# DOOWA

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***Abstract*—After living in the COVID-19 pandemic for approximately 2 years now, we decided that we want to make something that can alleviate people suffering during this pandemic. We came up with an Android mobile application called 'DOOWA'. The name DOOWA is derived from the Korean word '*deobda*' which means to help. The main function of our application is to connect individuals or families in the community who required assistance to survive during this pandemic to a donor in the community who are willing to lend a helping hand to reduce their hardship. We are hoping that this app will facilitate and encourage members of the community to help each other during this troubling times.**

***Index Terms*—DOOWA, Android Application, Assistance, Donation**

## I. Introduction

### A. Motivation

We focused on people who are financially less fortunate to be seen by the community. We created this mechanism to have a balanced community and people can reach out and seek help from others easily. There are families that are hugely affected, and many suffer from Covid-19. As much as we would like to get rid of any bad situations, it is still unavoidable and usually unexpected. The nature and consequences of these situations can vary significantly and in worst cases can also be life threatening. Therefore, we think that it would be nice to have some mechanism by which we can notify and get notified by certain people about such circumstances and increases the chances of giving and receiving help as soon as possible.

The need for such a mechanism increases even more as in this era of technology, platforms exist to support them. One such platform and a very common one in that a mobile application. Almost everyone today has an access to mobile app as they are easy to use and can be accessed by phone and tablets. Hence, this motivates our team to develop a mobile application for giving and receiving help in the community.

### B. Problem Statement

- Donor receivers are difficult in reaching out for help as they do not have access with other donors physically.

- Some receivers are not able to find the type of donations that they really need. As a result, the donation given is wasted.

- It is hard to contact between donors and receivers as they do not know each other before.

- We acknowledge that people in need can also request help from the government, but often times this help have to go through a long, bureaucratic application process before they are approved.

TABLE I
Role Assignments

| Roles | Name | Task Description |
|---|---|---|
| **User/ Customer** | Megat | Act as a beta tester to criticize and provide suggestions from a client point of view. They will provide how the application UI should look like to satisfy the ease of access from a user perspective. They also should test every feature in the app to identify bugs and report to the software developer. |
| **Software Developer** | Wan | The software developer should have the general point of view of how the application works overall. They will provide the services for backend server and database as well as providing the general UI of the frontend. |
| **Development Manager** | Amin | Development manager will be the main overseer of the project development, and gathers the information from the client side and handles the reports. They also will be the main proofreader for the project documentation to meet the project specification. |

### C. Research on any related software

1) *KakaoPay*

KakaoPay is a mobile payment and digital wallet service by Kakao based in South Korea that allows users make mobile payments and online transactions easily. It ensures smooth operations where users can make payments or do a money transfer via KakaoPay handily and there is no floating time for recipients to receive the money. It also lets users to invest with a small amount of money, get a loan for a house, and find the perfect insurance partner. Users can also save any credit or debit card information on it so that they can make one-time payment easily without filling in payment information once again with just only one tap. The service also supports contactless payments where users can send an amount of money to anyone they want to. Users can also notify recipients if they have successfully transferred the money and vice versa.

2) *PayPal*
PayPal is one of the world's largest payment services that is secured with advanced technologies. PayPal offers a worldwide payment service and supports Visa, MasterCard and so on. Users can sign up for PayPal account to have an extra level of security and fraud prevention with a quicker payment option and save payment details for future transactions. PayPal also lowest transaction fees for a global transaction, therefore users can freely use any card they prefer to use. Besides, it also offers reward points for each successful transactions that can later benefit users to transfer money wirelessly with even lower transaction fees. PayPal also has its own digital wallet that users can put money in so that users can directly transfer money without entering one's account numbers every single time.

3) *Yogiyo*
Yogiyo is a food delivery service application which enable users to get their food delivered at their doorstep from various restaurants easily. The application connects users to a variety of restaurants from different cuisines such as Western, Korean, Japanese and Chinese. One of the features of the application that we want to emulate is their delivery tracking feature. Through the application users can know the location of the delivery food rider in real time. Rider's location is represented by an icon on the map in the application, and the icon moves in relation to the rider's location. This is the feature that we want to have in our application so that whenever a meeting is set up, one person can know the location of the other party in real time and plan accordingly.

4) *Coupang*
Coupang is an online shopping application based in Seoul, South Korea that sells products from a wide-ranging category including food, clothing, fresh produce, baby products and many more. User can shop online in the comfort of their own home and have the products delivered on their doorsteps. In the application, users can know the current location of their parcel through an icon. Every time the parcel moves from the seller to the warehouse or currently in delivery, each and every stage of this process is shown to the user so that they can have the assurance that the product that they buy will arrive. We want to do the same thing with our application in case a donor wants to send products through the postal service.

5) *Google/Facebook Account*
Google and Facebook account is something that the majority of people have. We have also seen a lot of application nowadays which requires first time users to make an account if they want to use the services provided by the application. Similar to this, our application will also require first time user to register an account with us. However, instead of filling in their details one by one, we will allow users to use their already existing Google of Facebook account to register on our application. This will ensure smooth registration process and provide a hassle-free service to our users.

6) *AirAsia AVA*
Air Asia is one of the famous low-cost airline that is originated form Malaysia. Its website has a feature called AVA (AirAsia Virtual Allstar) which is an AI chat bot that can be used by the customer to help them undergo the booking and flight cancellation processes or even find any cheapest flight available at any time. Furthermore, AVA are implemented in AirAsia official application and also Facebook. On Facebook, you can start up a conversation with the official AirAsia Facebook account and it will be replied by AVA instantly. Additionally, this chat bot also has its own mobile phone number which can be used from WhatsApp, a messenger application and interact with the customers. Our goal is to implement this chat bot into our donation application so that our application can be fully interactive with any other social messenger application.

7) *SirenGPS*
SirenGPS integrates emergency management tools with real-time visibility and interoperability for emergency managers, first responders, and stakeholders in your community. This application also has a Siren Alert feature that can send real-time messages to specific groups, locations, buildings or your entire community. Siren Alert not only allows you to inform individuals of a crisis in their immediate vicinity, it lets you warn people as they approach a threat and steer them toward safety. With Siren Alert, you can also enable individuals in your community to respond back in real-time. Our application plans to integrate the Siren Alert feature and

enable anyone to alert any person nearby for donation.

## II. Requirement

### A. Functional Requirements

- **Account Creation**

The application should have an account creation system for the users before enabling them to access all the features on the app. On the main screen, there should be a button for sign up option. User will have to enter their email and password and these data will be stored in backend database. In addition, all email address should be unique and users cannot sign up with an already used email address. There should be no specific requirement for password but the application should display the strength of the password inputted by user. Upon completing the registration, a verification email should be sent to the new users' email address. All users will also have unique ID bind to their account.

- **Login**

Upon opening the application, the main screen should display the login menu with blank space for the users to input their email address and password. After the users entered their credentials, the inputted info will be sent to the backend server and it will search for matching email address and password combination in the database. In case of successful login, the application will inform the user that the login was successful and the user will be sent to the main page of the application. In failure case, the user will be rejected by the system and prompted to enter the correct combination. Alternatively, the application will provide the users another option to login via Google, Facebook or Twitter.

- **Chat Bot**

The application should provide a chat bot service to the users which let the users to ask questions and set a reminder. This chat bot should not use an AI approach, but rather a very simple approach where the users just type in the command and arguments and the bot will reply accordingly. The chat bot should have various kind of features and commands that covers all the users' needs.

- **Maps**

The application should have a map as the main interface. To implement this, the Google Maps API services will be used. On this map, it should show all the locations of the other users that are requesting for donation and nearby foodbanks. If the user is a donor, the map should show the location of where the donor is giving out the donation, the time available and the type of donation which will be indicated by an icon on the map. If the user is a receiver, the map will display their location for another donor to come and visit them and the severity of their desperation which will be indicated by color hue of their location. The locations of the two types of users should be indicated by the common map pin with different color each. If the location is an organization type donor, a special pin should be used.

- **Online Banking**

Donation can be made by physically or online transfer for money. The application should provide an online banking service for the users which let online money transfer between the users. Services such as Paypal, FPX banking and KakaoPay should be implemented.

- **Points for Donor**

Setting up points for donor every time they made a donation. This kind of grading system will allow us to identify frequent donors who will be rewarded accordingly with coupons based on their numbers of contribution. Donors will also be put into groups/level according to the points they accumulated.

- **Notifications**

The notification system in the app will pop-up whenever the help that you requested are answered by a donor. This will help the requester to be alert at all time.

- **Donor Rating**

The app will have a rating and review system for its donors and aid receivers. An aid receiver can rate their donor based on a 5-star rating system and also leave a review after they have received the help that the required. This system is put in place in order to prevent scams, and accounts who does not follows our community guidelines.

- **Reminder**

The app will also have a notification system where you can set, to remind you of the date and place of meeting to receive or deliver your donation. You can set the notification to pop up at 2 hours or 30 minutes before your meeting time.

- **Chat Room between Donor/Receiver**

The chat function between the donor and the receiver is important so that they can get more detailed information on what kind of help that they require. They can also use the chat function to set up time and place to meet if necessary.

- **Donor Tracker (postage/meeting)**

We believe that any form of help is important and should be facilitated. Therefore, in a case where the donor wanted to send the required items through postage, we will have a function where the app tracks the position of your postage. This will help the receiver to identify the location of the items that they so direly need at all times. This function can also be modified to tract the location of individuals on the way to the meeting spot which they have agreed upon beforehand.

- **Set a Face-to-Face Meeting**

This allows donators to have face-to-face meetings with the recipients within a specific time.

1) Click the “Time” to pop out the clock to set the meeting time.
2) Click the “Date” to pop out the calendar to set the meeting date and day.
3) Past dates cannot be clicked as there will be an error message.
4) The furthest appointment that can be made is one month ahead. Hence, user cannot make an appointment that is more than one month ahead.
5) There are no multiple appointments in one meeting. Therefore, if a date has been chosen for a meeting, user cannot reserve any other dates before cancelling the previous chosen date.
6) The dates must be agreed by both donator and the recipient. Click “Accept” button to agree the dates and “Reject” button to inform that one is not available for the chosen date.
7) If both parties agreed to the chosen dates, they then move to the confirmation page.

- **Choosing Types of Donation**

This allows donators to categorize their types of donations so that it is easier for recipients to seek for help with a specific type of donation.

1) Donators and recipients can choose which type of goods is important to them. This includes money, clothing, foods, baby items, gadgets, home essentials and others.
2) If Others is picked, user can state the type of donation that will be give or needed.
3) Once the type of donation is picked, then it will only show donator/recipient that have the same type of donation.
4) This will help donators and recipients to discover those who have the same interest.

- **Pictures Upload**

This allows users to upload pictures of themselves and the donations for confirmation and proof so that it will make the donation more precise and clearer.

1) Click ‘Camera’ button to connect the application to the camera.
2) The pictures taken are going to be stored and shared in the user’s profile for others to confirm them.
3) Click ‘Trash Bin’ button to delete pictures on the profile and there will be a pop-out whether to confirm the deletion.
4) Click ‘Sure’ for confirm deletion, and ‘Cancel’ to cancel the deletion request.

- **Guidelines and Manuals**

There is a guideline check for donators and recipients to follow to prevent any misbehavior and illegal actions throughout the donation process. This helps users to use the application properly.

1) Click ‘Guidelines’ to view the guidelines of the application that help users to understand better about the application operation.
2) For first-time user, click ‘Agree’ to accept and follow the guidelines given.
3) Click ‘Disagree’ if the guidelines if the user does not accept the guidelines of the application.

- **Report Button**

All entries from donor and receivers should comply with the terms and agreements of the application. Hence, for every entry, a report button must be provided. Whenever a user sees any other donor/receiver entry that does not comply with the guidelines, the user can use the report the button to alert the developers. This report feature should provide text box for what kind of terms violated. The report will be sent to the backend database and will be reviewed by the developers. Every report should have a unique ID and the severity point of the violation. The developer then will review the reports starting from the entry with the most severity points.

- **Terms and Conditions**

This will provide legal agreements between us and people who are using our application. Users must agree to abide the terms of the service (application) to use it. This can also act as a disclaimer for users to understand and aware of the terms and conditions that are applied.

Users must acknowledge that the application is collecting names, addresses, credit card information or other personal data from the users. The data given may be used, stored, and shared. Besides, any misbehavior and illegal actions would result in termination of the user accounts.

1) Before logging in, user is opted to read and understand all the terms and conditions in the application.
2) User must scroll through all the terms and conditions before clicking the ‘Agree’ button.
3) ‘Agree’ button will pop out if the user has scrolled through the terms and conditions.
4) Click ‘Disagree’ button if user does not accept the terms and conditions.
5) If the user clicked ‘Disagree’ button, user is unable to log in and eventually use the application.

### B. Non-Functional Requirements

- The application should have dark mode UI.
- The application should ask for satisfaction rating periodically
- The application should be simple enough to be accessible to elder users.
- The application must detect the internet connection before giving access to the users.

- The application should have an option to change language between English and Korean.
- The application must be ready before the final week of class.

## III. Development Environment

### A. Choice of Development Platform

1) Platform used

We have decided to use the latest Windows 10 and MacOS as our main development platform for this project. Windows 10 is a good choice for coding because it supports many programs and languages. In addition, it has significantly improved over other versions of Windows and comes with various customization and compatibility options. There are also many advantages to coding on Windows 10 over Mac or Linux. It also provides great security features, easy to upgrade and supports a huge range of programming language such as PHP, Android and XML which are some of the language that will be the main backbone of our program development. On the other hand, MacOS is a Unix-based operation system and is popular choice nowadays for programming. Programmers who work on a lot of back-end web server code often like MacOS for their personal computer, because it's based on Unix and easily runs nearly all Linux software.

2) Programming Language

- Java

We have decided to use Java as our main programming language for our project development; about 70 percent of it. We have chosen Java because first of all, the official language for Android development is Java. Large parts of Android are written in Java and its APIs are designed to be called primarily from Java. Plus, every beginner programmers, including us already have some experience in creating programs using this language. Moreover, this language is object-oriented which we think is for easier to use for developing an Android application since Java provides a various choices of GUI interface services. Moreover, Java provides a lot of libraries that can be used a lot for our program development such as Listeners, Fragments, Events, and much more. This language will be used for the frontend side of our program which handles the UI action such as the buttons actions after you clicked them or how the input by the users will be handled.

- XML

Extensible Markup Language (XML) is a great choice to be used in developing our application interfaces. We decided to use XML mainly because it is the main language that is being used by the Android Studio for UI designing and various widgets. Moreover, XML is designed to store and transport data and organize its data as a structure. Many UI frameworks use XML as the language to make the UI and once you understand values and attributes, you know enough to look at an XML file and understand the data within.

- PHP

We have decided to use PHP as our main programming language for the backend server to interact with the database. PHP is a popular general-purpose scripting language that is especially suited to web development. The reason why we are choosing PHP for this project is because our backend server will be communicate with the database through the Internet and we need to provide a universal domain which enables our application to fetch data from database while being connected to any type of Internet connection. Moreonver, there are a lot of ready made PHP code that provides various services which would be helpful to be integrated into our program.

- SQL

We will use SQL (Struted Query Language) for managing our database. It is a domain-specific language used in programming and designed for managing data that are in our relational database management system. It is particularly useful in handling structured data so this makes it possible to process data such as user accounts, donation requests, list of foodbanks, and map markers.

3) Cost Estimation

TABLE II
Cost Estimation

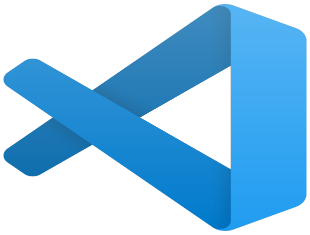
| Roles | Description | Cost |
|---|---|---|
| **Android Studio** | Frontend Code Editor | 0 |
| **Visual Studio Code** | Backend Code Editor | 0 |
| **Github** | Remote repository | 0 |
| **Heroku** | Backend Server | 0 |
| **MySQL** | Backend Database | 0 |
| **Overleaf** | Documentation typesetting program | 8 USD/month |
| **Google Meet** | Video Conference software | 0 |
| **KakaoTalk** | Chat application | 0 |

4) Information of Development Environment

- Android Studio

Android Studio provides the fastest tools for building apps on every type of Android device. For frontend, we can create complex layouts in a short amount of time because the layout can be designed by using the drag and drop feature provided by the IDE which will create the code by itself with zero compile error. After designing, the programmer can immediately see the result of the interface and how it will be look on our phone screen. Furthermore, it provides a fast and reliable Android phone simulator that can be used to preview your application on the phone right after the code is compiled. With this, we do not have to build the APK file and install it onto our phones every time we want to test the application. Finally, Android Studio can be run in Windows and MacOS which is perfect for our development environment.

- Visual Code Studio



We decide to use Visual Code Studio as the source code editor for PHP and SQL which will be handled by the backend because they have a built-in support and plugins for both of the programming language. IT also have the auto compile feature which can ease the process of testing our application without having to compile every time the code is edited.

- GitHub

Github is one of the most popular website to upload our sources code seamlessly as well as share and develop the program with all the teammates. Moreover, our teammates can easily check the commits done by other members and implement necessary update of the features. Github provides necessary management functions for software development such as basic functions of the Git which includes functional requests, task management, and bug tracking.

- Heroku

The reason why we choose Heroku as our backend server is because it provides a lot of services for a free price such as modules and ClearDB service which will be used as the direct connection between the server Heroku and the MySQL database. Furthermore, our team members are more well versed with the Heroku services which would speed up our application development much faster.

- MySQL

We will use MySQL for data management because as mentioned before, it can be directly connected with our Heroku server. Today, MySQL is the second ranking RDBMS solution in the world, according to DB Engines. Its users include a wide range of websites and applications, including household brands like Spotify, Netflix, Facebook and Booking.com. Finally, the data stored there can be easily viewed in tables.

- XAMPP

Xampp is a web server that hosts PHP websites. Furthermore, XAMPP has a built-in MySQL database setup. It also has a GUI for MySQL. As a result, when you install XAMPP server on your PC, the MySQL database is also installed. Which means you won't need to install a separate MySQL database server. XAMPP is required for PHP websites, but not for JAVA. However, XAMPP is required for MySQL databases.

- Overleaf

We decided to use Overleaf as the platform to complete our project documentation. It provides a collection of useful templates for various use cases that you can simply open in a new project, or download to use offline. Moreover, it also provides the convenience of an easy-to-use LaTeX editor with real-time collaboration and the fully compiled output produced automatically in the background as you type. The downside is the real-time collaboration feature is a premium feature so we will need to pay a few amount for it which is already stated in our cost estimation section (Refer Table II).

- Google Meet

Like every other app development project, we would need a platform for meeting and discussing our development process. Hence, we decided to use Google Meet platform to conduct meetings every week and discuss about our current development, assignments and future plans.

- KakaoTalk

We decided to use the KakaoTalk chat platform to communicate with each other about meeting time, asking questions and sharing documents on the go.

### B. *Software In Use*

1) Google Map API

Our application will have a map as its main backbone which will show up on the very main page after the user has logged in. So, we decided to use the Google Map API service to implement the map features into our application. The reason for this choice is the API key is not only free, but it is also Android Studio friendly; the Android studio provided various widgets and functions for the developers to manipulate the map such as adding markers, getting user current location, getting the distances between two places and much more.

2) Social Media Login API

Our application will provide an alternate way for the users to log in; Google, Facebook and Twitter Login method. This way, users will not have to undergo the hassle of making a new account before using the application. Furthermore, users who logged in by these alternate methods will have their credentials handled by the respective services instead of our own server which grants them more security and safety.

TABLE III
ROLE ASSIGNMENTS

| **Name** | **Task** |
|---|---|
| **Megat** | |
| **Wan** | |
| **Amin** | |

## IV. SPECIFICATIONS

### A. *Account Creation and Login*

1) Login Page

Whenever a user first launch the application, they will be greeted by the login page of the application (refer Fig. 1). There will be a huge application name ”DOOWA” on top of the page and under it will be 2 text spaces which will be used to receive input from the user for their username and password. For password textbox, the characters inputted will be privated and changes to dotted characters. Under these 2 text spaces, there will be a button to be clicked after the user filled their login credentials into the mentioned text spaces. Additionally, under the button, there will be 2 more smaller buttons, namely ”Forgot password?” and ”Register” which carries their specified task that are explained later .

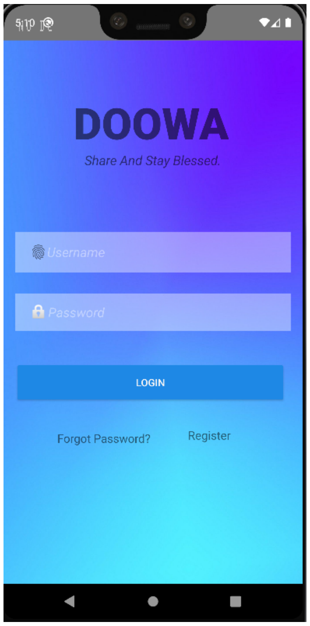
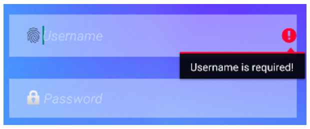


Fig. 1. Login page; first page upon app execution.

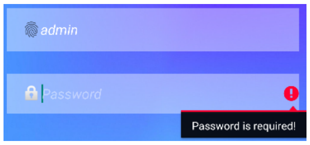
- Empty username and password
  When the ”LOGIN” button is clicked while the username and password are empty, a warning will be displayed onto the respective text box which is currently empty

and requires the user to fill up the text box to remove the warning.



Username is required!

Fig. 2. Username textbox is empty.



Password is required!

Fig. 3. Password textbox textbox is empty.

- Both fields are filled and LOGIN button is clicked

When the user inputted both username and password text boxes and clicked the ”LOGIN” button, the program will use the ”startPut()” method provided by the JAVA Class ”PutData” and send the inputted data to our server. Our server will then will check whether the combination is correct and then the result will be send back to the frontend side and inform the user whether the username and password combination is valid or not. While all of these process are ongoing, a circular loading bar will be shown at the center of the screen indicating the checking process in ongoing (refer Fig.4) . The loading bar will be gone after the checking process is completed successfully. After that, a message will appear the the bottom of the screen indicating whether the login is successful or not.

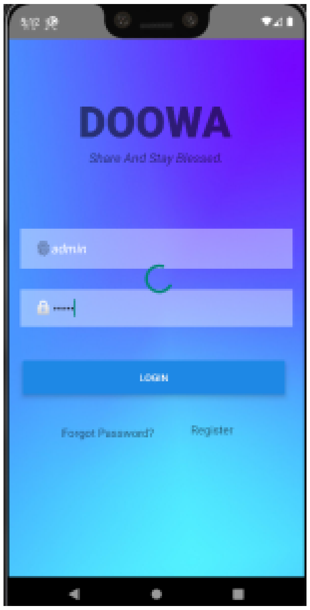
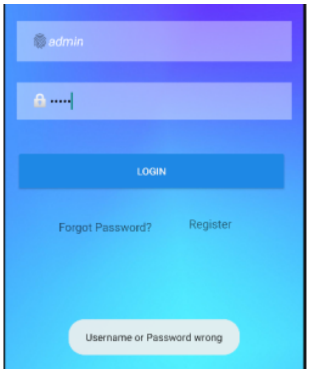


Fig. 4. Loading bar pops up while checking username and password.

- Wrong username and password combination

If the user inputted the wrong combination of username and password, after the LOGIN button is clicked, a message will appear at the bottom of the screen showing ”Username or Password wrong” and the application will stay on the login page until the correct combination is inputted.

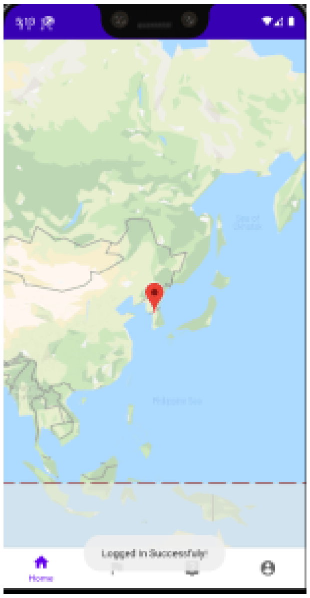


Username or Password wrong

Fig. 5. Wrong username/password.

- Correct username and password combination

If the username and password provided by the user is valid, the user will be able to access the main page of the application. A message also will be displayed at the bottom of the screen saying ”Logged In successfully!”.



Logged In Successfully!

Fig. 6. Correct username/password.

2) User account registration

From the login page, there will be a button called ”Register” which allows the user to create a new account for the first time. On the registration page, there will be 5 text fields for the user to input their details which are full name, username, email, password and password confirmation. Under the fields will be a button ”Register” which will send all the inputted user details to the server when clicked. Under this button, at the bottom of the screen, there will be a text saying ”Already have an account? Log in.”. When users click this text, the application will simply send the user back to the previous login page.

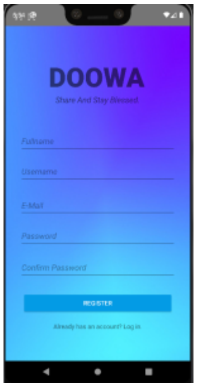
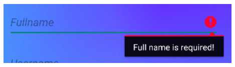


Fig. 7. Registration page.

- Full name

Full name can be any text. If this field is blank when the ”Register” button is clicked, an error will pop up on the field.

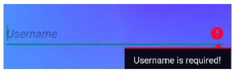


Full name is required!

Fig. 8. Blank full name field error.

- Username

Username can be any text. If this field is blank when the ”Register” button is clicked, an error will pop up on the field.

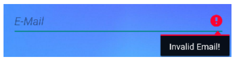


Username is required!

Fig. 9. Blank username field error.

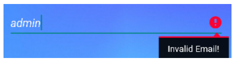
- Email

Users must provide a valid email in this field. If this field is blank or invalid email address is used, an error will pop up on the field.



Invalid Email!

Fig. 10. Blank email field error.

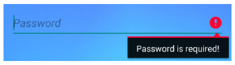


Invalid Email!

Fig. 11. Invalid email error.

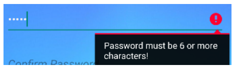
- Password and Confirmation

Users must provide a password that is at least 6 characters long. If this field is blank or invalid password is used, an error will pop up on the field. Same goes to the password confirmation field. If the string entered in both password and password confirmation field are different, an error will pop up on the password confirmation field.



Password is required!

Fig. 12. Blank password field error.

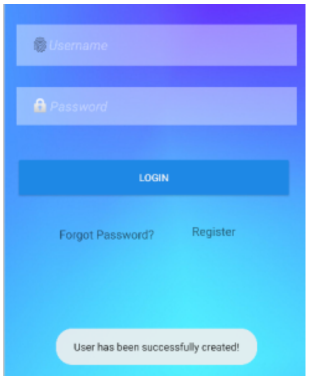


Password must be 6 or more characters!

Fig. 13. Invalid password error.

- Successful Registration

Upon successful registration, user will be sent back to the login page of the application. Additionally, a message saying ” User has been successfully created!” will be shown at the bottom of the screen. Now, user can use the credentials registered just now at the login page.

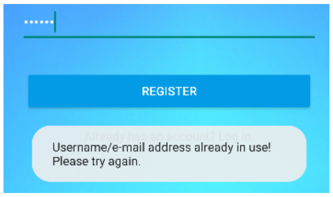


User has been successfully created!

Fig. 14. Successful registration.

- Failed Registration

Failed registration can only be occurred whenever a user tries to register using a username or email address that already has been registered. If such occurs, after clicking the ”REGISTER” button, a message saying ”Username/e-mail address already in use! Please try again.” will be displayed at the bottom of the screen.



Username/e-mail address already in use!
Please try again.

Fig. 15. Failed registration.

3) Password retrieval

Sometimes user might forgot their password from time to time. On the login page, there will be a small clickable text ”Forgot Password?” which can be used by the users to reset their password. Users only need to provide their email address which was used for account registration into the field provided. Under the text field, a button ”SEND EMAIL VERIFICATION” will be provided and whenever clicked, an email containing the hashed code of the user password will be sent to the inputted email. Failure will occur if the field is blank, invalid email format or the email is not found in the account database.

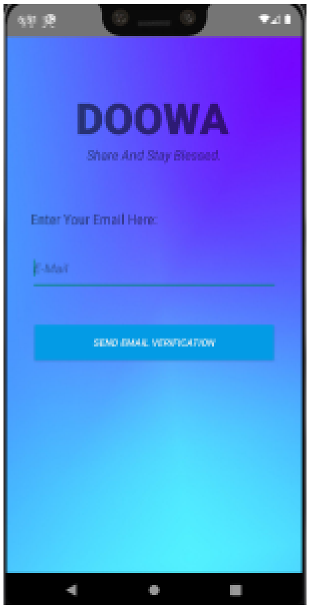


Fig. 16. Password retrieval page.

### *B. Map Services*

1) Implementing Map into Application

Whenever a user logged in into their account, the first thing that should be displayed on the screen is the map which will shows various markers indicating the locations of the people who are requesting donation. Therefore, the most important thing for our application would obviously be implementing map into our application. We decided to use the Google Maps API services because not only it is free, but is is also Android Studio friendly which will be providing various amount of functions and widgets that can be used to manipulate our map interface.

- Using Google Maps API

First we will go to https://console.cloud.google.com/ and click ”Create Project”.

After entering our project name, click the ”Create” button and now our project is finally created in the Google console and ready to be provided with various APIs.

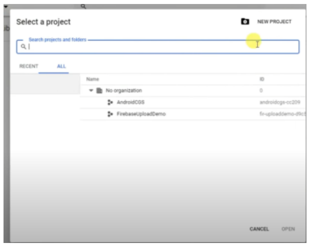


Fig. 17. Create project.

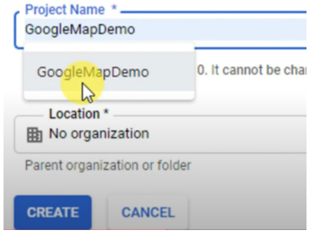
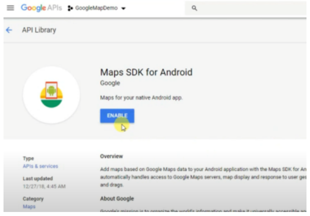


Fig. 18. Enter project name and create.

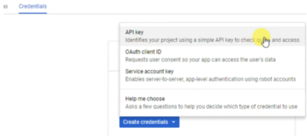
Then, on the search bar, search for ”Maps SDK for Android” and click the ”Enable” button to enable the API service for our project. Click on the ”Credentials” from the tabs above and click on the ”API key” to start creating the API key for our Google Maps. Later, API key will be successfully created and we can copy the key to be pasted into the project manifest file.



Maps for your native Android app.

Add maps based on Google Maps data to your Android application with the Maps SDK for An
automatically handles access to Google Maps servers, map display and response to user ges
and drags.

Fig. 19. Enable Maps SDK for Android.



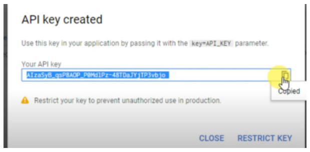
API key
Identifies your project using a simple API key to check quota and access

OAuth client ID
Requests user consent so your app can access the user's data

Service account key
Enables server-to-server, app-level authentication using robot accounts

Help me choose
Asks a few questions to help you decide which type of credential to use

Fig. 20. Create API key.



API key created

Use this key in your application by passing it with the `key=API_KEY` parameter.

Your API key: AIzaSyB_qsP8AOP_P0Md1Pz-48TDaJYjTP3vbjo

Restrict your key to prevent unauthorized use in production.

Fig. 21. Copy API key and paste into project manifest file.

Finally, we can see the map being displayed in our application as the main display whenever user logs in.

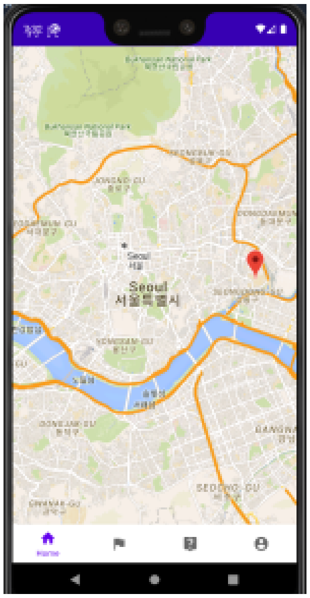


Fig. 22. Main map display.

- Map Markers

On the map, there should be multiple markers that are indicating the location of other users which are requesting donations. These markers has different colours according the urgency of the requester needs. For very urgent requests, they will be indicated with red markers. For moderate urgency, they will have yellow markers and for lowest priority, green marker should be used. Whenever a marker is clicked, a label showing the details of the request such as the name of the requester, the type of donation needed and full address of the location should be displayed. If multiple markers are showing up at a very close distance, the markers should be grouped as one to make it easier for another user to click the overlapping markers.

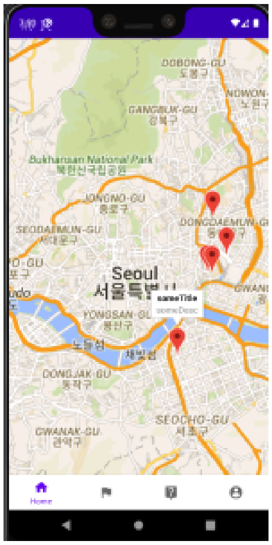


Fig. 23. Multiple markers shown on map.

- Details upon clicking markers

As mentioned before, upon clicking any markers on the map, the application will bring the users to another page that will display all the details of the request such as the full name of the receiver, type of donation requested, time and date of request, and much more. On the page, there will be a call and message button which can be used by the donor to either call or message the receiver. Whenever these buttons are clicked, a pop up will appear at the bottom of the screen, showing multiple choices of applications which the donor prefer to make a call or send a message. Another button with the icon ”navigation” also should be added on the details page. When this button is clicked, the application will launch the Google Maps application to show the location of the marker inside that app which will provide the navigation available to reach the location.

**INSERT UI FOR DETAIL PAGE HERE!!!**

- Marker removed upon completed donation

On the requester side, whenever they are satisfied with the donation arrived, they can click the ”Donation completed” button on their donation request page. Clicking this button will cause the marker of the request location to be removed from the map and database.

### C. Details Page

-online banking
-report button
-chatroom(other messaging app)

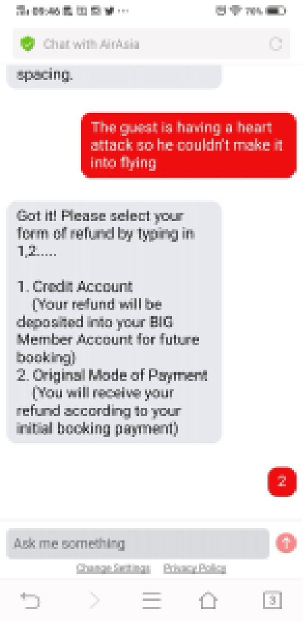
### D. Request Page

-set meeting (request page)
-choose type donation (request page)
-pic upload (request page)
-guideline n manual (request page)

### E. Chatbot

The application should provide a chat bot service to the users which let the users to ask questions and set a reminder.This chat bot should not use an AI approach, but rather a very simple approach where the users just type in the command and arguments and the bot will reply accordingly. The chatbot should have various kind of features and commands that covers all the users’ needs.

At the bottom of the screen, there is a navigation bar to navigate the users to the chat bot page. The user simply have to click the ”Live Help” button to navigate to the chat bot page.



spacing.

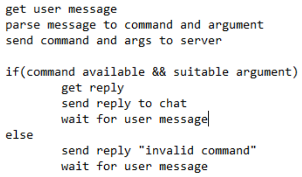
The guest is having a heart attack so he couldn't make it into flying

Got it! Please select your form of refund by typing in 1,2.....

1. Credit Account
   (Your refund will be deposited into your BIG Member Account for future booking)
2. Original Mode of Payment
   (You will receive your refund according to your initial booking payment)

2

Fig. 24. Sample UI for chat bot page.



```
get user message
parse message to command and argument
send command and args to server

if(command available && suitable argument)
        get reply
        send reply to chat
        wait for user message
else
        send reply "invalid command"
        wait for user message
```

Fig. 25. Simple pseudocode for chat bot.

### F. Account Page

-points for donor (account page)
-notification (account page)
-donor rating (account page)
-reminder (account page)
-donor tracker (account page)