a tendency to miss/forget appointments and even those who need more constant interaction with their medical clinic. The service includes an administration portal that serves as to connect the administration to the user. This service allows administrators to keep their patients properly up to date.

### **Fourth Increment Report**

In this fourth increment of “**CliniConnect**” we have implemented versions that follow the overall structure and flow of the application and administration wireframes and UML diagrams. In this phase we have updated the options available to the user in the vitals log. Included in this increment, is the ability to fill out forms for the exit survey. Also, we have made various changes to make the interface more user friendly.

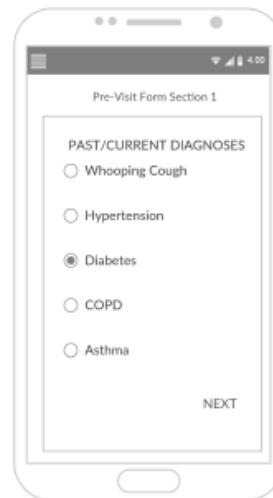
## Detail Design: Wireframes



HOMESCREEN



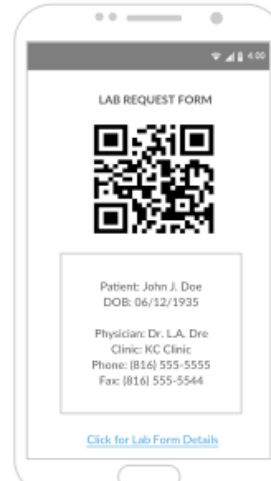
NAVIGATION SIDEBAR



FORM VISIT PAPERWORK  
(SHOWING ONE SECTION OF FORM)




LOGIN



## Web Wireframes:


CliniConnect



Host Clinic Information


Home Register Patient Notify Patient Patient Forms

05/06/2015



Appointments	Times	Physicians
Mark Davis	12:40	Dr. Klotz
William Thomas	12:50	Dr. Frankenfurter
Jeremy Wong	1:30	Dr. Bleh
Clyde Frosch	1:45	Dr. Klotz
Ingrid Hasslebeck	2:35	Dr. Bleh
Michael Wolfe	2:50	Dr. Frankenfurter
Shenae Wallace	3:20	Dr. Bleh

CliniConnect



Host Clinic Information

Home Register Patient Notify Patient Patient Forms

First Name

Last Name


Address

Phone Number

Insurance Policy

Insurance Policy Number

CliniConnect



Host Clinic Information

HomeRegister PatientNotify PatientPatient Forms

Patient Lookup

Search

Print Blood Log

Patient Name  
Patient Address  
Patient Phone  
Patient Insurance  
Policy

Next Appointment: @Time

Paperwork up to date?  
Yes/No


Lab work needed

Remind

Send Digital Paperwork

Send Lab Request

CliniConnect



Host Clinic Information

HomeRegister PatientNotify PatientPatient Forms

First Name

Last Name

Address

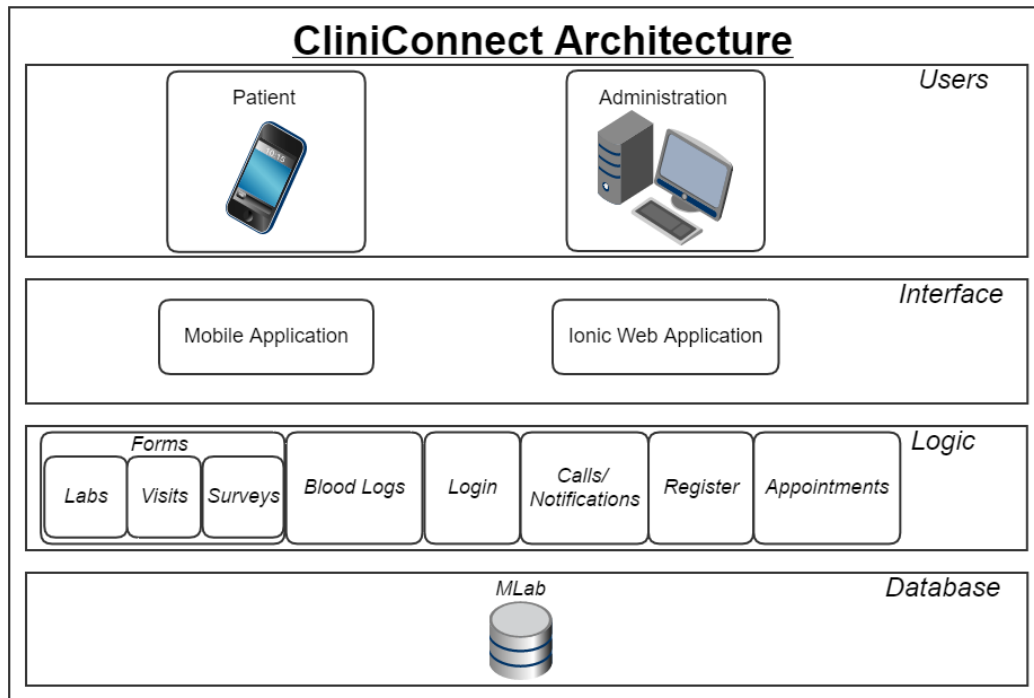
Phone number

User Email

Password

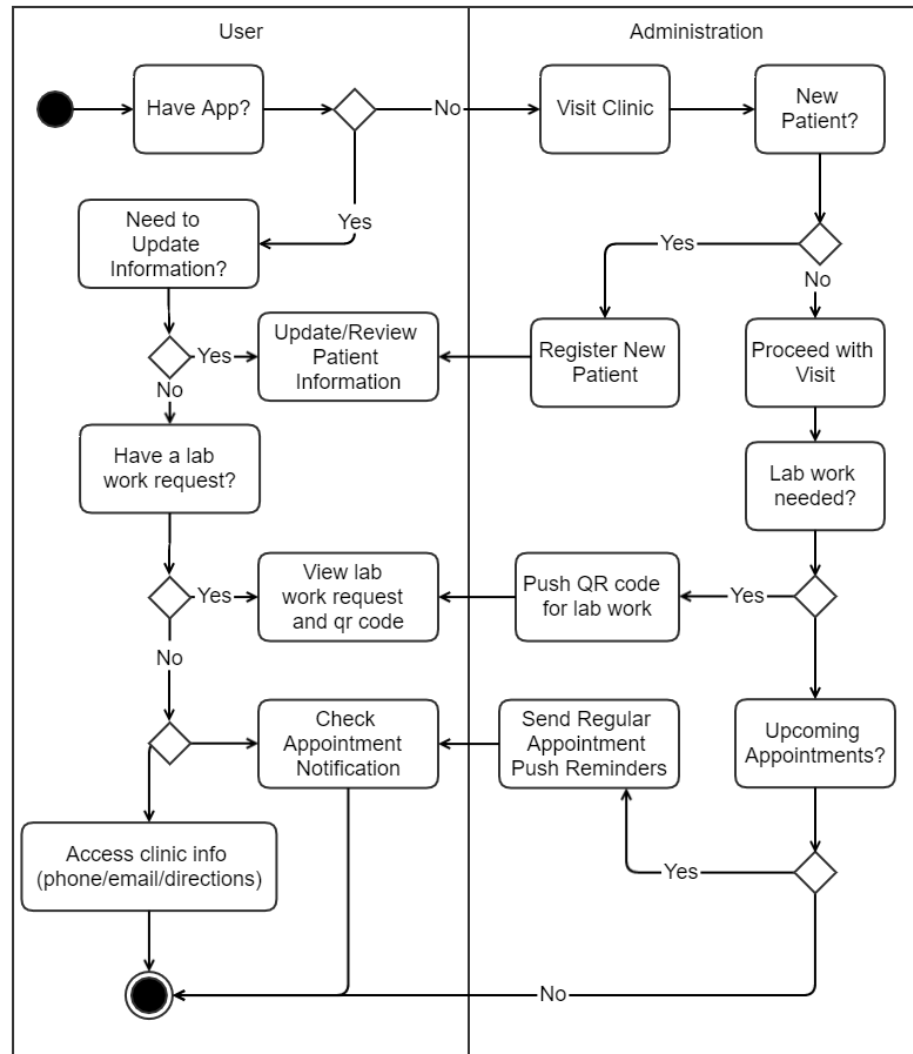
Register New Patient

Architecture Diagram:



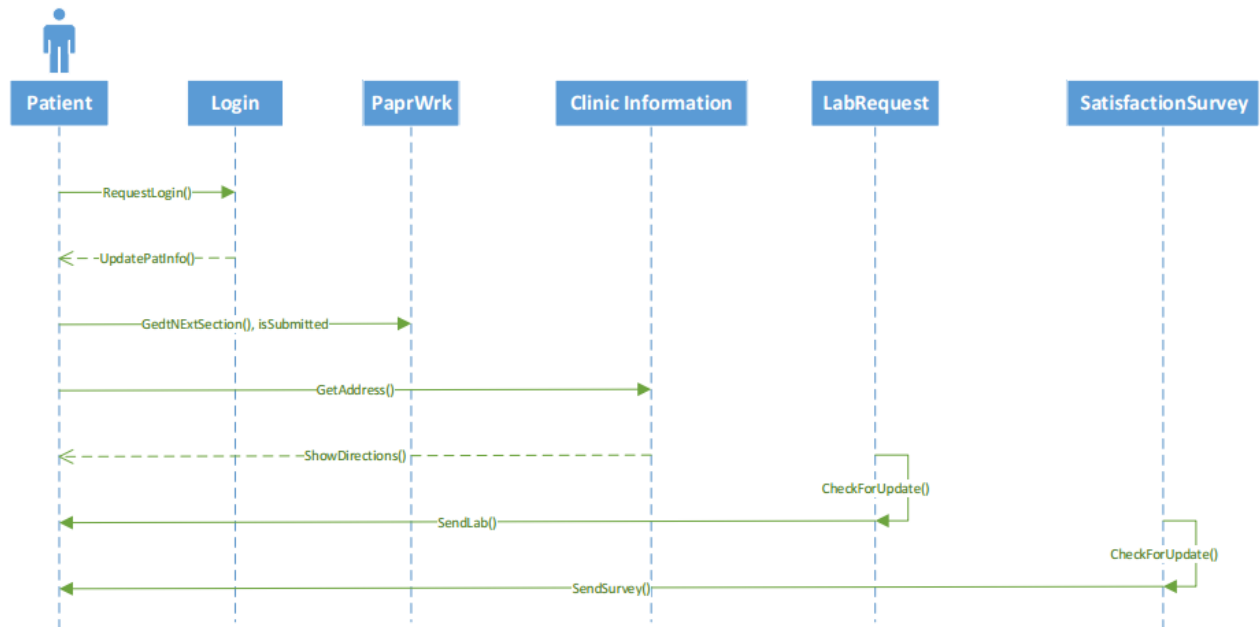


Activity Diagram:

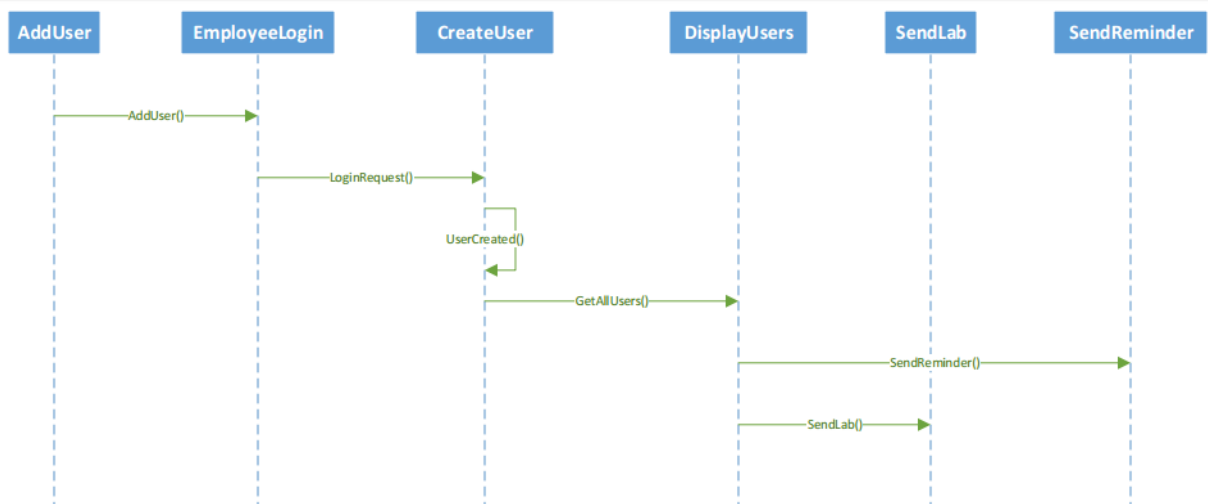


Sequence diagrams:

## User Sequence Diagram

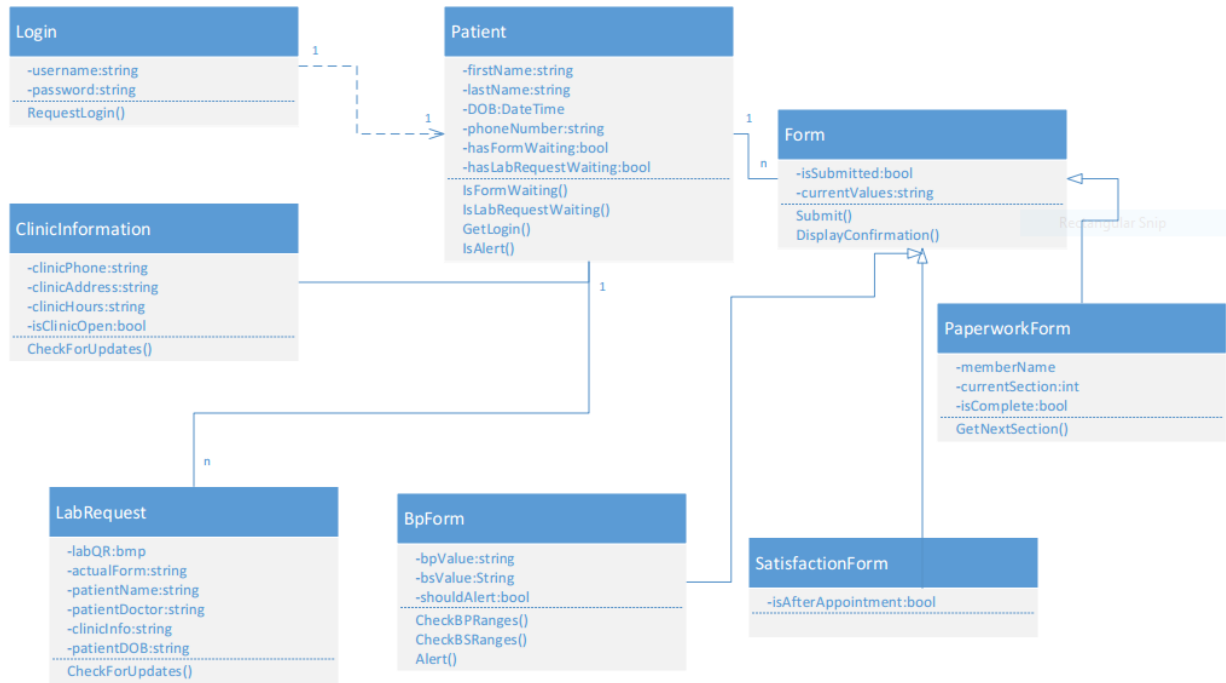


## Administration Sequence Diagram

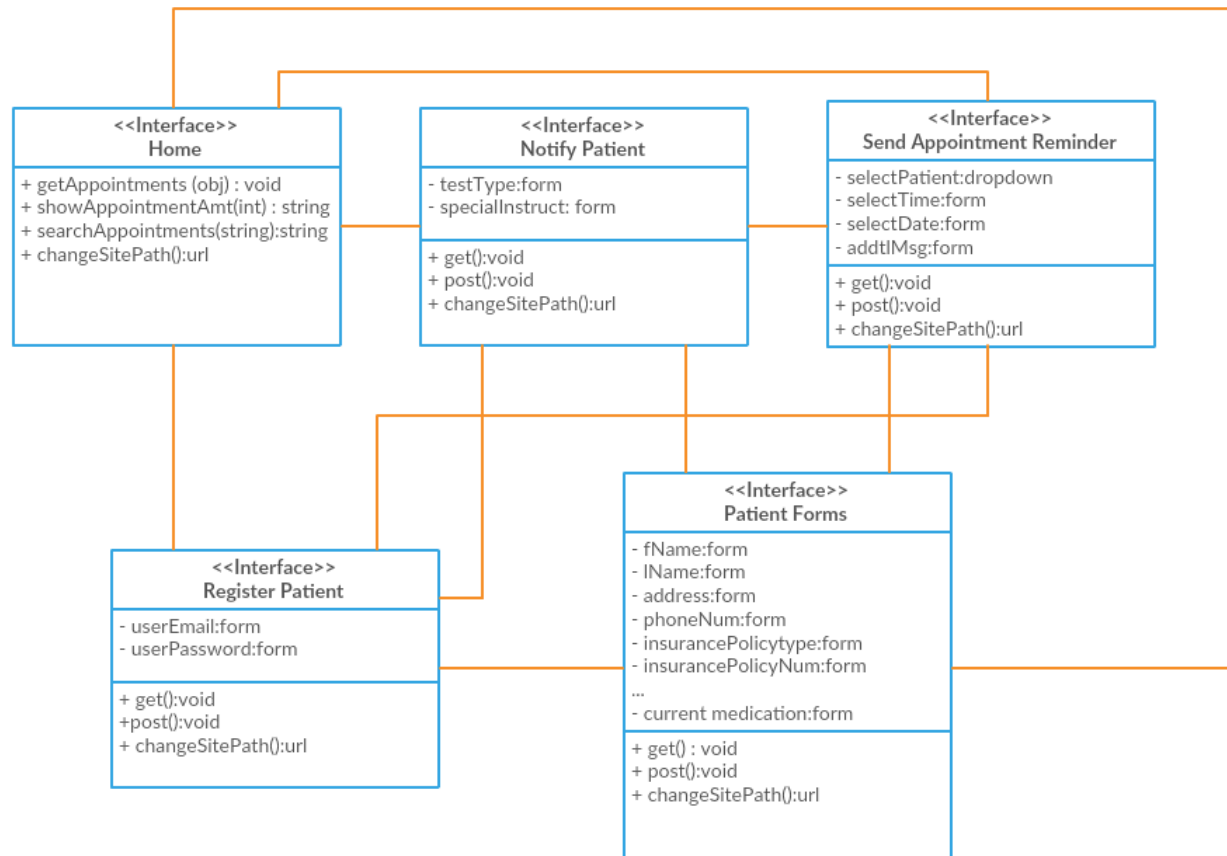


## Class diagrams:

## Android



Web



### Used existing Services/API

#### Frameworks:

- **Ionic** – AngularJS framework used for Admin web page.
- **Android SDK** – Java framework for Android Apps.
- **GCM** – Google Cloud Messaging used for sending push notifications to users.

#### APIs:

- **Google Maps:** Used to get directions from the user's current location to the clinic in Google Maps.
- **ZXing (Zebra Crossing):** Used to convert lab request information into QRcode.

#### Widgets:

- **Phone Widget:** When selected, the user can call the clinic using existing phone services on the phone like Google Hangouts Dialer or the Phone Dialer.
- **Email Widget:** When Selected, the user can email the clinic using existing email applications on the phone like E-mail, GM
- **ImageView Widget:** Used to display the QR code after it had been processed by ZXing.

- **TextView Widget:** Used to display information about the information embedded in the QR code.

### Services:

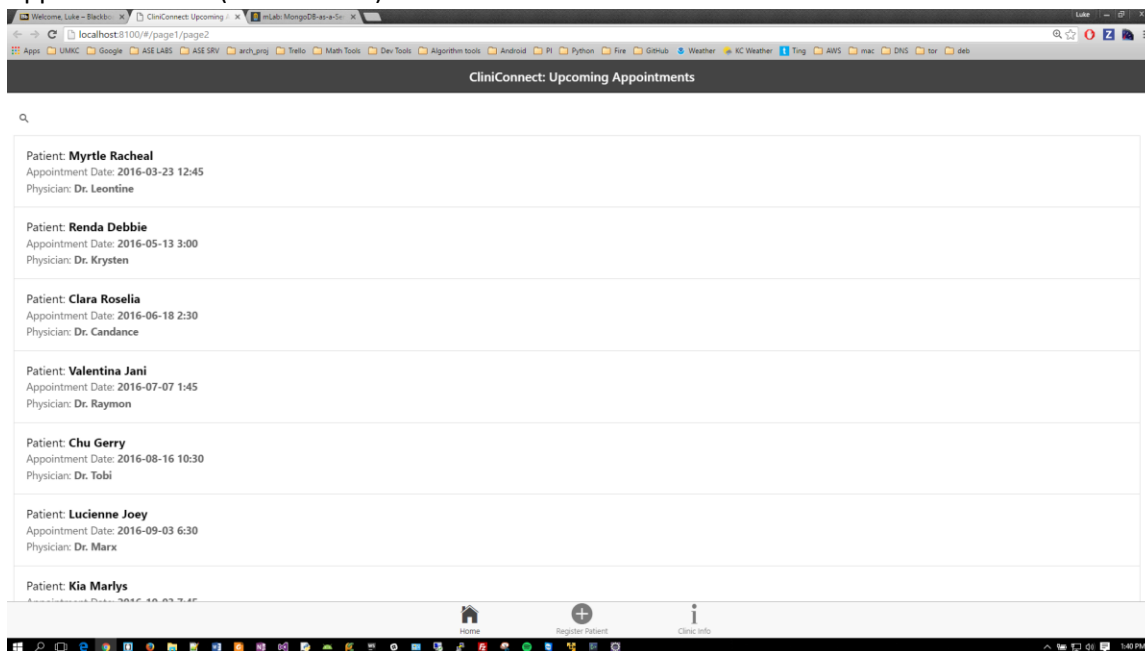
- **Amazon Web Services – EC2:** Used to host admin website as well as tomcat8 server.
- **MLab** - Mongo as a service.
- **MailJS** - Javascript email service, sends mail to a newly registered user.

### Implementation and Deployment:

We have implemented an ionic framework for the admin web site, the blood log activity for user and admin sides, and the visit forms for admin and users. The admin website has been implemented with Apache http server on Amazon Web Services. [A link to the admin site page.](#) Below are the screenshots.

### Web Page:

#### Appointment List (New Format):



## Exit Survey Results Pg1:

The screenshot displays a web application interface for viewing exit survey results. The browser address bar shows the URL: `ec2-52-91-251-221.compute-1.amazonaws.com/CliniConnectAdmin/#/page1/page2`. The application has a sidebar with a search bar and a list of items including Patient, Appointment, and Physician. The main content area is titled "Post-Visit Survey: admin admin" and contains a table of survey results.

Date Submitted	Appointment Date	Patient
April 23rd 2016, 4:49 AM	November 7th 2016, 12:30 PM	admin admin
April 23rd 2016, 4:42 AM	November 7th 2016, 12:30 PM	admin admin
April 23rd 2016, 4:30 AM	November 7th 2016, 12:30 PM	admin admin

The bottom navigation bar includes icons for Patient Details, Check Log, Pre-Visit Forms, Post-Visit Survey (active), Appointment, and Send Labs.

## Exit Survey Results Pg2:

The screenshot displays the second page of the exit survey results, showing detailed responses for three different survey submissions. The browser address bar shows the same URL as the first page. The application interface is consistent with the first page.

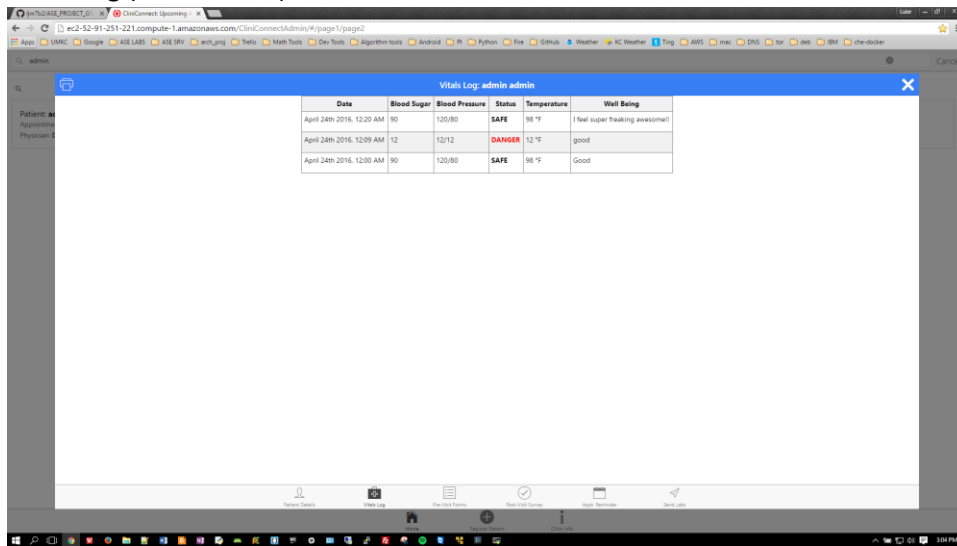
Date Submitted	Appointment Date	Patient
November 7th 2016, 12:30 PM	November 7th 2016, 12:30 PM	admin admin
November 7th 2016, 12:30 PM	November 7th 2016, 12:30 PM	admin admin
November 7th 2016, 12:30 PM	November 7th 2016, 12:30 PM	admin admin

The detailed responses for the three surveys are as follows:

- Survey 1:**
  - 1. How likely is it that you would recommend your Doctor to a friend or family member?  
10 - Extremely Likely
- Survey 2:**
  - 2. Overall, how satisfied or dissatisfied were you with your last visit to our office?  
Very satisfied
- Survey 3:**
  - 3. How easy or difficult was it to schedule your appointment at a time that was convenient for you?  
Very easy
  - 4. How convenient was the appointment time you were able to get?  
Extremely convenient
  - 5. In your opinion, how convenient is the location of our office?  
Extremely convenient
  - 6. Overall, how would you rate the service you received from the staff at our office?  
Excellent
  - 7. Overall, how would you rate the care you received from your Doctor?  
Excellent
  - 8. How well did your Doctor explain your treatment option?  
Extremely well
  - 9. Is there anything we could have done to improve your last visit?  
Excellent

The bottom navigation bar is identical to the first page, with the "Post-Visit Survey" icon being active.


## Vitals Log (New format):



Date	Blood Sugar	Blood Pressure	Status	Temperature	Well Being
April 24th 2016, 12:20 AM	90	120/80	SAFE	98 °F	I feel super freakin awesome!
April 24th 2016, 12:09 AM	12	12/12	DANGER	12 °F	good
April 24th 2016, 12:00 AM	90	120/80	SAFE	98 °F	Good

## Patient App:


## Vitals Log (Updated):




3:01

←


Daily Vitals Log




Enter Blood Sugar (mg/dL).



Blood Pressure. (Systolic) (Diastolic)




Enter Body Temperature in °F.



Please describe how are you feeling right now.

SUBMIT SELF REPORT



Exit Survey:



1. HOW LIKELY IS IT THAT YOU WOULD RECOMMEND YOUR DOCTOR TO A FRIEND OR FAMILY MEMBER?

Please select an option Select
2. OVERALL, HOW SATISFIED OR DISSATISFIED WERE YOU WITH YOUR LAST VISIT TO OUR OFFICE?

Please select an option Select
3. HOW EASY OR DIFFICULT WAS IT TO SCHEDULE YOUR APPOINTMENT AT A TIME THAT WAS CONVENIENT FOR YOU?

Please select an option Select
4. HOW CONVENIENT WAS THE APPOINTMENT TIME YOU WERE ABLE TO GET?

Please select an option Select
5. IN YOUR OPINION, HOW CONVENIENT IS THE LOCATION OF OUR OFFICE?

Please select an option Select
6. OVERALL, HOW WOULD YOU RATE THE SERVICE YOU RECEIVED FROM THE STAFF AT OUR OFFICE?

Please select an option Select
7. OVERALL, HOW WOULD YOU RATE THE CARE YOU RECEIVED FROM YOUR DOCTOR?

Please select an option Select
8. HOW WELL DID YOUR DOCTOR EXPLAIN YOUR TREATMENT OPTION?

Please select an option Select
9. IS THERE ANYTHING WE COULD HAVE DONE TO IMPROVE YOUR LAST VISIT?

Please Enter Here
10. HOW WELL DID YOUR DOCTOR EXPLAIN YOUR FOLLOW-UP CARE?

Please select an option Select

### Unit Test Cases:

JUnits:

```
import static org.junit.Assert.assertEquals;

import org.junit.Test;

public class LevelMonitorTest {

    @Test
    public void isBloodPressureSafeTrueTest() {
        String BP = "120/80";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(true, lm.isBloodPressureSafe(BP));
    }

    @Test
    public void isBloodPressureSafeFalseHighTest() {
        String BP = "145/95";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(false, lm.isBloodPressureSafe(BP));
    }

    @Test
    public void isBloodPressureSafeFalseLowTest() {
        String BP = "85/55";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(false, lm.isBloodPressureSafe(BP));
    }

    @Test
    public void isBloodSugarSafeTrueTest(){
        String BS = "150";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(true, lm.isBloodSugarSafe(BS));
    }

    @Test
    public void isBloodSugarSafeTrueTest(){
        String BS = "150";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(true, lm.isBloodSugarSafe(BS));
    }

    @Test
    public void isBloodSugarSafeFalseHighTest(){
        String BS = "301";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(false, lm.isBloodSugarSafe(BS));
    }

    @Test
    public void isBloodSugarSafeFalseLowTest(){
        String BS = "69";
        LevelMonitor lm = new LevelMonitor();
        assertEquals(false, lm.isBloodSugarSafe(BS));
    }
}
```

```

import static org.junit.Assert.assertEquals;
import org.json.*;
import org.junit.Test;

public class GetClinicInfoTest {

    @Test
    public void buildClinicInfoTest() throws JSONException {
        GetClinicInfo gci = new GetClinicInfo();
        JSONObject info = gci.buildClinicInfo("loc1", "umkc", "555-5555", "a@a.com",
"7-8");

        assertEquals(info.get("clinicName"), "loc1");
        assertEquals(info.get("clinicAddress"), "umkc");
        assertEquals(info.get("clinicPhone"), "555-5555");
        assertEquals(info.get("clinicEmail"), "a@a.com");
        assertEquals(info.get("clinicHours"), "7-8");
    }
}

```

Yslow:

## Implementation status report

### Work completed:

The work completed in this increment was, the implementation of the exit survey, the vitals log update, slight changes to the interface of the admin site, sending an e-mail to the user to confirm registration, final comprehensive testing, the presentation PowerPoint and the presentation video.

### **Responsibility (Task, Person)**

In this increment, the main focus was to complete the project and be able to present a cohesive system. Shweta updated the vitals log and worked on the PowerPoint. Sri handled the exit survey forms for both user and admin. Ben, wrote the report, made the video and assisted with final testing and bug reporting. Luke updated changes to the admin site to make it user friendly, such as adjusting display formatting and adding an email sent for user registration confirmation, as well as performing testing and debugging.

### **Bibliography**

- Wireframes design <http://creately.com/> , <https://www.gliffy.com/home/>
- Testing Information:
  - <http://developer.android.com/tools/testing-support-library/index.html>
  - <http://yslow.org>
- Android Studio <http://developer.android.com/sdk/index.html>
- Google Maps API <https://developers.google.com/maps/>

**Github:** [https://github.com/ljm7b2/ASE\\_PROJECT\\_G1](https://github.com/ljm7b2/ASE_PROJECT_G1)