Team 5

Project Name: **BOILER LABS**

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1. **Problem Statement**:
There is no application for the Android platform that can locate an ITaP Computer Lab (with available computers) that is nearest to the user.

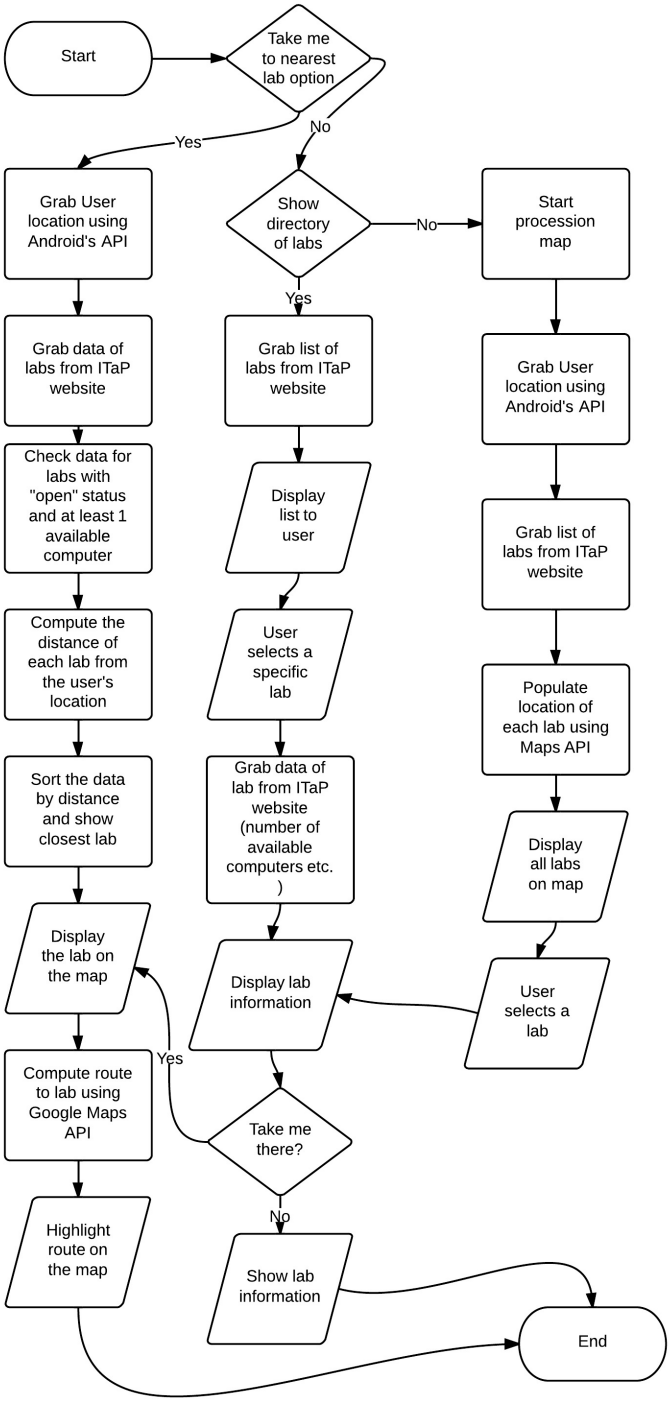
2. **Background:**
Purdue has a campus that is more than 2500 square acres in area and students often have problems in locating ITaP labs that are near them. There is no app on the Android platform that helps users in locating an ITaP lab (with available computers) that is nearest to them. This app is targeted at the student body of Purdue. There is an official iOS application titled “Purdue” that performs a similar task.

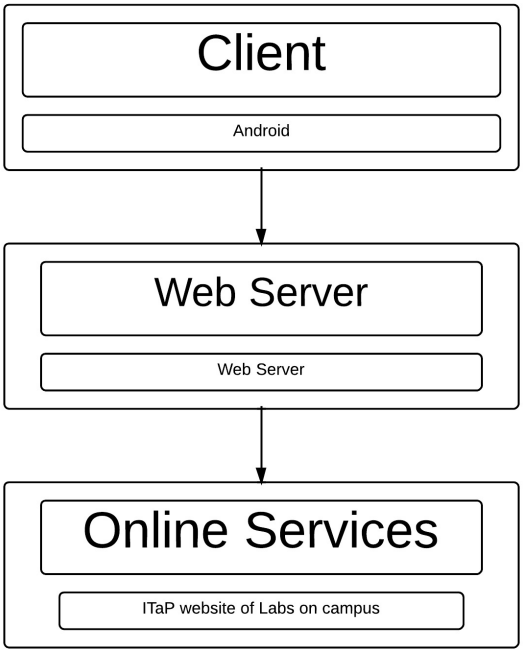
<u>The app on iOS has the following limitations:</u>
i) The list of labs displayed on the app is not complete. There are several ITaP labs that are not listed on the app.
ii) This app does not provide users with directions to a lab that is nearest to their current position.
iii) The user interface is not very appealing and the app as a whole is not easy to navigate.

<u>Measures taken to overcome these limitations:</u>

i) This application will be made available on the Android OS, making it the first of its kind that fulfills a crucial student need on campus.
ii) This app will display a list of all the ITaP labs across campus.
iii) This application will provide users with directions to a lab that is nearest to them.
iv) This application will have a superior interface and will be optimized for user ease-of-access.

3.a) Diagram


Start
Take me to nearest lab option
Yes
No
Grab User location using Android's API
Show directory of labs
No
Start procession map
Yes
Grab data of labs from ITaP website
Grab list of labs from ITaP website
Grab User location using Android's API
Check data for labs with "open" status and at least 1 available computer
Display list to user
Grab list of labs from ITaP website
Compute the distance of each lab from the user's location
User selects a specific lab
Populate location of each lab using Maps API
Sort the data by distance and show closest lab
Grab data of lab from ITaP website (number of available computers etc.)
Display all labs on map
Display the lab on the map
Display lab information
User selects a lab
Yes
Compute route to lab using Google Maps API
Take me there?
No
Highlight route on the map
Show lab information
End


Client
Android
Web Server
Web Server
Online Services
ITaP website of Labs on campus

b. Description of the interactions.

i)Interaction between Client and Online Services: The Client will receive the required data from the online services whenever necessary.

ii)Interaction between Web Server and Online Services: The web server receives data from the online services (primarily to determine which lab is the busiest lab).

iii)Interaction between Web Server and Client: The client can both send a query and receive and display the relevant data.

iv)Interaction between User and Client:

- The user can specify his current location to the client.
- The user can tell the client to locate the lab that is nearest to him/her.
- The user can specify to the client a “favorite” lab.
- The user can have the client display a directory of all the labs on campus, and then have the client display information on a lab of his choice.
- The user can have the client display a map of all the labs on campus.

USE CASES:

ACTOR ACTIONS	SYSTEM RESPONSE
a) Use case: Open app. 1. Click on “BOILER LABS” applications.	a) Use case: Open app 1. Cell phone launches application and displays main menu with the three options: take me to the nearest lab, directory of labs, map of campus with labs.
b) Use case: Find the ITaP lab that is nearest to the user. 1. Click on “Take me to the nearest lab” in the main menu.	b) Use case: Find the ITaP lab that is nearest to the user. 1. The application first obtains the users location. The application then obtains the data of the labs from ITaP, and displays the user with directions to the lab that is the least distance from his location.
c) Use case: Display information on a specific lab on campus. 1. Click on “Directory of labs”. 2. User selects a lab by clicking on it.	c) Use case: Display directory of all labs on campus. 1. The application obtains the list of all the ITaP labs from the website and displays it as a list to the user. 2. The application obtains the information on the available computers in the lab and displays the information.

d) Use case: Display campus map with all the labs marked on it. 1. Click on “Map” in the main menu. 2. The user selects a lab by clicking on it.	1. The application obtains the list of all the ITaP labs from the website and populates a map with the labs and displays this to the user . 2. The application obtains the information on the available computers in the lab and displays the information.

4. **Requirements** :

Must be done:
Functional:

1) **As a user, I want to be able to find the closest ITaP lab to me, along with directions to reach the lab.**
Show the user the ITaP lab that is closest to them, along with directions to reach that lab.

2)**As a user, I want to be able to view a list of all the ITaP labs across campus.**
List all ITaP labs : This application will display to the user a list of all ITaP labs across campus.

3)**As a user, I want to be able to view information about each ITaP lab, such as the number of computers available, the capacity of the lab, and the kind of hardware that is available in that lab.**
Show details of each ITaP lab.
The application will display:

- The number of computers available.
- The capacity of the lab, i.e., the total number of computers in that lab.
- The kind of hardware that the lab is running (Mac or Windows).
- The hours of operation,current status of the lab(open or closed).
- Picture of the lab.

4)**As a user, I would like to be able to view a map showing all the ITaP labs across campus along with my current location.**
Display a Map showing all the ITaP labs on campus and the current location of the user.

Non-Functional features:
1) **Performance**: The system as a whole should be able to perform well and attempt to mask slowdowns. For instance, if the internet speeds between the server and the client become slow, the client should not become unresponsive. It should still be interactive while data is synced asynchronously. As much of the processing load will be given to the web server as possible, since we do not know the exact hardware of the client. This will enable us to help keep performance as consistent as possible across clients.
2) **Reliability:** Reliability will be a main concern, mainly because if any portion of the system fails, the system as a whole becomes next to useless. While performance is a main concern as well, if the system is glitchy and unreliable, performance does not matter. We will attempt to balance these two requirements in a way that will maintain a

reliable system while achieving adequate performance.

3) **Usability:**

The Android app will conform to the modern Google app development guidelines. We will conduct hallway testing and ask people without any programming experience to use our application, and evaluate their feedback in order to improve usability.

4) **Security:**

Securing user data will be a primary concern. No personal data (such as login information) will be sent as plaintext over the internet. Also, we will ask the user to give permission (which will be persistent to enhance usability) before retrieving data.

Will be Done if time allows:

Functional requirements:

1. **As a user, I would like to be able to make an appointment with the Purdue writing labs.**

The user will be able to make an appointment with the Purdue writing labs.

2. **As a user, I would like to be able to have access to the public webcams for Lawson's labs.**

The application will provide the user with an option to access Lawson's public webcams for labs.

3. **As a user, I would like to be able to specify my favorite lab and view information of that lab on the application's homepage.**

The user will be able to specify his favorite lab. This will make the application display information about this lab on the homepage of the application.

4.As a user, I would like to be able to view which lab is the busiest lab at a particular time of the day.

The application will be able to perform calculations about which lab is the busiest lab by looking at the historical data of each lab.

Code repository:

We have chosen to use GitHub as our code repository. It is located at https://github.com/shalin94/BoilerLabs